City of Visalia

Sewer System Management Plan (SSMP)

Prepared in Compliance with
State Water Resources Control Board Order No. 2022-0103-DWQ
Statewide General Waste Discharge Requirements for Sanitary Sewer Systems

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Chapter 1: SSMP Goal and Introduction

1.1 Goal of the Sewer System Management Plan

The goal of the City of Visalia's Sewer System Management Plan (SSMP) is to provide a plan and schedule to:

1. Properly manage, operate, and maintain all parts of the City's sanitary sewer collection system;
2. Reduce and prevent spills; and
3. Contain and mitigate spills that do occur.

This SSMP provides the framework for effective management of the collection system and compliance with **State Water Resources Control Board Order No. 2022-0103-DWQ**.

1.2 Regulatory Context

The City of Visalia owns and operates a sanitary sewer collection system regulated under the **Statewide Sanitary Sewer Systems General Order 2022-0103-DWQ**. The SSMP describes the City's programs for operating, maintaining, monitoring, and improving the collection system to ensure compliance with the Order.

The SSMP will be implemented by the Public Works Department and updated as needed to reflect regulatory changes, system improvements, and audit findings.

1.3 SSMP Update Schedule

- **Last Audit**: The most recent internal audit covered the period **May 3, 2021 through May 2, 2024**. The audit report was due by **November 2, 2024**, but was not submitted until **August 11, 2025**.
- **Next Audit**: The next internal audit must cover the period **May 3, 2024 through May 2, 2027**, with the audit report due no later than **November 2, 2027**.
- **SSMP Updates**: This SSMP update will be presented to the **Visalia City Council for adoption in 2025** (date TBD). Future SSMP updates will occur at least once every three years, in alignment with internal audit cycles, and will be adopted by the Council in a public meeting.
- **Milestones**: SSMP updates will incorporate activities addressing spill prevention, OERP revisions, Master Plan findings, and CIP project implementation.

1.4 Sewer System Asset Overview

The City of Visalia owns and operates a wastewater collection system located in **Tulare County, California**, serving the incorporated **City of Visalia** and contributing flows from **Goshen, a Census Designated Place (CDP) located northwest of the City**.

- **Population Served**: Approximately **145,000 residents**.
- **Service Boundary**: The City's sewer service area generally coincides with its incorporated city limits, with additional flows received from Goshen.
- **System Size**: The wastewater collection system consists of approximately **493 miles of gravity sanitary sewer pipelines**, ranging in diameter from **4 inches to 48 inches**. The City operates **13 wastewater lift stations** and associated force mains.
- **System Flows**: Wastewater discharges from **residential, commercial, industrial, and other users** are conveyed to the City's **Water Reclamation Facility (WRF)**. Goshen's wastewater is conveyed via a lift station and a **24-inch pipeline** to the WRF.
- **Data Management Systems**: The City maintains an up-to-date GIS-based sewer system map and tracks maintenance activities through a Computerized Maintenance Management System (CMMS).
- **Laterals**: Property owners are responsible for private sewer laterals, while the City maintains the public mainlines.
- **Unique Challenges**: The collection system serves a diverse community with significant **industrial contributions**, requiring a robust pretreatment program and proactive capacity planning.

A complete up-to-date map of the wastewater collection system is maintained in the City's GIS and referenced in **Appendix B** of this SSMP.

Chapter 2: Organization

2.1 Legally Responsible Official

The **Legally Responsible Official (LRO)** for the City of Visalia is the **Public Works Manager**. The LRO has the authority to certify and submit SSO reports in CIWQS to the State Water Resources Control Board.

- **Name**: Benjamin Litwack
- **Title**: Public Works Manager
- **Telephone**: (559) 713-4671
- **Email**: ben.litwack@visalia.city

2.2 Management and Administrative Staff

The following positions are responsible for implementing the SSMP and ensuring compliance with the General Order:

- **Public Works Director** – Nick Bartsch
    - Oversees all divisions within the Public Works Department, including Wastewater Operations.
    - Telephone: (559) 713-4052 | Email: nick.bartsch@visalia.city
- **Public Works Manager (LRO)** – Benjamin Litwack
    - Responsible for SSMP implementation, overall program compliance, and certification of SSO reports.
    - Telephone: (559) 713-4671 | Email: ben.litwack@visalia.city
- **Wastewater Collection Superintendent (CIWQS Data Submitter)** – Rick Paredez
    - Supervises wastewater collection operations and staff.
    - Enters initial SSO data into CIWQS; coordinates field response.
    - Telephone: (559) 713-4273 | Email: rick.paredez@visalia.city
- **Lead Wastewater Maintenance Technicians** – Armand Gonzalez, Mike Demmers
    - Directly supervise crews performing collection system maintenance and emergency response.

- **Senior Wastewater Maintenance Workers** – Cruz Ruiz, Juan Arreola
    - Assist with inspection, cleaning, and field operations.
- **Wastewater Maintenance Workers** – Francisco Serna, Jeff Riley, Ismael Meza
    - Perform day-to-day cleaning, inspection, and repair activities.
- **Maintenance Service Workers** – Hector Rodrigues, Michael Weatherly
    - Support wastewater collections maintenance and response functions.
- **Heavy Equipment Operator** – James Southern Jr.
    - Operates specialized equipment for excavation, pipe replacement, and emergency repairs.

2.3 Organizational Lines of Authority

The organizational chain of command for wastewater collections is as follows:

- **Public Works Director → Public Works Manager (LRO) → Wastewater Collection Superintendent → Lead/Senior Maintenance Technicians → Maintenance Workers/Service Workers/Equipment Operator**

A detailed organizational chart is included in **Appendix H**.

2.4 Chain of Communication for Reporting SSOs

- **During Business Hours**: SSO notifications are received by the **Water Reclamation Facility Operations Control Center** at (559) 713-4403 and dispatched to collection staff.
- **After Hours**: Calls are handled by **Professional Communications Network (PCN)**, which contacts the on-call Wastewater Collections staff.
- **Field Response**: Crews are dispatched to investigate, contain, and mitigate the overflow.
- **Reporting Responsibilities**:
    - **CIWQS Initial Reports**: Entered by the Wastewater Collection Superintendent or designee.
    - **CIWQS Certification**: Performed by the Public Works Manager (LRO).
    - **External Notifications**:

- **Regional Water Quality Control Board** – Notified as required by spill category.
- **California Office of Emergency Services (Cal OES)** – Notified if discharge reaches surface waters.
- **Tulare County Environmental Health** – Notified for potential public health impacts.
- **Property Owners/Public** – Notified where applicable.

Chapter 3: Legal Authority

3.1 Regulatory Requirement

Order No. 2022-0103-DWQ requires that the SSMP demonstrate the Enrollee has sufficient legal authority, through ordinances, service agreements, and/or other legally binding procedures, to regulate, maintain, and enforce the operation of the sanitary sewer system.

3.2 Sewer Use Ordinances

The City of Visalia exercises legal authority over its sewer system through the **Visalia Municipal Code, Chapter 13.08 – Sewer Service System**. This chapter provides the framework for sewer use regulation, discharge prohibitions, design requirements, enforcement, and inspection authority.

👉 Current code available at: Visalia Municipal Code – Chapter 13.08

3.3 Legal Authority Provisions

- **Prevention of Illicit Discharges**
    - Chapter 13.08 prohibits inflow and infiltration (I/I), stormwater inflow, unauthorized industrial/commercial wastewater, chemical dumping, fats/oils/grease (FOG), roots, trash, and other debris.
    - The City regulates industrial discharges through its pretreatment program and enforces FOG requirements for food service establishments.
- **Collaboration with Storm Sewer Agencies**
    - The City coordinates with local stormwater agencies and internal Public Works divisions during SSO response events.
    - Emergency procedures ensure access to storm drains, coordination of containment activities, and prevention of cross-connections.
- **Design and Construction Requirements**
    - All new sewer facilities and connections must be designed and constructed in accordance with the **City of Visalia Standard Specifications and Design Standards**.
    - The City requires inspection and approval of sewer installations prior to acceptance.
- **Access for Maintenance and Inspection**

    - The Municipal Code grants City staff authority to inspect and maintain sewer system facilities.
    - Property owners must provide access to public sewer facilities, including the public portion of sewer laterals, for maintenance and inspection.
- **Enforcement of Violations**
    - The City has enforcement authority to issue notices of violation, administrative penalties, service restrictions, or termination of service for non-compliance.
    - Enforcement applies across residential, commercial, and industrial users.
- **Easement Accessibility**
    - Easements are required for sewer facilities located on private property.
    - The City secures and records easements to ensure continued access for operation, maintenance, and emergency response.

3.4 Service Agreements

The City maintains agreements with contributing satellite systems, which are updated periodically. These agreements outline flow conditions, responsibilities, and compliance expectations. (Note: the agreement with **Goshen Community Services District** is currently under renegotiation and will be incorporated once finalized.)

3.5 Summary

Through its Municipal Code, Standard Specifications, and easement practices, the City of Visalia possesses the legal authority to:

- Prevent illicit discharges into the collection system;
- Coordinate with storm sewer agencies during emergency events;
- Regulate design and construction of sewer infrastructure;
- Ensure access to public portions of sewer laterals for inspection and maintenance;
- Enforce violations of ordinances and service agreements; and
- Secure easements for sewer system operations and maintenance.

This framework ensures the City maintains adequate legal authority to comply with **Order No. 2022-0103-DWQ**.

Chapter 4: Operation and Maintenance Program

4.1 Updated Map of Sanitary Sewer System

The City of Visalia maintains an up-to-date **Geographic Information System (GIS)** database of the wastewater collection system. The GIS includes:

- Gravity sewer pipelines with diameter and material attributes
- Manholes
- Pump stations (13 total)
- Pressure pipes and valves
- Stormwater conveyance facilities within the service area

The GIS is updated whenever new facilities are constructed, modified, or abandoned. Access to the GIS and supporting maps is available to **State and Regional Water Board staff** upon request.

A current system map illustrating gravity line segments, manholes, pumping facilities, pressure pipes, and stormwater conveyance facilities is provided in **Appendix B** of this SSMP.

4.2 Preventive Operation and Maintenance Activities

The City conducts preventive maintenance using a **Computerized Maintenance Management System (CMMS)** to schedule, track, and document work performed by both City staff and contractors.

Preventive maintenance activities include:

- **Gravity Sewer Main Cleaning**: Systematic cleaning based on a preventive schedule. Problem areas are cleaned at higher frequency.
- **Hot Spot Program**: Sewer mains with histories of blockages or SSOs (including tree root intrusion areas) are placed on an increased cleaning cycle.
- **CCTV Inspections**: Closed-circuit television (CCTV) inspections are performed on a scheduled basis and after SSOs to assess structural and maintenance conditions.
- **Manhole Inspections**: Manholes are inspected for inflow/infiltration, corrosion, structural damage, and obstructions.
- **Lift Station Inspections**: Inspected twice weekly for pump function, alarms, electrical systems, and wet well condition.

All inspection and maintenance data is logged in the CMMS, which tracks:

- Areas prone to root intrusion or recurring blockages
- Locations with structural defects
- Completion of scheduled tasks vs. emergency work

4.3 Training

The City provides ongoing training for wastewater collection staff, including in-house sessions, external courses, and practice drills. Training topics include:

- **General Order Requirements**: Review of Order No. 2022-0103-DWQ provisions.
- **Spill Emergency Response Plan**: Procedures for responding to SSOs, including practice drills and safety training.
- **Spill Volume Estimation**: Field operators receive training in consistent methods for estimating SSO volume.
- **CIWQS Reporting**: Staff responsible for data entry are trained in CIWQS reporting procedures, while the Public Works Manager (LRO) maintains certification authority.
- **Confined Space Entry, Equipment Operation, and Safety**: Training ensures staff remain qualified for field operations.

Training records are maintained and updated annually.

4.4 Equipment Inventory

The City maintains a detailed inventory of wastewater collections equipment, including vehicles, pumps, trailers, bypass systems, and specialized maintenance tools.

The complete **Wastewater Collections Equipment Inventory (2025)** is included in **Appendix E** of this SSMP. This appendix identifies:

- **Critical Equipment**: Combination jet/vac trucks, CCTV inspection van, portable pumps, generators, and bypass piping.
- **Replacement and Spare Parts**: Pump motors, manhole covers, plugs, and safety equipment.
- **Support Equipment**: Heavy equipment (excavator, backhoe, skid steer, dozer), trailers, compressors, and service vehicles.

4.5 Summary

The City of Visalia's Operation and Maintenance Program includes up-to-date GIS mapping, a preventive maintenance schedule supported by a CMMS, comprehensive staff training, and a robust equipment inventory. Together, these elements ensure that the City effectively manages its wastewater collection system, minimizes SSOs, and maintains compliance with **Order No. 2022-0103-DWQ**.

Chapter 5: Design and Performance Provisions

5.1 Updated Design Criteria and Construction Standards and Specifications

The City of Visalia requires that all new sanitary sewer system components — including pipelines, manholes, pump stations, and appurtenances — be designed, constructed, repaired, and rehabilitated in accordance with the **City of Visalia Standard Specifications** and the **City of Visalia Design and Improvement Standards**.

Key provisions include:

- **Hydraulic Capacity**: Pipelines and pump stations must be designed to convey peak dry weather flows and peak wet weather flows consistent with the City's Master Plan and industry standards (e.g., Ten States Standards, ASCE guidelines).
- **Materials and Installation**: All materials (pipe, manholes, force mains, valves) must meet ASTM and AWWA standards, and be installed per the City's governing standards.
- **Pump Stations**: Pump station design criteria include redundancy (at least two pumps), emergency backup power or bypass pumping capability, and SCADA alarm notification.
- **New Development**: Developers are required to design and construct sewer facilities to City standards at their expense, subject to City review and approval.
- **Rehabilitation**: Repair and rehabilitation projects are designed to restore hydraulic capacity, address structural deficiencies, and extend service life.

If deficiencies are identified in existing design criteria, component-specific evaluations (hydraulic modeling, flow monitoring, CCTV inspections) are used to verify capacity and inform updated standards.

5.2 Procedures and Standards

The City has established procedures and standards for the inspection and testing of newly constructed, installed, repaired, or rehabilitated sewer facilities, including:

- **Pipeline Testing**: New and rehabilitated pipelines are subject to low-pressure air testing, deflection testing, and CCTV inspection prior to acceptance.
- **Manhole Testing**: New and rehabilitated manholes are tested for watertightness using vacuum testing.
- **Pump Station Start-Up**: Newly constructed or rehabilitated pump stations undergo start-up testing, wet well drawdown testing, and verification of alarms and backup systems.

- **Material Certification**: Contractors must submit material certifications verifying compliance with City standards and approved submittals.
- **Inspection Oversight**: All construction and rehabilitation work is inspected by City Public Works inspectors to ensure adherence to the **City of Visalia Standard Specifications** and the **Design and Improvement Standards**.

5.3 Summary

The City of Visalia ensures that its sanitary sewer system is properly designed, constructed, and maintained through the **Standard Specifications** and **Design and Improvement Standards**, coupled with rigorous inspection/testing procedures. These provisions ensure system components meet hydraulic capacity requirements, protect infrastructure integrity, and maintain compliance with **Order No. 2022-0103-DWQ**.

5.4 Engineering General Design Standards

The City's **Standard Specifications (Appendix I)** and **Design and Improvement Standards (Appendix J)** contain detailed requirements for the design, construction, and improvement of sanitary sewer facilities. Certain provisions from the **2008 specifications** remain in effect where the 2013 updates did not address specific criteria. Key standards are summarized below.

5.4.1 Minimum Pipe Cover

- **Details E-1 and E-2 of the Design and Improvement Standards** specify a **minimum pipe cover of 2.0 feet**.
- If the minimum cover cannot be achieved, **pipe encasement** is required.
- Sewer depths must also be sufficient to allow for proper installation of sewer laterals where applicable.

5.4.2 Manholes

- Manhole requirements are established in the **Design and Improvement Standards (Details S-1 through S-6)**, the **2008 Standard Specifications (Section 19 – Sewer and Storm Drain Structures)**, and the **2013 Standard Specifications (Section 29 – Storm Drainage and Sanitary Sewer Facilities)**.

- These standards address manhole construction, frame and cover requirements, spacing, drop connections, and watertightness.
- While the 2013 Standard Specifications contain updated provisions (Section 29), the 2008 Standards and Specifications remain applicable for certain facilities constructed under those criteria, and are therefore retained in this SSMP for reference.

5.4.3 Lift Stations

- Lift station requirements are defined in the **Design and Improvement Standards (Detail S-13)** and the **2008 Standard Specifications (Section 20 – SEWER PUMP STATION)**.
- These provisions specify design requirements for wet well sizing, pump redundancy, backup power, alarm systems, and access for maintenance.
- The 2013 Standard Specifications did not include updated provisions for lift stations. As a result, the 2008 standards remain the controlling references for lift station design and construction until superseded.

5.4.4 Minimum Pipe Slope

- **Section 17 of the 2008 Standard Specifications** establishes the minimum slopes for sewer pipe sizes.
- These criteria remain in effect because the most recent specification document does not include slope requirements.
- The slopes ensure adequate flow velocities to minimize solids deposition and maintain self-cleansing conditions within the collection system.

Table 5-1: Minimum Pipe Slopes

Pipe Size (in)	Minimum Slope (%)
6	0.35
8	0.24
10	0.18
12	0.14

Source: City of Visalia 2008 Standard Specifications, Section 17

Chapter 6: Spill Emergency Response Plan

6.1 Overview

The City of Visalia maintains an up-to-date **Spill Emergency Response Plan (SERP)** to ensure prompt detection and response to sanitary sewer overflows (SSOs). The SERP outlines procedures to minimize spill volume, protect public health, and mitigate environmental impacts. The SERP is included in **Appendix C** of this SSMP.

6.2 Spill Notification Procedures

- **Primary Responders**: All SSOs are reported immediately to the **Wastewater Collection Superintendent** and the **Public Works Manager (LRO)**.
- **Call Intake & Dispatch**:
    - **Business hours**: Calls are received by the **Water Reclamation Facility Operations Control Center** at (559) 713-4403 and dispatched to collections crews.
    - **After hours**: Calls are received by **Professional Communications Network (PCN)** (City's contracted 24-hour answering service), which notifies the on-call wastewater collections staff.
- **Local Officials**: **Tulare County Environmental Health** and other local officials are notified as required by spill category and potential public health impacts.
- **Regulatory Agencies**: The **State and Regional Water Boards** are notified via CIWQS within the timeframes in **Order No. 2022-0103-DWQ**. **Cal OES** is notified if any discharge reaches surface waters.
- **Other Entities**: Potentially affected **water suppliers, health agencies, and adjacent jurisdictions** are notified when impacts may extend beyond City boundaries.

6.3 Compliance with Reporting Requirements

The City complies with all notification, monitoring, and reporting requirements of the **General Order**, State law, and applicable Regional Water Board Orders, including CIWQS initial and certified reports and water quality monitoring when required.

6.4 Roles and Responsibilities

- **Field Crews**: Contain/mitigate spills, implement traffic control, and clean impacted areas.

- **Superintendent/On-Call Lead**: Directs response, initiates notifications, and ensures documentation.
- **Public Works Manager (LRO)**: Certifies CIWQS reports.
- **Contractors**: Mobilized as needed for pumping, hauling, or cleanup.

6.5 Spill Response Procedures

Dispatch promptly; establish site safety and traffic control; maintain emergency system operations (e.g., bypass pumping); contain to protect storm drains and waters of the State; remove sewage from conveyances; clean areas without impacting beneficial uses; document all actions.

6.6 Interagency Coordination

Pre-planned coordination with the **stormwater division** and other utilities supports rapid containment, access to storm drains, and prevention of cross-connections during spill events.

6.7 Post-Spill Activities

Conduct post-spill assessment, prepare documentation (photos, logs, CIWQS reports), and implement remediation to minimize public health impacts and restore beneficial uses.

6.8 Review and Improvement

The Spill Emergency Response Plan is reviewed **annually** and updated as needed based on drills, after-action reviews, technology, equipment, and interagency coordination improvements.

Chapter 7: Sewer Pipe Blockage Control Program

7.1 Program Evaluation

The City of Visalia has evaluated its sanitary sewer system and determined that a **Sewer Pipe Blockage Control Program is needed** to reduce blockages associated with **fats, oils, grease (FOG), rags, and debris**. The City experiences FOG-related buildup in portions of the system, primarily in commercial areas with high concentrations of food service establishments (FSEs), as well as rags and debris in certain residential and commercial areas.

The City's program combines **public education**, **source control**, **inspections and enforcement**, and **increased maintenance** in high-risk segments to reduce blockages and prevent SSOs.

7.2 Public Education and Outreach

The City implements a **public education and outreach program** to promote proper disposal of FOG and other pipe-blocking substances:

- **FSE Outreach**: Distribution of best management practice (BMP) materials during inspections, including posters and fact sheets on proper grease disposal.
- **Residential Outreach**: Periodic mailers, utility bill inserts, and City website content educating residents about not disposing of wipes, rags, and cooking grease down household drains.
- **Implementation Schedule**: Outreach is ongoing year-round, with annual review and updates prior to the next fiscal year.

7.3 Disposal of Pipe-Blocking Substances

- **FOG Disposal**: FSEs are required to clean grease control devices and dispose of waste grease and solids at **approved rendering or grease recycling facilities**.
- **Debris and Rags**: Debris collected during cleaning and maintenance is transported to the City's Water Reclamation Facility for disposal.
- **Planning for Additional Facilities**: The City periodically evaluates disposal options to ensure adequate facilities remain available for the service area.

7.4 Legal Authority

The City's **Municipal Code Chapter 13.08** prohibits the discharge of FOG, debris, rags, and other materials in quantities that may cause blockages, requires the installation and maintenance of grease removal devices, and authorizes inspections and enforcement.

7.5 Grease Removal Devices and Standards

- **Requirements**: Food Service Establishments must install **grease removal devices** (e.g., traps or interceptors) sized and designed per the **City of Visalia Design and Improvement Standards**.
- **Maintenance**: Grease control devices must be cleaned regularly to prevent accumulation.
- **BMPs and Recordkeeping**: FSEs must maintain BMP practices and records of cleaning and disposal.
- **Inspections**: Inspectors verify the presence, proper maintenance, and recordkeeping for these devices during annual inspections.

7.6 Inspection and Enforcement Authority

- The City has **authority to inspect grease-producing facilities**, issue notices of violation, and take enforcement action if necessary.
- All **FSEs are inspected at least annually**, with follow-up inspections for noncompliance.
- Staffing: The City has dedicated wastewater collections staff trained to conduct FOG inspections and enforce program requirements.

7.7 Identification of Problem Areas

The City maintains a **hot spot cleaning list** that identifies sewer segments subject to **FOG, rag, or debris-related blockages**. These areas are identified through:

- CCTV inspections,
- Review of SSO history,
- Field crew observations, and
- Data in the City's CMMS system.

7.8 Cleaning Schedule for Problem Areas

- Identified hot spots are placed on **increased cleaning frequencies**, typically ranging from **monthly to quarterly**, depending on severity.
- Cleaning schedules are tracked and managed through the City's CMMS.

7.9 Source Control Measures

For each area identified with chronic blockages, the City implements **targeted source control measures**, including:

- Focused outreach to upstream FSEs,
- More frequent inspections,
- Enforcement actions where necessary, and
- Evaluation of contributing laterals or private systems for illicit discharges.

7.10 Program Evaluation

The City evaluates the effectiveness of the Sewer Pipe Blockage Control Program annually by reviewing:

- SSO frequency and causes,
- Hot spot cleaning results,
- Inspection and enforcement data, and
- Public outreach outcomes.

Program modifications are made as necessary to ensure effectiveness and compliance with **Order No. 2022-0103-DWQ**.

7.11 Supporting Materials

Forms, BMP handouts, inspection templates, and enforcement examples are included in **Appendix D – FOG Program Supporting Materials**.

Chapter 8: System Evaluation, Capacity Assurance and Capital Improvements

8.1 System Evaluation and Condition Assessment

The City of Visalia conducts **routine evaluation and assessment of its sanitary sewer system** to maintain system reliability, identify deficiencies, and prioritize maintenance and capital improvements.

The City utilizes a combination of **CCTV inspection**, **manhole inspections**, **field observations**, and **hydraulic modeling data** to evaluate the condition of the collection system.

- **Condition Assessment Methods**:
    - **CCTV Inspections** are used to assess the interior condition of sewer mains, identify structural defects, root intrusion, infiltration and inflow (I&I) sources, debris accumulation, and other maintenance issues.
    - **Manhole Inspections** are performed to evaluate structural condition, hydraulic performance, and evidence of surcharge or infiltration.
    - **Visual and Field Observations** are documented by maintenance crews during routine cleaning, hot spot maintenance, and response to service calls.
- **Annual Assessment Targets**:
  Priority is given to **high-consequence areas**, including:
    - Pipelines adjacent to surface waters or in steep terrain;
    - Areas with high groundwater elevations or environmentally sensitive features;
    - Areas near waterbodies with bacterial impairments listed under **Clean Water Act Section 303(d)**.
- **Climate Change Vulnerability**:
  As part of condition assessments, the City evaluates assets for vulnerability to **climate change impacts**, including increased storm intensity and frequency, localized flooding, and power disruption events.
- **Recordkeeping**:
  All inspection and evaluation data are documented and maintained in the **City's GIS and CMMS systems**, providing a long-term record of system condition and trends.

8.2 Capacity Assessment and Design Criteria

The City has established **procedures to identify system components experiencing or contributing to spills caused by hydraulic deficiencies or limited capacity**. These assessments consider:

- **Dry-Weather Peak Flow Conditions** that contribute to surcharge or SSOs.
- **Wet Weather and Design Storm Events** that cause increased I&I or capacity exceedances.
- **Major Sources Contributing to Peak Flows**, such as specific basins with known I&I issues or upstream developments.

The City's **hydraulic modeling and master planning** programs evaluate the capacity of key system elements, including:

- Gravity mains and trunk sewers;
- Force mains and pump stations;
- Interceptors serving growth areas;
- Flood-prone segments subject to elevated I&I under both current and projected storm conditions.

Capacity assessments use data from **system inspections, spill history, and flow monitoring**, and account for **future conditions**, including **climate change** effects such as higher-intensity storm events and increased erosive forces in nearby streams.

The **design criteria** used to size new and replacement infrastructure are contained in the **City's Standard Specifications and Design and Improvement Standards** (see **Appendices I–L**) and include required **redundancy for pumping and storage capacities**.

8.3 Prioritization of Corrective Action

Findings from system condition and capacity assessments are used to **prioritize corrective actions** based on:

- **Severity of deficiencies** and likelihood of causing SSOs;
- **Environmental consequences** (e.g., proximity to surface waters, sensitive areas);
- **Public health and service impacts**; and
- **Cost-effectiveness and integration with planned capital projects**.

Priority actions may include **targeted maintenance**, **rehabilitation**, **I&I reduction programs**, or **capital upgrades**. The prioritization process is integrated with both the **CIP development cycle** and day-to-day operations planning.

8.4 Capital Improvement Plan

The City maintains a **Capital Improvement Plan (CIP)** that serves as the implementation mechanism for major rehabilitation, replacement, and capacity improvement projects.

The CIP includes:

- **Project Schedules and Completion Dates**: Each project includes estimated design, bid, and construction timelines.
- **Funding Sources**: Identified internal (e.g., sewer enterprise fund) and external funding (e.g., grants, loans) for each project.
- **Coordination**: Close coordination between **Operations and Maintenance staff** and **Engineering staff/consultants** during planning, design, and construction phases ensures constructability and operational compatibility.
- **Interagency Coordination**: Projects are coordinated with **other utility agencies** and jurisdictions to minimize conflicts and take advantage of joint opportunities (e.g., road work coordination).

Relevant CIP documentation is included in **Appendix F**.

Chapter 9: Monitoring, Measurement, and Program Modifications

9.1 Adaptive Management Overview

The City of Visalia implements an **Adaptive Management approach** to evaluate and continuously improve the Sewer System Management Plan (SSMP). This approach ensures that all Plan elements remain effective, data-driven, and aligned with operational realities and regulatory requirements under **Order No. 2022-0103-DWQ**.

The City maintains records, monitors performance, and reviews findings from audits and daily operations to identify opportunities for improved performance, spill prevention, and program efficiency.

9.2 Maintaining Relevant Information

The City collects and maintains relevant information to evaluate and improve the SSMP, including:

- **Internal audit findings** and follow-up corrective actions;
- **SSO data**, including cause, volume, and location trends;
- **Preventive maintenance records** (cleaning, CCTV, inspection frequencies);
- **Training and safety records** for field staff; and
- **CIP progress reports** related to sewer system upgrades and rehabilitation.

This information is used to establish and prioritize SSMP activities and to guide updates to policies, staffing, and resource allocation.

9.3 Monitoring and Measuring Program Effectiveness

Each SSMP element is monitored and evaluated for effectiveness through a combination of:

- **Performance metrics**, including SSO frequency, response times, and preventive-maintenance completion rates;
- **Review of program implementation**, such as FOG inspections, condition assessments, and training compliance;
- **Trend analysis** of spill data to identify recurring problem areas; and
- **Assessment of preventive O&M activities**, comparing actual cleaning and inspection frequencies against planned schedules.

The Wastewater Collections Superintendent and Public Works Manager jointly review these data at least annually to determine whether SSMP goals are being met and to identify areas needing improvement.

9.4 Assessment of Preventive Operation and Maintenance Activities

The success of preventive operation and maintenance activities is assessed through:

- Tracking the **reduction of blockages and SSOs** over time;
- Evaluating **maintenance effectiveness** by comparing inspection results before and after cleaning; and
- Reviewing **crew productivity and equipment performance** data stored in the City's CMMS.

These evaluations help determine if maintenance frequencies or methods require adjustment.

9.5 Plan Updates and Program Modifications

Based on monitoring results and performance evaluations, the City updates Plan procedures and activities as appropriate.
Plan modifications may result from:

- Internal audit recommendations;
- New or revised regulatory requirements;
- Implementation of new technologies;
- Organizational changes or resource adjustments; or
- Lessons learned from significant SSO events.

All revisions are documented and incorporated into the SSMP during the next update cycle or sooner if warranted.

9.6 Spill Trend Identification and Analysis

The City maintains a historical record of all SSOs and analyzes the data to identify **spill frequency, location, and estimated volume trends**. These trends are used to:

- Target recurring problem areas for additional cleaning, inspection, or rehabilitation;
- Prioritize capital projects and O&M funding; and

- Measure the long-term effectiveness of preventive and corrective actions.

Trend analyses are incorporated into the City's internal audit reports and annual performance summaries.

9.7 Continuous Improvement Cycle

The Adaptive Management process functions as a **continuous improvement loop**:

1. **Collect and analyze data** from operations, maintenance, and compliance activities;
2. **Evaluate performance and identify gaps** in SSMP implementation;
3. **Prioritize and implement improvements** through operational changes or capital projects; and
4. **Reassess effectiveness** during the next monitoring or audit cycle.

This structured process ensures that the SSMP remains a living document that evolves with the City's operational experience and regulatory framework.

Chapter 10: Internal Audits

10.1 Purpose

The City of Visalia conducts **internal audits** of its Sewer System Management Plan (SSMP) to ensure ongoing compliance with **Section 5.4 (Sewer System Management Plan Audits)** of **Order No. 2022-0103-DWQ**.
These audits verify that all elements of the SSMP are implemented effectively, remain appropriate to the size, complexity, and performance of the City's sanitary sewer system, and support continual improvement.

10.2 Audit Procedures

The City's internal audit procedures are designed to be **proportionate to system size and performance history** and include the following steps:

1. **Preparation and Scope Definition**
    - Review prior audit findings, SSO data, and performance metrics to define the audit focus areas.
    - Establish the audit period and identify relevant SSMP elements to be reviewed.
2. **Review of Program Implementation**
    - Evaluate the implementation and effectiveness of each SSMP element, including documentation, maintenance records, training logs, and inspection data.
    - Verify compliance with current regulatory requirements and City policies.
3. **Performance Evaluation**
    - Assess how effectively preventive operation and maintenance programs, spill response, capacity management, and other core SSMP activities are functioning.
    - Identify areas of non-conformance, inefficiency, or needed procedural updates.
4. **Findings and Recommendations**
    - Document all findings, corrective actions, and recommendations for improvement.
    - Assign responsibilities and timelines for implementing corrective measures.
5. **Reporting and Certification**
    - Prepare an **Internal Audit Report** summarizing results and actions taken.

- The report is reviewed by the **Public Works Director** and certified by the **Public Works Manager (Legally Responsible Official)**.

10.3 Audit Frequency

Internal audits are conducted **at least once every three years**, consistent with the General Order. Additional audits may be performed sooner if significant system changes, major SSOs, or regulatory revisions occur.

10.4 Audit Team

The audit is performed by personnel **independent of daily operations** to maintain objectivity. Typically, the **Public Works Manager** and **Wastewater Collections Superintendent** lead the audit with support from **Engineering** and **Compliance** staff as needed.

10.5 Documentation and Recordkeeping

Completed audit reports are maintained for at least **five years** and included in **Appendix A – SSMP Audit Reports**.
Audit results are used to inform Plan modifications, CIP prioritization, and training needs.
A summary of findings and updates is presented to the **Visalia City Council** during SSMP adoption or update proceedings.

Chapter 11: Communication Program

11.1 Overview

The City of Visalia maintains procedures for effective communication with the **public**, **regulatory agencies**, and **owners or operators of systems connected to the City's sanitary sewer system**, as required by **Order No. 2022-0103-DWQ**.
These procedures ensure transparency, timely notifications, and coordination of operations, maintenance, and capital improvements that affect shared infrastructure.

11.2 Communication with the Public

11.2.1 Spill Notifications

The City notifies the public of **spills or discharges** that:

- Result in closures of public areas, including parks, roadways, or recreational facilities; or
- Enter a **source of drinking water** or pose a potential public health risk.

Notifications are made through one or more of the following:

- Public notices or press releases coordinated with **Tulare County Environmental Health** and **Cal OES**;
- Updates posted on the **City of Visalia website** and social media accounts; and
- On-site signage or barriers warning the public to avoid affected areas.

11.2.2 Public Involvement in SSMP Development and Updates

The public is provided opportunities to review and comment on the **development, implementation, and updates** of the Sewer System Management Plan (SSMP).

- SSMP updates and audit findings are presented to the **Visalia City Council** at public meetings, which are noticed in accordance with the **Brown Act**.
- Members of the public may submit written or verbal comments prior to Council action.
- The current SSMP and internal audit reports are available to the public through the **City's website** and at the **Public Works Department** during business hours.

11.3 Communication with Connected Systems

The City coordinates with **owners and operators of systems that connect to the City's collection system**, including the **Goshen Community Services District (GCSD)** and other industrial or private connections.

This coordination includes:

- **Operational Communication:** Notification of planned or emergency activities that could impact connected flows or service reliability.
- **Maintenance Coordination:** Scheduling of joint maintenance, inspections, or repairs where infrastructure interconnects.
- **Capital Improvement Coordination:** Sharing information on capital projects that may affect flow routing, capacity, or service boundaries.

The City maintains open communication channels with connected system operators to ensure consistent performance and compliance across system interfaces.

11.4 Program Review and Updates

The Communication Program is reviewed during each triennial SSMP audit and updated as necessary to reflect improvements in public notification procedures, communication technologies, or changes in interagency coordination agreements.

Table of Appendices		
Appendix	**Title**	**Contents / Description**
Appendix A	**SSMP Audit Reports**	Includes the most recent (2025) internal audit and prior audit reports, if available. Also includes the standard Internal Audit Report template and checklist used for future cycles.
Appendix B	**Sewer System Map**	GIS-generated map showing the City's sanitary sewer collection system, including gravity mains, manholes, force mains, and 13 lift stations. Contains a metadata statement and date of data accuracy.
Appendix C	**Spill Emergency Response Plan (SERP)**	Comprehensive procedures for spill response, notification, containment, cleanup, and post-spill assessment. Includes callout flowchart, field response forms, and reporting templates.
Appendix D	**Sewer Pipe Blockage Control / FOG Program Supporting Materials**	Food Service Establishment inspection forms, FOG best management practices (BMP) sheets, and sample enforcement documents.
Appendix E	**Operations and Maintenance Resources**	Wastewater Collections equipment inventory (2025), critical spare parts list, and maintenance schedule summaries.
Appendix F	**Capital Improvement Program (CIP) References**	Extracts from the City's current wastewater-related CIP, including project descriptions, schedules, and funding sources for collection system improvements.
Appendix G	**SSMP Adoption Record**	Documentation of City Council approval and adoption of the 2025 SSMP, including the staff report, agenda summary, and meeting minutes excerpt.

Appendix H	**Organizational Structure**	2025 Public Works organizational chart identifying the Director, Public Works Manager (LRO), Wastewater Collections Superintendent, leads, and staff. Includes a communication flowchart for SSO reporting and SSMP implementation.
Appendix I	**City of Visalia Standard Specifications (2008 and 2013 Combined)**	Consolidated reference of relevant Standard Specification sections, including:
		• Section 17 – Minimum Slopes
		• Section 19 – Sewer and Storm Drain Structures
		• Section 20 – Lift Station Standards
		• Section 29 – Storm Drainage and Sanitary Sewer Facilities (2013 Update).
Appendix J	**City of Visalia Engineering Design and Improvement Standards (2016)**	The City's most recent adopted Design and Improvement Standards, containing current criteria for the design, construction, and rehabilitation of sanitary sewer facilities.

Sewer System Management Plan (SSMP) Internal Audit Report

City of Visalia
Compliance with State Water Resources Control Board Order No. 2022-0103-DWQ

1. Executive Summary

This internal audit evaluates the implementation and effectiveness of the City of Visalia's Sewer System Management Plan (SSMP) in compliance with Order No. 2022-0103-DWQ. The audit was conducted by the Public Works Manager and the Wastewater Collections Superintendent, with support from engineering and compliance staff as needed.

2. Audit Period and Team

Audit Period: 7/1/2025 to 8/10/2025
Audit Team:
- Ben Litwack, Public Works Manager
- Rick Paredez, Wastewater Collections Superintendent

3. Methodology

Each of the eleven SSMP elements were reviewed for implementation status, effectiveness, and compliance with the General Order. Historical SSO data from CIWQS and internal records were evaluated. Engineering and compliance staff were consulted as needed for technical clarifications.

4. Element-by-Element Findings

1. Goals

Status: Needs Update

Summary of Review: The "Goals" chapter still references the previous Order No. 2006-0003. The definitions still reference spill categories from the previous order.

Recommended Actions: Spill categories should be updated and the newer order no. 2022-0103-DWQ should be referenced.

2. Organization

Status: Needs Update

Summary of Review: Both personnel and organizational structure have changed since the last SSMP was created.

Recommended Actions: Updated organizational structure and personnel with current staff and positions.

3. Legal Authority

Status: Needs Update

Summary of Review: References old general order. Municipal code references are still current.

Recommended Actions: Update to reference new general order.

4. Operations and Maintenance Program

Status: Needs Update

Summary of Review: Mentions that City facilities consist of 6" – 42" diameter pipe. System now has 48" diameter pipe as well. Parts and inventories list is out of date.

Recommended Actions: Need to update to reflect current conditions and equipment/inventories.

5. Design and Performance Provisions

Status: Needs Update

Summary of Review: References old general order and old City standards and specifications.

Recommended Actions: Update to reference newer general order. Update to current City standards and specifications where feasible or specify 2008 document is referenced. Not all of the items referenced in the chapter carried over to the current standards.

6. Overflow Emergency Response Plan

Status: Needs Update

Summary of Review: References old general order. References different non-business hours call center. References inclusion of Overflow Emergency Response Plan as an appendix but does not include it.

Recommended Actions: Needs to be updated to reference newer general order and current call center. Attach Overflow Emergency Response Plan

7. FOG Control Program

Status: Needs Update

Summary of Review: References old general order. Update needed in 8.8.1 to note that FSE's are now routinely inspected whether or not a blockage or overflow in the sanitary sewer has occurred.

Recommended Actions: Need to update to reference newer general order and current FSE inspection practices.

8. System Evaluation and Capacity Assurance Plan

Status: Needs Update

Summary of Review: References old general order. Does not mention that a new master plan is being developed.

Recommended Actions: Update to reference newer general order and mention that a new master plan is being developed.

9. Monitoring, Measurement, and Program Modifications

Status: Needs Update

Summary of Review: References old general order

Recommended Actions: Update to reference new general order.

10. SSMP Program Audits

Status: Needs Update

Summary of Review: References old general order.

Recommended Actions: Update to reference new general order.

11. Communication Program

Status: Needs Update

Summary of Review: References old general order.

Recommended Actions: Update to reference new general order. Should mention that public hearing will be held once SSMP is updated.

5. Summary of Recommended Updates

Since the SSMP was last updated in 2012 and all elements reference an old general order, an update will need to be made to reflect the new general order. Updates will also need to be made to reflect changes in organizational structure, personnel, equipment, and inventories. There have been no Sanitary Sewer Overflows from City-owned facilities since the SSMP was implemented so the plan appears to have been effective.

The SSMP will be updated in August of 2025 and brought to City Council for approval in September of 2025.

6. Certification

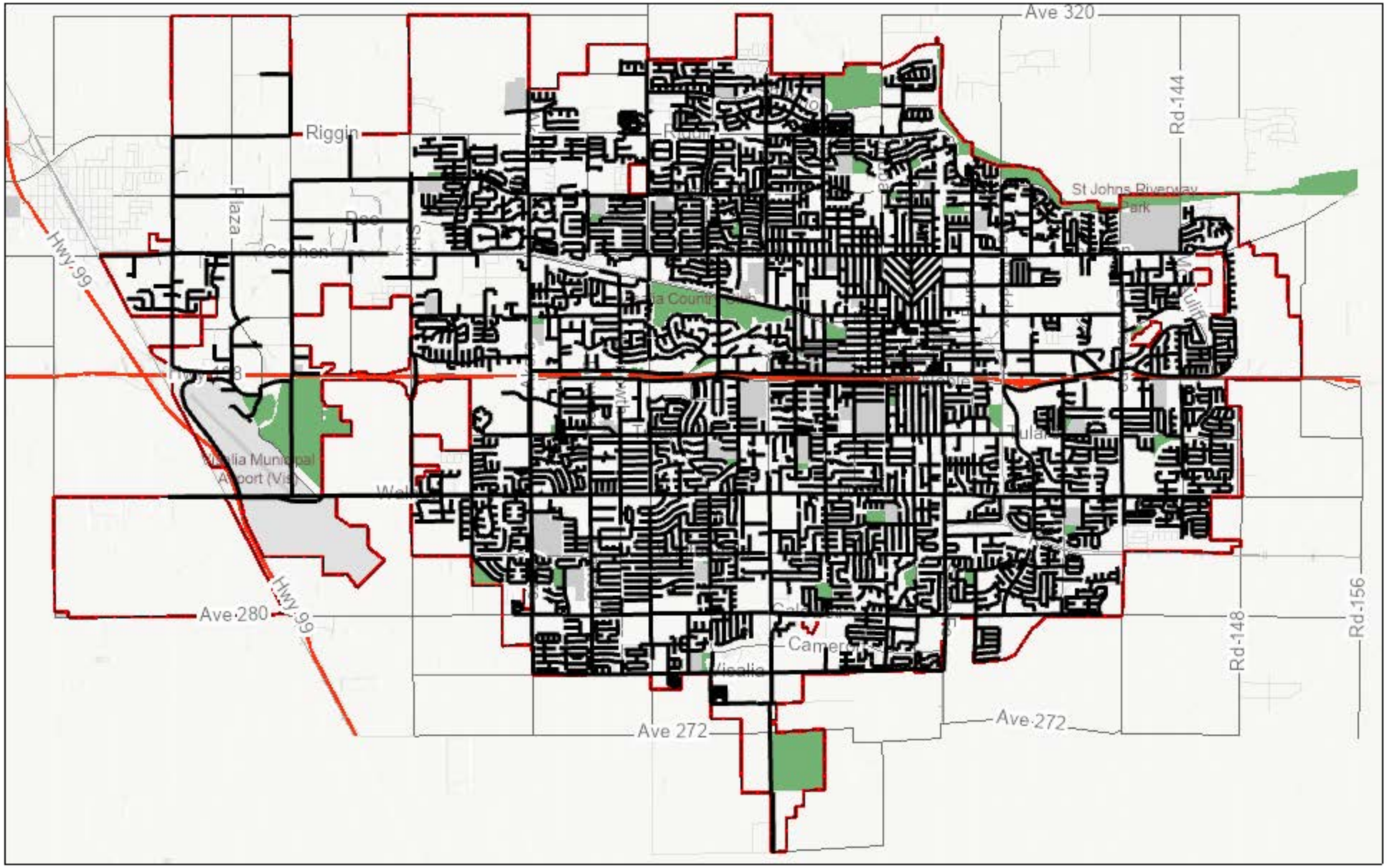
I certify under penalty of perjury that this audit report is true and accurate to the best of my knowledge.

Name: Ben Litwack

Title: Public Works Manager

Date: August 11, 2025

Appendix B - GIS Map



10/31/2025, 8:55:42 AM

Sewer Mains

SEWER MAIN

SEWER FORCE MAIN

1:90,786

0 0.5 1 2 mi

0 1 2 4 km

Esri, NASA, NGA, USGS, FEMA

Ben Litwack

City of Visalia Spill Emergency Response Plan (SERP)

(To be adopted by City Council and included as Appendix C to the SSMP)

---

1. Purpose and Scope

This Spill Emergency Response Plan (SERP) establishes procedures for prompt response to sanitary sewer overflows (SSOs) to minimize public health risks, protect the environment, and comply with **Order No. 2022-0103-DWQ**. The plan applies to all City of Visalia wastewater collection system staff and contractors.

---

2. Spill Detection and Notification

2.1 Detection

SSOs may be detected through:

- Public calls to City Hall, the WRF Operations Control Center, or the City's after-hours answering service (**Professional Communications Network, PCN**).
- Field staff observations during routine inspections or maintenance.
- SCADA alarms from pump stations.
- Reports from other agencies or utilities.

2.2 Notification Procedures

- **Business Hours**: Calls are received by the WRF Control Center (559-713-4403) and dispatched to the Wastewater Collection Superintendent or designee.
- **After Hours**: Calls are received by **PCN**, which immediately contacts the on-call Wastewater Collections staff.
- **Escalation**: The Wastewater Collection Superintendent notifies the Public Works Manager (LRO) for large or sensitive SSOs.

---

3. Spill Response Procedures

3.1 Initial Response

- Dispatch field crew immediately.

- Establish traffic control and site safety.
- Assess the extent of the spill and identify the source.
- Stop the spill at its source where possible.

3.2 Containment and Control

- Use sandbags, plugs, bypass pumping, or vacuum trucks to contain and recover sewage.
- Protect storm drains using mats, plugs, or temporary berms.
- Divert flows to adjacent manholes when feasible.

3.3 Mitigation

- Remove spilled sewage from impacted areas, including storm drains.
- Wash and disinfect paved surfaces with minimal water use.
- Apply absorbent or lime for residual sewage.
- Collect all contaminated materials for disposal at the WRF or other approved facility.

---

4. Notifications to Agencies

4.1 Internal

- Wastewater Collection Superintendent (field response lead).
- Public Works Manager (LRO, CIWQS certification).
- Public Works Director (major events).

4.2 Regulatory

- **CIWQS Reporting** (State and Regional Water Boards): Initial within required timeframe; Certified by LRO.
- **Cal OES**: If spill reaches surface waters.
- **Tulare County Environmental Health**: All Category 1 and 2 SSOs.

4.3 Other Entities

- Water suppliers if potable water sources are threatened.
- Adjacent cities/jurisdictions if flows cross boundaries.

- Public notification if spills impact public areas.

---

5. Documentation and Reporting

- Field crews complete an SSO response report including estimated volume, duration, cause, corrective actions, and photos.
- Wastewater Collection Superintendent reviews and enters data into CIWQS.
- Public Works Manager (LRO) certifies reports.
- All records retained for at least **five years**.

---

6. Training and Drills

- Annual refresher training for all collection staff on spill response, reporting, and safety.
- Annual field drill simulating an SSO response.
- CIWQS data entry training for designated staff.

---

7. Post-Spill Assessment

- Conduct a root cause analysis.
- Evaluate response effectiveness.
- Identify corrective actions (e.g., system improvements, procedural changes).
- Update the SERP annually based on lessons learned.

---

8. Resources and Equipment

- Jet/Vac trucks and CCTV van.
- Portable pumps and generators.
- Sandbags, mats, plugs, absorbents, and disinfectants.
- Traffic control equipment.
- Spill response forms and reporting checklists (included as **Appendices to this SERP**).

---

9. Annual Review

The SERP will be reviewed annually by the **Public Works Department** to ensure compliance with regulations, update contact information, and incorporate improvements based on training and spill events.

APPENDIX D

City of Visalia
Waste Water Reclamation Plant
7579 Ave 288 Visalia, CA 93277
Phone: 559-713-4465

7/14/2025

[redacted]

CASE NUMBER(s): PW28581, PW28583, PW28585
Date of Violation(s):6/12/2025, 6/23/2025, 7/7/2025

This letter serves as official notice that on **June 12,2025; June 23,2025; and July 7, 2025**, your facility was determined to be **non-compliant** in effectively maintaining the level of Fats, Oils, and Grease (F.O.G.) below 25% depth measurement for the grease interceptor. Failing to maintain compliant levels of FOG may result in grease buildup in the facilities later and the City's collection system,

We are issuing an Administrative Citation in the amounts below:

Date:	Citation:	Amount:
6/12/2025	PW28581	$100.00
6/23/2025	PW28583	$200.00
7/7/2025	PW28585	$300.00

Applicable Municipal Codes Sections:

Violation Code: Visalia Municipal Code Section 13.08.480(D) and 13.08.590 Maintenance of Traps

Pursuant to:
VMC 13.08.480: No person shall discharge to public sewer wastes which, in the opinion of the director, cause or are capable of causing either alone or by interaction with other substances:
VMC 13.08.480(D): A nuisance, or prevention of the effective maintenance or operation of the sewer system, through having a strong, unpleasant odor;
VMC13.08.590: When installed, all grease, oil and sand traps shall be maintained by the owner, at owner's expense, in continuously efficient operation at all times.

Action required within 10 business days:

1. [redacted] to pay the administrative citations of:
    - $100.00 for Citation number PW28581 (6/12/2025)
    - $200.00 for Citation number PW28583 (6/23/2025)
    - $300.00 for Citation number PW28585 (7/7/2025)
2. [redacted] to pump out the grease interceptor to achieve a compliant level below the 25% FOG rule in accordance with City Requirements.

Administrative Appeal:

If you wish to file an appeal, you may do so within 10 business days of the date of this notice by following the instructions on the back of the citation. You may also review the entire Visalia Municipal Code on our website at www.visalia.city.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Jennifer Flores
Pretreatment Program Coordinator, PW- WRF
City of Visalia
(559)713-4463
Jennifer.Flores@visalia.city

CC: Tracy Robertshaw, Neighborhood Preservation Manager

Citation Number
28585

City of Visalia • Municipal Code
ADMINISTRATIVE CITATION

❑ Warning Only

VC 9.32.030 - Subsequent violation will result in fine assessment.

Date of Violation 7-7-2025 Time 1:15 am/pm S M T W T F S CE _____

Date Citation Issued July 7th 2025

Name (First, Middle, Last) [redacted] Raising Cane's Chicken Fingers

Address [redacted] 3541 S. Mooney Blvd

City Visalia State CA Zip Code 93277

Driver's License # _____ State _____ Birthdate _____

Sex _____ Hair _____ Eyes _____ Height _____ Weight _____ Race _____ Other _____

Location of Violation _____

Fines for violating the City of Visalia Municipal Code are $100 for the first offense, $200 for a second violation of the same ordinance within one year and $500 for each additional violation within one year.

Section	Description of Violation	Fine Due and Payable
1.	Nuisance or Prevention of	~~$100, $200, $500, or~~ $ 300
2.	the effective maintenance or	$100, $200, $500, or $
3.	operation of Sewer system	$100, $200, $500, or $
4.	13.08.480D	$100, $200, $500, or $
5.	Fix by July 17th 2025	$100, $200, $500, or $

THE TOTAL AMOUNT OF FINE DUE AND PAYABLE WITHIN TEN (10) DAYS IS $ 300 .00

_____ Violation not committed in my presence, declared on information and belief.

Evidence seized? X Photographs taken? (Yes) / No Number attached: 3

Supplemental report(s) attached? Yes / No Department PW-WW

I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct:

_____ Signature of issuing employee

12803 ID#

METHOD OF SERVICE

❑ Personal Service ❑ Certified Mail - Complete

❑ Certified Mail - Pending ❑ Posted at Property with First Class Mail

Employee Name [redacted] Cagey Reaves Print Department _____ Print Phone (559) 625-6010

X [redacted]

WITHOUT ADMITTING GUILT, I PROMISE TO PAY THE FINE OR PAY THE FINE AND REQUEST AN ADMINISTRATIVE HEARING.

If you would like to contest this citation and appear before an Administrative Hearing Officer **you must file a written notice of request to appeal within 10 days of having been issued the Administrative Citation. If you fail to do so your appeal rights shall be deemed waived** and the Administrative Citation fine shall become final. Written Appeal forms are available at:

City of Visalia Community Development Department
315 E. Acequia Avenue, Visalia, CA 93291

FAILURE TO PAY ASSESSED FINES IS A MISDEMEANOR AND VIOLATORS SHALL BE PROSECUTED TO THE FULLEST EXTENT OF THE LAW.

REV. 4/20

FINANCE

Citation Number
PW28583

City of Visalia • Municipal Code

ADMINISTRATIVE CITATION

☐ Warning Only

VC 9.32.030 - Subsequent violation will result in fine assessment.

Date of Violation 6-23-25 Time 7:09 am/pm S M T W T F S CE _____

Date Citation Issued June 23rd, 2025

Name (First, Middle, Last) [redacted] Raising Canes Chicken

Address [redacted] S. Mooney Blvd

City Visalia State CA Zip Code 93277

Driver's License # _____ State _____ Birthdate _____

Sex _____ Hair _____ Eyes _____ Height _____ Weight _____ Race _____ Other _____

Location of Violation Interceptor

Fines for violating the City of Visalia Municipal Code are $100 for the first offense, $200 for a second violation of the same ordinance within one year and $500 for each additional violation within one year.

Section	Description of Violation	Fine Due and Payable
1. 13.08.480 D		$100, $200, $500, or $ 200
2. Nuisance / prevention		$100, $200 , $500, or $
3. of effective maintenance		$100, $200 , $500, or $
4. Fix by July 7th 2025		$100, $200 , $500, or $
5.		$100, $200 , $500, or $

THE TOTAL AMOUNT OF FINE DUE AND PAYABLE WITHIN TEN (10) DAYS IS $ 200 .00

_____ Violation not committed in my presence, declared on information and belief.

Evidence seized? X Photographs taken? Yes / No Number attached: 3

Supplemental report(s) attached? Yes / No Department PW-WW

I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct:

_____ 12803

Signature of issuing employee ID#

METHOD OF SERVICE

☒ Personal Service ☐ Certified Mail - Complete

☐ Certified Mail - Pending ☐ Posted at Property with First Class Mail

Employee Name Adriana C. Print Department _____ Print [redacted]

X [redacted]

WITHOUT ADMITTING GUILT, I PROMISE TO PAY THE FINE OR PAY THE FINE AND REQUEST AN ADMINISTRATIVE HEARING.

If you would like to contest this citation and appear before an Administrative Hearing Officer **you must file a written notice of request to appeal within 10 days of having been issued the Administrative Citation. If you fail to do so your appeal rights shall be deemed waived** and the Administrative Citation fine shall become final. Written Appeal forms are available at:

City of Visalia Community Development Department
315 E. Acequia Avenue, Visalia, CA 93291

FAILURE TO PAY ASSESSED FINES IS A MISDEMEANOR AND VIOLATORS SHALL BE PROSECUTED TO THE FULLEST EXTENT OF THE LAW.

REV. 4/20

FINANCE

Citation Number
PW28581

City of Visalia • Municipal Code
ADMINISTRATIVE CITATION

☐ **Warning Only**

VC 9.32.030 - Subsequent violation will result in fine assessment.

Date of Violation 6-12-25 Time 9:32 (am)/pm SMTWTFS CE _____

Date Citation Issued 6-12-2025

Name [redacted]

Address [redacted]

City Visalia State CA Zip Code 93277

Driver's License # [redacted] State [redacted] Birthdate [redacted]

Sex ___ Hair ___ Eyes ___ Height ___ Weight ___ Race ___ Other ___

Location of Violation interceptor

Fines for violating the City of Visalia Municipal Code are $100 for the first offense, $200 for a second violation of the same ordinance within one year and $500 for each additional violation within one year.

Section	Description of Violation	Fine Due and Payable
1. 13.08.480D		$100, $200, $500, or $ ___
2.	Ne Nuisance/Prevention	$100, $200, $500, or $ ___
3.	of effective Maintenance	$100, $200, $500, or $ ___
4.	fix by June 22, 2025	$100, $200, $500, or $ ___
5.		$100, $200, $500, or $ ___

THE TOTAL AMOUNT OF FINE DUE AND PAYABLE WITHIN TEN (10) DAYS IS $ 100 .00

_____ Violation not committed in my presence, declared on information and belief.

Evidence seized? X Photographs taken? (Yes) / No Number attached: 4

Supplemental report(s) attached? Yes / No Department _____

I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct:

Signature of issuing employee 12803 ID#

METHOD OF SERVICE

☒ Personal Service ☐ Certified Mail - Complete

☐ Certified Mail - Pending ☐ Posted at Property with First Class Mail

Employee Name [redacted] Department _____ Phone _____
Print Print

X [redacted]

WITHOUT ADMITTING GUILT, I PROMISE TO PAY THE FINE OR PAY THE FINE AND REQUEST AN ADMINISTRATIVE HEARING.

If you would like to contest this citation and appear before an Administrative Hearing Officer **you must file a written notice of request to appeal within 10 days of having been issued the Administrative Citation. If you fail to do so your appeal rights shall be deemed waived** and the Administrative Citation fine shall become final. Written Appeal forms are available at:

City of Visalia Community Development Department
315 E. Acequia Avenue, Visalia, CA 93291

FAILURE TO PAY ASSESSED FINES IS A MISDEMEANOR AND VIOLATORS SHALL BE PROSECUTED TO THE FULLEST EXTENT OF THE LAW.

REV. 4/20

FINANCE









Managing FATS, OILS, and GREASE

DON'T...



1

DO NOT pour cooking residue directly into the drain.



2

DO NOT dispose of food waste into the garbage disposal.



3

DO NOT pour waste oil directly into the drain.



4

DO NOT wash floor mats where water will run off directly into the storm drain.

DO...



1

Wipe pots, pans, and work areas prior to washing.



2

Dispose of food waste directly into the trash.



3

Collect waste oil and store for recycling.



4

Clean mats inside over a utility sink.

Partners in Grease Management:

City of Visalia
Water Reclamation Facility-Pretreatment
7579 Ave 288 • Visalia, CA • (559) 713-4465

_ **Pass** _**Fail**

_ **Warning Citation Issued:**_____

_**Citation Issued :** _____

FATS, OIL, AND GREASE (FOG) INSPECTION REPORT FOR FOOD SERVICE ESTABLISHMENTS

Facility Information

Facility Name:_____
Facility Address: _____
Facility Phone: _____
Owner or Authorized Person:_____
Type of Facility:

___ Full Service Restaurant ___ Take Out Eating ___ Pizza Delivery / Carry Out
___ Delicatessen ___ Pizza Parlor Dine In ___ Limited Service Restaurant
___ Donut Shop ___ Fast Food ___ Ice Cream/Frozen Yogurt
___ Snack Bar ___ Bakery ___ Coffee Shop
___ Cafeteria ___ Buffet ___ Catering
___ Other: _____

Inspection:

Contact During Inspection: _____
Inspection Date: Inspection Time (Start to Finish):_____
Inspection Type: ___ Routine ___ Monitoring ___ Enforcement ___ Follow-up

Grease Removal Device (GRD) – 25% Rule Applies

___ Yes ___ No GRD?
GRD type: ___ Interceptor ___ Grease Trap
Device location:_____
Device condition: _____

1st Chamber	2nd Chamber	3rd Chamber	4th Chamber
Oil (Top): ____ in	Oil (Top): ____ in	Oil (Top): ____ in	Oil (Top): ____ in
Solids(Bottom): _____in	Solids(Bottom): _____in	Solids(Bottom): _____in	Solids(Bottom): _____in
Total Oil/Solids: _____in	Total Oil/Solids: _____in	Total Oil/Solids: _____in	Total Oil/Solids: _____in
Hydraulic Depth: _____in	Hydraulic Depth: _____in	Hydraulic Depth: _____in	Hydraulic Depth: _____in
% of Solids: ____%	% of Solids: ____%	% of Solids: ____%	% of Solids: ____%

*Cross out box chamber number that does not apply

Kitchen Inspection

_____ Yes __ No FOG discharge prevention BMP sign posted in dishwashing area

Food Processing/Cooking Equipment

_____ Deep fryer _____ Rotisserie _____ Oven
_____ Charbroiler _____ Wok stove _____ Commercial stove / oven
_____ Grill _____ Steam cooker _____ Tilting skillet / kettle
_____ Griddle _____ Steam table _____ Fryer drain rack/bin
_____ Counter top fryer _____ Other

Dish Washing / Equipment Cleaning

___ Yes ___ No Do all drains (sinks and floor) have screens
___ Yes ___No FOG discharge prevention BMP sign posted in dish washing area
___ Yes ___No FOG discharge prevention BMPs followed
___ Yes ___No Food scraps/waste present in sink
___ Yes ___No Grease/oil residue present in sink
___ Yes ___No Automatic dishwashing unit

Food and solid waste disposal

___ Yes ___ No Food waste segregated from nonfood
___ Yes ___ No Food waste disposed of in trash
___ Yes ___ No Food waste bagged to prevent leakage
___ Yes ___ No Garbage disposal unit

Waste Oil / Grease Disposal:

___ Yes ___ No If fryer draining rack/bin present, absorbent material under fryer draining rack/bin
___ Yes ___ No Grease collector/trap present on grills, char broilers, rotisseries
___ Yes ___ No Grease collector/trap emptied into waste oil container
___ Yes ___ No Waste oil disposal service used
Waste oil / grease storage container location: ___ Inside ___ Outside ___ Covered ___ Bermed
___ Yes ___ No Waste oil / grease storage enclosure/area clean and free of spilled oil/grease and food
___ Yes ___ No Waste oil / grease storage enclosure has drain connected to grease interceptor
___ Yes ___ No Waste oil / grease storage enclosure has connection hot and cold running water
___ Yes ___ No If no drain and water connection, pavement cleaning service contracted
___ Yes ___ No Waste oil / grease storage enclosure separate from trash

Floor Mat Cleaning

___ Yes ___ No Floor mats present in food prep/cooking areas
Mat cleaning location, i.e. indoors/outdoors (describe):_____
___ Yes ___ No Mat cleaning wastewater contained
___ Yes ___ No Mat cleaning wastewater discharged to grease interceptor
___ Yes ___ No Discharge able to reach Storm water System

<u>Record Inspection</u>

Employee FOG Discharge Prevention BMP Training Records

___ Yes ___ No Employees are trained on the FOG discharge prevention BMPs
___ Yes ___ No Records of employee FOG discharge prevention BMP training at facility

Grease Removal Device (GRD) Maintenance Records

___ Yes ___ No GRD maintenance and pump down Records at facility
GRD Cleaning Firm: _____ Phone Number_____
Date last serviced:_____ Pump out removal frequency _____
___ Yes ___ No GRD / Trap scheduled on an automatic schedule

Waste Oil Disposal

___ Yes ___ No Waste oil / grease generated at facility
___ Yes ___ No Records kept at facility
___ Yes ___ No Waste oil / grease removal scheduled on an automatic schedule
Waste Oil Hauler _____Phone Number_____
Date last removed:_____ Waste oil / grease removal frequency?_____

Municipal Code Compliance

13.08.570 Traps required.

Grease, oil and sand traps shall be provided when, in the opinion of the City, they are necessary for the protection of the sewerage system from liquid wastes containing grease in excessive amounts, or any flammable wastes, sand and other harmful ingredients; except that such traps shall not be required for buildings used solely for residential purposes. Such traps shall be required, for example, on discharges from all service stations, automotive repair garages, car washes, restaurants, eating establishments and food preparation establishments, and such other commercial or industrial establishments as the city may designate. (Ord. 2006-02 (part), 2006: Prior code § 4254)

13.08.580 Construction of traps.

All traps shall be of a type and capacity approved by the city and shall be so located as to be readily and easily accessible for cleaning and inspection. Restaurant traps shall be gas-tight, of a type approved for restaurant use by the division of building safety. Traps for all other facilities, including service stations and garages, shall be in accordance with the adopted plan of the city for such traps or shall be the approved equal thereof as determined by the director. (Ord. 2006-02 (part), 2006: Prior code § 4255)

13.08.590 Maintenance of traps.

When installed, all grease, oil and sand traps shall be maintained by the owner, at owner's expense, in continuously efficient operation at all times. (Ord. 2006-02 (part), 2006: Prior code § 4256)

13.08.520 Limitations on the use of garbage grinders.

A. Waste from garbage grinders shall not be discharged into a community sewer except:

1. Wastes generated in preparation of food normally consumed on the premises;

2. Where the user has obtained a permit for that specific use from the city, and agrees to undertake whatever self-monitoring is required to enable the city to equitably determine the user charges based on the waste constituents and characteristics.

B. Such grinders must shred the waste to a degree that all particles shall be carried freely under normal flow conditions prevailing in the community sewer, with no particles greater than one-half inch (1.27 centimeters) in any dimension. Garbage grinders shall not be used for grinding plastic, paper products, inert materials, or garden refuse. The installation and operation of any garbage grinder equipped with a motor of one-half horsepower or greater shall be subject to the review and approval of the city. (Ord. 2006-02 (part), 2006: Prior code § 4249)

13.08.480 Prohibitions on discharges.

No user shall introduce or cause to be introduced into the POTW any pollutant or wastewater which causes pass through or interference. These general prohibitions apply to all users of the POTW whether or not they are subject to categorical pretreatment standards or any other National, State, or local pretreatment standards or requirements.

No person shall discharge to a public sewer wastes which, in the opinion of the director, cause, or are capable of causing either alone or by interaction with other substances:

A. A fire or explosive hazard;

B. Obstruction of flow in a sewer system or injury of the system or damage to the wastewater collection, treatment or disposal facilities;

C. Danger to life or safety of personnel;

D. A nuisance, or prevention of the effective maintenance or operation of the sewer system, through having a strong, unpleasant odor;

E. Air pollution by the release of toxic or malodorous gases or malodorous gas-producing substances;

F. No person or industrial user shall discharge to the city's facilities any substance which has or contains:

1. An end-of-pipe discharge temperature in excess of one hundred fifty (150) degrees Fahrenheit (sixty-five and one-half (65.5) degrees C), or a temperature which will inhibit biological activity in the treatment plant, but in no case heat which will cause the influent at the headworks of the treatment plant to exceed one hundred four (104) degrees F (forty (40) degrees C);

2. More than two hundred (200) mg/l of total oil or grease;

3. Any gasoline, benzene, naphtha, fuel oil or other inflammable or explosive liquid, solid or gas;

4. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in amounts that will cause interference or pass through;

5. Any garbage that has not been properly shredded;

6. Any ashes, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, wood, or any other solid, or viscous substance capable of causing obstructions to the flow in sewers or other interference with the proper operation of the sewage system;

7. Any waters or wastes having a pH lower than 5.5 or higher than 9.0 or having any other corrosive characteristic capable

of causing damage or hazard to structures, equipment or personnel of the sewage system;

8. Any waters or wastes containing toxic or poisonous substances in sufficient quantity to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals or create any hazard in the receiving waters of the sewage treatment plant;

9. Any noxious or malodorous gas or substance capable of creating a public nuisance;

10. No discharge to the sewer shall be permitted that when blended with the remaining city flow shall cause an excess of the following constituent levels in the discharge from the sewage treatment plant.

a. Chlorides: one hundred fifty (150) mg/l,

b. Dissolved solids: six hundred (600) mg/l,

c. Sodium ratio: seventy (70) percent,

d. pH, outside limits: 6.5-8.5 ph units;

11. Which exerts an excessive chemical oxygen demand or chlorine demand to such a degree that the total wastewater received at the sewage treatment plant exceeds treatable limits, as established by the city, for such wastewater;

12. Which shall produce discoloration of the sewage treatment plant effluent;

13. With a volume of flow or concentration of wastes constituting "slugs" as defined in Section 13.08.040;

14. Any substance which may cause the treatment plant's effluent or any other product of the treatment plant such as residues, sludges, or scums, to be unsuitable for reclamation and reuse or to interfere with the reclamation process. In no case shall a substance discharged to city's facilities cause the plant to be in noncompliance with sludge use or disposal criteria, guidelines or regulations developed under Section 405 of the Act; any criteria, guidelines, or regulations affecting sludge use or disposal developed pursuant to the Solid Waste Disposal Act, the Clean Air Act, the Toxic Substances Control Act, or State criteria applicable to the sludge management method being used;

15. Any substance which may cause the treatment plant to violate its NPDES permit or the receiving water quality standards;

16. Pollutants which create a fire or explosive hazard in the city's wastewater collection and/or treatment systems, including, but not limited to, wastestreams with a closed-cup flashpoint of less than one hundred forty (140) degrees F (sixty (60) degrees C) using the test methods specified in 40 CFR Part 261.21.

G. A detrimental environmental impact or a nuisance in the waters of the state or a condition unacceptable to any public agency having regulatory jurisdiction over the city; discoloration or any other condition in the quality of the city's treatment works effluent in such a manner that receiving water quality requirements established by city's NPDES permit cannot be met;

H. Conditions at or near the city's treatment works which violates any statute or any rule, regulation, or ordinance of any public agency or state or federal regulatory body;

I. Quantities or rates of flow which overload the city's collection or treatment facilities or cause excessive city collection or treatment costs. (Ord. 2011-08 § 3, 2011: Ord. 2006-02 (part), 2006: Prior code § 4245)

Required Corrective Actions/Comments

_____

_____

_____

_____

_____

_____

_____

_____

Required Actions Completion and/or Document Submittal Deadline_____

Inspector (Print) _____

Signature of Inspector_____ Date_____

Title _____

This maintenance sheet must be posted near your grease interceptor and be available to the City Industrial Waste Inspector at all times.

GREASE INTERCEPTOR MAINTENANCE LOG

CLEANING FORM

ESTABLISHMENT NAME: INTERCEPTOR SIZE:

ADDRESS: MINIMUM SCHEDULE:

Date Cleaned mo/da/yr	Amount Removed	Method of Disposal	Cleaned by
Example 1: 12/13/93	1,000 gallons	ABC Septic Service	
Example 2: 12/13/93	Three 1 lb coffee cans	Grease/oil barrel for pick up by ABC Company	employee name

Appendix E: Wastewater Collections Equipment Inventory (2025)

Equipment+DA3:E37	Type	Year	Miles / Hours	Unit Number
Dodge 2500	Flat Bed Spray Rig	2022	–	318226
Ford F-350 4x4	Utility Bed	2012	83,000	318218
Ford F-350 4x4	Utility Bed	2015	84,000	318219
Ford F-350 4x4	Utility Bed	2015	54,000	318220
Dodge 5500 4x4 Lift	Utility Bed with boom	2024	30	318227
Ford F-350 4x4	Fleet side bed	2015	45,500	318222
Ford F-350 4x4	Utility Bed	2015	93,000	318223
Ford F-350 4x4	Utility Bed	2017	63,000	318224
Nissan	CCTV Van	2020	4,000	318225
Ford F-350 4x4	Flat Bed 1-Ton (short bed)	2011	110,130	318920
Vac-Con	Jet/Vac Truck	2012	92,000	318921
Vac-Con	Jet/Vac Truck	2013	48,500	318922
Kenworth	10 Wheel Dump Truck	2015	48,500	318923
Vac-Con	Jet/Vac Truck	2015	73,000	318924
Ford F-350 4x4	Flat Bed 1-Ton (long bed)	2019	12,000	318925
John Deere	Gator	2008	518 hrs	318709

John Deere	Skidsteer w/ attachments	2013	1,940 hrs	318710
John Deere	Excavator	2020	268 hrs	318711
John Deere	Backhoe	2020	243 hrs	318712
John Deere	Dozer	2020	320 hrs	318713
Jacobsen Trailer	32' Equipment Trailer	2008	–	318728
Big Tex Trailer	16' Tilt Trailer (Skidsteer)	2013	–	318731
TKT 501P Trailer	Excavator Trailer	2020	–	318734
Sterling	10 Wheel Dump Truck	1999	122,600	314927
Jacobsen Trailer	16' Equipment Trailer	2008	–	238704
Compressor	Mobile Compressor	1993	711 hrs	238729
Vermeer	Wood Chipper	–	–	312776
John Deere	6" Trash Pump	2023	0 hrs	TP-67
Gorman Rupp	6" Trash Pump	2005	264 hrs	TP-64
Gorman Rupp	6" Trash Pump	2023	20.3 hrs	TP-66
Gorman Rupp	6" Trash Pump	2008	82 hrs	TP-62
Gorman Rupp	6" Trash Pump	2008	28 hrs	TP-61
John Deere	125 kVA Generator	2016	–	318732
John Deere	125 kVA Generator	2016	–	318733
Hatz	4" Trash Pump	2008	–	TP-44
Subaru	4" Trash Pump	2008	–	TP-43
Hatz	4" Trash Pump	2008	–	TP-42
Hatz	4" Trash Pump	2008	–	TP-41
–	Port-A-Potty Trailer	2009	–	318730

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Capital Improvement Program
As Of: 11/3/2025

Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
Sanitary Sewer Master Plan: Update the City's Sanitary Sewer Collection System Master Plan based on the prior master plan analysis work done in 2005, taking into consideration the new growth boundaries and land uses established in the current General Plan Update in progress. Will include a nexus study to allow the sanitary sewer trunk line impact fee to be adjusted accordingly. The Sanitary Sewer Collection System Master Plan is an infrastructure plan that needs regular updating for the implementation of the City's General Plan to provide adequately sized sanitary sewer lines for future growth.	Engineering	CP0015		129,843.96	-	-	129,843.96	0.00%
Fleet Shop Improvements & Expansion: Improvements to Edison building at 432 N Ben Maddox Way for Fleet use to include lighting, electrical and air supply for shop equipment & work bays, and shop building heaters, fire sprinklers and required ADA improvements. Fleet's Light Vehicle Shop and Tire Shop will relocate to Edison building after improvements are complete. This project will coincide with EQ0135 (C-Trains) and CP8377 (Hoists). Multi-Funded total of $630k from $467k General Fund (001), $11k Buildings (401), $11k Airport (411), $42k Wastewater (431), $89k Solid Waste (441), $4k Transit (452) and $6k Storm Sewer Maintenance (481).	Fleet	CP0048		42,300.01	-	-	42,300.01	0.00%
Annual Rebuild Sludge Solids Grinders: The WWTP has 7 sludge grinders in operation with a life expectancy of approx. 3 years. Budget allows for two sludge solids grinders to be rebuilt annually. The grinders reduce the larger objects in the sludge to smaller objects to reduce plugging of pumps, lines and digesters. The sludge grinders also make the biosolids more digestible to ensure that the digesters are in top working condition, allowing the organic solids to decompose in order to produce digester gas. This process ensures the biosolids meet Federal and State requirements. Staff intends to replace grinders, as needed.	WRF	CP0322		22,000.00	-	-	22,000.00	0.00%
Cummins Engine Rebuild: Since engine and generator have not yet been operational due to air board regulations, an intermediate overhaul is required to bring the engine online and guarantee proper function and output. The biennial budget schedule is for a top end overhaul, followed by an intermediate overhaul per manufacturers recommendations based on predicted hours of use. Cummins engine must be kept in top running condition to meet San Joaquin Valley Air Pollution Control District permit requirements and reduce the amount of electrical load the treatment facility purchases.	WRF	CP0323		32,666.78	-	-	32,666.78	0.00%
Annual Sanitary Pump Replacement: Project will replace or repair the sanitary sewer lift station pumps when they fail or have reached their 10-12 year life expectancy. The cost of a new pump ranges from $10k to $50k, depending on the size. Pump sizes range from 3hp to 25hp based on the size of the lift station. These pumps can also be rehabilitated and returned to stock if it proves to be more cost-effective.	WRF	CP0324		200,000.00	-	-	200,000.00	0.00%
WRF Catalytic Reduction System	WRF	CP0366		97,615.25	-	97,572.81	42.44	99.96%
Tipton-Mineral King Sewer Repair - The project will repair sewer lines along Mineral King Avenue, Tipton Street, and Santa Fe Street□	Engineering	CP0377		1,527,003.88	-	1,304,393.00	222,610.88	85.42%

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Capital Improvement Program
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Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
Demo Ben Maddox Parking Lot Buildings: Demolition of existing Adobe building which is located in the public ROW, and metal building easterly of Adobe building to allow for Ben Maddox administration parking lot improvements and expansion. Both buildings are of significant age and too costly to retrofit for the useful square footage that would result. This project will include demolition and ground prep only. Phase 2 (CP8216) is for the improvements/expansion to the parking lot. This project will demolish the existing buildings, providing room to reconstruct and expand the existing administration parking lot. Wastewater owns these buildings, therefore will fund the demo to allow for the parking lot improvements and expansion to be done.□	WRF	CP0437		390,000.00	-	-	390,000.00	0.00%
WRF Groundwater Monitoring: Construction of (6) Groundwater Monitoring Wells surrounding the WRF and decommissioning of (6) dry Groundwater Monitoring Wells. The WRF is required to replace any Groundwater Monitoring Well after it has been deemed dry more than (4) consecutive semi-annual testing cycles. Of the total 18 monitoring wells, six have been dry during the last two consecutive semi-annual tests. This is a mandatory requirement by the Water Board to ensure WWTP activities are not effecting the ground water in any detrimental way.	WRF	CP0438		171,510.00	-	-	171,510.00	0.00%
Annual Activated Sludge Overhaul: Replace or rebuild mixers, pumps, air piping , membranes and related air transfer equipment. This overhaul will protect the plant investment and ensure that the activated sludge process removes the organic nitrogen prior to the membrane tanks so permit limits are met. Annual funding covers the cost of one rebuild. In addition, the manufacturer requires, at minimum, (4) tanks to be inspected annually, and rebuilt every 3-5 years.	WRF	CP0439		200,000.00	-	-	200,000.00	0.00%
Annual Digester Gas Cleaning: Replacement & removal of media in the H2S and siloxane vessels. The four siloxane vessels are cleaned annually and two H2S vessels bi-annually. Requires purchase of Sulfatreat Media. The media must be replaced to protect the cogeneration unit and cleaning will ensure the digester gas meets purity level specified by the Cummins engine manufacturer to protect and prolong the life of the co-gen engine, ensuring the digester gas H2S limits set in the CA Air Resources Board (CARB) permit are met.	WRF	CP0440		257,412.54	654.02	-	256,758.52	0.25%
Annual UV Disinfection Process Maintenance: Replacement of ultra-violet (UV) disinfection bulbs, quartz sleeves, wipers and electrical parts. Typically around 550 of the 864 bulbs are replaced throughout the year. This overhaul will maintain the operating condition of the UV equipment to ensure that the required permit UV Dose is maintained 24 hours, 7 days a week. To ensure that the disinfection of the final effluent meets the required permit limits and that the UV Process is in compliance with the UV Operation Plan approved by the Division of Drinking Water.	WRF	CP0441		120,000.00	-	-	120,000.00	0.00%
Irrigation Well: Installation of new irrigation well for orchard near Water Reclamation Facility. As the newly planted trees mature, the existing wells will not provide adequate irrigation for the orchard. .	WRF	CP0443		500,000.00	-	-	500,000.00	0.00%

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Capital Improvement Program
As Of: 11/3/2025

Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
Primary Clarifier Concrete Rehab - Rehabilitate the concrete within the basin, including sand blasting the surface, patching damaged concrete, applying a protective coating to prevent future deterioration.□	WRF	CP0455		293,833.75	-	-	293,833.75	0.00%
Mission Linen Soil Remediation: Fund City's obligated portion of remediation in the general area along Mineral King between Tipton and Santa Fe Streets, and Santa Fe Street and Tipton Street north of Mineral King. Provides reimbursement of activities associated with soil remediation implementation. Apex Companies, LLC. and Environmental Risk Solutions, Inc. are contracted by Mission Linen in compliance with the Imminent and Substantial Endangerment Order as the first step in the contamination cleanup. Additional funds are required for installation and operation of the Soil Vapor Extraction (SVE) Interim Remedial Measure (IRM). Includes prior year funds of $850K from WWTP (431).	Engineering	CP0477		1,744,532.56	132,057.18	-	1,612,475.38	7.57%
Sonic Building Parcel Project□	Public Works	CP0481		12,580.06	-	-	12,580.06	0.00%
Walnut Ave Communications Connectivity: Installation of conduit and fiber optic cable as an extension of the Intelligent Transportation System (ITS) to provide a City owned fiber optic connection to the Water Reclamation Faciltiy (WRF). Provides connection between existing fiber optic communication infrastructure at the intersection of Akers St and Walnut Ave and the intersection of Walnut Ave and Plaza Dr; and bridges the communication gap in Walnut Avenue from Akers Street to Plaza Drive. Multi-funded project total of $1.4m from $530k WWTP (431) including $180K prior year funding, $175k Animal Services (406), $175k Airport (411), and $600k Measure R Local (131).	Engineering	CP0527		530,000.00	-	-	530,000.00	0.00%
Upgrade Water Recycling Facility Receiving Gates: Install gate opener and card reader on Septic Receiving Station gate where local Septage Haulers dispose of collected material. The gate is currently manually opened at 8am and closed at 4pm by staff on a daily basis. This upgrade would fully automate the system providing additional security, accurate tracking, and convenience at the WRF, as well as allowing septic haulers to dump after staff has left the site. Extending the hours for dumping delivers convenience to our septic customers as well as additional revenue to offset septic treatment.	WRF	CP0574	Y	163,407.79	-	-	163,407.79	0.00%
Airport Sanitary Lift Station Rehabilitation: The rehab will remove and replace the discharge pipes from the wall of the lift station to the discharge manifold, and install a flow meter. During the original rehab, the discharge pipes were not replaced and are now showing signs of erosion.	Engineering	CP0578	Y	705,382.20	1,028.72	713,650.00	(9,296.52)	101.32%

Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
Lift Station Connectivity Feasibility Study: This project will hire a consultant to evaluate the connectivity of the existing sanitary sewer and storm drain lift stations Citywide to the City's fiber optic communication system. The consultant will also prepare preliminary plans and construction cost estimate for the proposed connectivity. The existing connectivity between the Wastewater Treatment Plant and the sanitary sewer and storm drain lift stations is aging and some of the equipment is no longer available.	Engineering	CP0579	Y	120,000.00	-	-	120,000.00	0.00%
Annual Sanitary Sewer Maintenance Access Point Repairs: Repair and raise access points throughout the city's sanitary sewer system. Funding will allow replacement of one brick and mortar sewer access point per year, as well as the purchase of frames, risers, and lids to repair damaged access points.	WRF	CP0580	Y	25,000.00	-	-	25,000.00	0.00%
Lab A/C Replacement: The Lab A/C unit is 20+ years old and needs to be replaced based on the recommendations from the Facilities division manager. Since the unit is significantly more complicated than a standard AC system, there will be some redesign work involved with the project.	WRF	CP0581	Y	125,000.00	-	-	125,000.00	0.00%
Membrane Replacement: Replace the membrane curtains per manufacturers recommendation every 8-10 years. One (1) train will be replaced as a trial run in FY25/26 to provide a better understanding of how long each replacement will take. The remaining 9 trains will be replaced during FY26/27 and FY27/28. This will keep the plant running at optimum effeciency. The wear from the wastewater treatment process slowly damages the membrane filters. The lifetime is uncertain as different processes put different stress and wear on the membranes. For safety from violation or emergency replacement all 10 trains will be replaced.	WRF	CP0582	Y	750,000.00	-	-	750,000.00	0.00%
RAS Pump/Motor Rebuild: Complete rebuild of one Return Activated Sludge (RAS) pump and motor annually until all (3) are rebuilt. There are 3 RAS pumps at the RAS Structure. One pump runs 24 hours, 7 days a week and a second pump runs 12-15 hours, 7 days a week. The pumps were placed in service in 2016. Each pump has a life expectancy of approx. 35 years and can be rebuilt every 8-9 years before replacement is necessary (approx. 3 times). The RAS pumps are a critical component for the proper operation of the membrane bio-reactor (MBR) system.	WRF	CP0583	Y	20,000.00	-	-	20,000.00	0.00%
Interstage Pump/Motor Rebuild: Complete rebuild of one Interstage pump and motor annually until all (3) are rebuilt. There are 3 interstage pumps at the Interstage Pump Structure. One pump runs 24 hours, 7 days a week and a second pump will run when high influent flows occur. The pumps were placed in service in 2016. Each pump has a life expectancy of approx. 35 years and can be rebuilt every 8-9 years before replacement is necessary (approx. 3 times). The pumps are critical to ensure flows proceed through the plant.	WRF	CP0584	Y	20,000.00	-	-	20,000.00	0.00%

Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
Upgrade Fuel Management: Upgrade fueling system and equipment, linking three fueling operations to a central location (Corp yard, Police/Fire 51, WWTP) providing complete fuel accounting, instant reconciliation across multiple sites, real-time fuel data access for monitoring and reporting, and upgrade to keyless tracking with vehicle sensors. Current software is outdated and parts are becoming hard to locate. The condition of City fueling infrastructure will be evaluated prior to moving forward with this project. Multi-Funded total of $200k from $148k General Fund (001), $3k Buildings (401), $3k Airport (411), $13k Wastewater (431), $28k Solid Waste (441), $1k Transit (452) and $2k Storm Sewer Maintenance (481).	Fleet	CP0591		13,400.00	-	-	13,400.00	0.00%
WRF Master Plan Upgrades - improvements to the sludge thickening and conveyance system and improvements to the dewatering processes including construction of a third screw press, additional sludge drying beds, and a new sludge holding reservoir.□	WRF	CP0636		19,420,487.50	5,456.00	15,273,119.19	4,141,912.31	78.67%
Virmargo Right of Way & Utility Installation: Acquisition of Virmargo Right of Way between Goshen and Houston, design and construction of sewer lift station at Goshen and Virmargo (to be coordinated with park/pond) and installation of storm and sewer main in Virmargo alignment. Connects to Irma Sewer (CP9457) by designing and constructing sewer lift station and main to serve Irma and undeveloped area between Goshen and Houston allowing future tie-in of development north of Goshen to future park/pond funded by separate CIP request. Multi-funded project total of $2.6m from $791k Storm Sewer Construction (221), $873k Wastewater Trunkline (231), $873 WWTP (431), and $117k Transportation Impact Fee (241).	Engineering	CP0657		872,457.88	-	-	872,457.88	0.00%
Sanitary Lift Station Connectivity & Signal Interconnect: Install City owned fiber optic connection to existing sanitary lift stations at the airport and golf course along the south side of Hwy 198 and extend the signal interconnect to Crowley Ave at Plaza Dr. using existing communication conduit and installing new conduit from the Airport to two sanitary lift stations allowing remote real time monitoring of sanitary volume flows. Construction contingent upon grant funding from state/federal grant funds. Multi funded project total of $1.6m from $100k Measure R Local (131), $430K WWTP (431), $1.16m State Transportation (281-CMAQ).	Engineering	CP0664		430,000.01	-	-	430,000.01	0.00%
Corporation Yard Facility Assessment & Master Plan: Assess needs and conditions of various City Departments whose operations and administrative staff utilize the Corp Yard. Includes review of space needs for offices, operations, vehicle, equipment, and future infrastructure for charging/fueling zero emission vehicles. The City has identified various projects to accommodate growth and improved efficiency. The Master Plan will establish the future configuration for the Corp Yard property and the best path for implementation of interrelated projects. Multi-funded project total of $150k from $65k General Fund (001), $3k WRF (431), $76k Solid Waste (441), $3k Bldg Safety (401) and $3k Storm Sewer (481).	Public Works	CP0667		3,000.00	-	-	3,000.00	0.00%

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Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
ZEV Fleet Assessment & Transition Plan: The California Air Resources Control Board (CARB) requires transition of vehicle fleets state-wide to meet zero-emission vehicle (ZEV) regulations. The City must evaluate its fleet of vehicles and equipment to determine the best method to transition to a zero-emission fleet. The project will identify the best alternative fuel, appropriate vehicle types and applications, necessary infrastructure, and potential funding options to implement changes. Multi-Funded total of $200k from $148k General Fund (001), $3k Buildings (401), $3k Airport (411), $13k Wastewater (431), $28k Solid Waste (441), $1k Transit (452) and $2k Storm Sewer Maintenance (481).	Fleet	CP0670		13,400.00	-	-	13,400.00	0.00%
Annual Sanitary Lift Station Repair: The majority of the sanitary lift stations have been rehabilitated over the last several years, with a few remaining that require minor repairs such as entry hatch replacements or concrete surface coating. After the completion of the final lift station rehab, this project will continue to be utilized for a variety of miscellaneous repairs, as needed.	WRF	CP0729		100,000.00	-	-	100,000.00	0.00%
Extend Depth of Fresh Water Well #1: Deepen Well #1 to 400ft, insert a 10-inch line inside the pre-existing 12-inch line, and install a pump to ensure sufficient fresh water is provided to the plant. Currently, only Well #3 can sustain the entire plant. Well #2 production is insufficient at a depth of 192ft deep with standing water at 164ft. Well #1 collapsed in 2008 and was abandoned. If Well #3 were to fail, well water could not sustain the plants needs. After Well #1 is deepened, Well #3 will become backup.	WRF	CP0730		129,831.25	-	15,741.25	114,090.00	12.12%
Headworks Bio-Filter Media Replacement: Change out Media, Wetting System replacement, and Liner repairs in Bio-filter Basins used to scrub air from the Headworks. Current media will have been in use for 8 years. Media is breaking down and sealing off air flow. The liner may need to be repaired/replaced within the Basins and the Wetting System will also need to be replaced. The odor control of the media is waning and it is getting saturated with H2S from headworks.	WRF	CP0731		60,000.00	-	-	60,000.00	0.00%
Replace Digester #6 Recirculation Pump: Replace the Recirculation Pump on Digester #6, pump which is over 20 years old. Sludge recirculation pumps run 24 hours per day, 7 days per week. The pumps recirculate the sludge through the heat exchanger to maintain the sludge at 98 degrees F. Replacement will ensure proper digestion of the digester contents and meet regulatory requirements.	WRF	CP0732		16,112.25	-	16,112.25	-	100.00%
Replace Digester #5 & #7 Recirculation Pumps: New Vaughn Chopper sludge recirculation pumps for Digester #5, #7 to replace pumps over 20 years old. Sludge recirculation pumps run 24 hours per day, 7 days per week. The pumps recirculate the sludge through the heat exchanger to maintain the sludge at 98 degrees F. Replacement will ensure proper digestion of the digester contents and meet regulatory requirements.	WRF	CP0733		35,587.46	-	35,587.45	0.01	100.00%
Giddings Culvert - Giddings Street Culvert Replacement□	Engineering	CP0773		136,699.59	-	-	136,699.59	0.00%
Anaerobic Digestion Capacity Expansion (near-term)	WRF	CP0789		4,200,000.00	-	-	4,200,000.00	0.00%
Polymer Mixing Skid on GBT	WRF	CP0790		360,000.00	-	-	360,000.00	0.00%

WWTP - 431
Capital Improvement Program
As Of: 11/3/2025

Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
Corp Yard Storm Water Drainage: Install Storm Drainage System at the Corporation Yard to provide grease & sediment treatment to the existing Corporation Yard storm water drainage system. (Multi-funded: Project total of $90k from $68k Solid Waste (441), $9k WWTP (431), $13k General Fund (001).)	Public Works	CP8216		26,606.71	-	-	26,606.71	0.00%
Sanitary Lift Station Rehab: Replaces sanitary lift station piping, valves, pump bases, entry hatches concrete surface rehabilitation and coatings for sanitary and storm lift stations. 12 of 13 stations have been rehabilitated. The final one, located at Mooney @ Ave. 272, is old and outdated making maintenance difficult. This station will also be fitted with a larger entry hatch, discharge pipes, stainless steel railing, pump and pump saddles bringing this final sanitary lift station up to date with the all the others. After completion of the 13th station, this annual project will begin the cycle again.	WRF	CP8266		265,189.81	-	-	265,189.81	0.00%
Annual Influent Pump Rebuild: Complete rebuild of two (2) Influent pumps and motors for upkeep of plant investment. Two to three influent pumps run 24 hours 7 days a week pumping the wastewater that enters the plant to the treatment processes to clean the water. Currently there are six influent pumps, and one to two pump units are rebuilt annually. The cost to replace the influents pumps is double the cost and is followed by long delivery times. Staff recommends the influent pumps be rebuilt.	WRF	CP8369		130,900.00	-	-	130,900.00	0.00%
Replace (3) Underground and (1) Above ground Vehicle Hoists: Current hoists are over 25 years old, obsolete and undersized for newer heavier equipment. Parts are no longer available and must be manufactured. Multi-Funded total of $250k from $185k General Fund (001), $4k Buildings (401), $4k Airport (411), $17k Wastewater (431), $35k Solid Waste (441), $2k Transit (452) and $3k Storm Sewer Maintenance (481).	Fleet	CP8377		16,800.00	-	-	16,800.00	0.00%
Annual Sewer Lateral Connections, Replacements, Installations: Staff administration to provide customer requested hookups to the sanitary sewer, including lateral replacements. Contract costs are reimbursed by the property owner, typically through 10 year payment agreements collected through Property Tax payments. This project allows connections and repairs to private sewer laterals for property owners unable to afford the high cost of sewer lateral improvements.	Engineering	CP9228	Y	50,000.01	-	-	50,000.01	0.00%
Annual Primary Clarifier Overhaul: Replace wear shoes, wear strips, chains, sprockets, and flights in each of the 5 primary tanks. One tank is replaced each year. This equipment must be kept in top running condition in order to remove solids and scum from the treatment system and for upkeep in plant investment.	WRF	CP9362		25,000.00	-	-	25,000.00	0.00%
Annual Replace and Relocate Sanitary Sewer Mains: Replace mains shown to be deteriorating throughout the City and relocate sanitary sewer mains as necessary to accommodate development of property formerly used as streets or alleys. Prevents sewer failure which can cause overflows and service disruptions. Includes acquiring consultant services to help develop a formalized Sewer Repair Maintenance Plan.	WRF	CP9456		1,089,500.01	-	89,499.60	1,000,000.41	8.21%

WWTP - 431
Capital Improvement Program
As Of: 11/3/2025

Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
Annexed Island Sanitary Sewer Install: Install sanitary sewers in county islands annexed into the City to provide sewer service to new areas. The residents who choose to connect to the sewers pay connection fees that are used to reimburse the construction cost. Remaining area for this project is Areas 6 (Irma & Houston). Project total of $965k from WWTP (431) including $778k prior year funding.	Engineering	CP9457	Y	763,246.85	-	-	763,246.85	0.00%
Digester Cleaning & Equipment Repairs: Digester units need to be cleaned of accumulated grit, rags and plastics. Related pumps, valves and digester gas equipment need to be repaired or replaced. The actual cleaning of the digester contents begins in the FY22/23 (#1-4) and concludes in FY23/24 (#5-7), each with a cycle of 7 years. Digester units must be kept in top working condition in order to decompose organic solids to produce digester gas, and ensure the biosolids meet Federal and State requirements. The cost to clean & repair each digester is based on size (#1-4 are smaller compared to #5-7).	WRF	CP9768		1,116,089.20	-	-	1,116,089.20	0.00%
Belt Filter Press Unit Rental - 2 year rental□	WRF	EQ0234		132,807.45	53,900.00	-	78,907.45	40.59%
MBR Breaker Spare: Purchase of a plant spare to keep downtime to a minimum and protect plant investment ensuring that the MBR Process runs to remove the organics and solids prior to the UV treatment process to meet permit limits. MBR must be kept in good running condition to meet State Water Board permit requirements and prevent violations.	WRF	EQ0248		100,000.00	-	-	100,000.00	0.00%
Aerzen Blower Shelf Spare: There are five aeration blowers, each with an expected life cycle of 40,000 hour run time (about 5 years if running constantly.) Two blowers usually run continuously, with additional units coming online to meet periods of high demand. Blowers are rotated periodically. Obtaining a replacement blower is a lengthy process, so a shelf spare will allow the blower to be replaced and back in service in a timely manner.	WRF	EQ0249		43,692.96	43,692.96	-	-	100.00%
Aerzen Blower Motor□	WRF	EQ0279		43,640.26	43,640.26	-	-	100.00%
Aerzen Blower Rental - Rental for 2 months while waiting for repairs to current basin blowers and new blowers.□	WRF	EQ0280		82,530.00	44,442.43	43,827.62	(5,740.05)	106.96%
Grinder Replacement	WRF	EQ0282		-	-	46,420.15	(46,420.15)	#DIV/0!
Replace (3) Portable Pump Trailers: These pump trailers are utilized citywide during severe storm events to prevent sewer overflows and localized flooding. The current pumps no longer meet CA Air Resources Board (CARB) compliance standards and need to be replaced. Multi-funded total of $147k funded from $111k WRF (431) and $36k Storm Sewer (481).□ □ Budget Year / Unit / Age□ 2024-25 / TP-61 / 17□ 2024-25 / TP-62 / 17□ 2024-25 / TP-64 / 17	WRF	VH0291		136,170.79	-	-	136,170.79	0.00%

WWTP - 431
Capital Improvement Program
As Of: 11/3/2025

Project Description	Project Manager	Project #	Construction	Budget	Actual	Encumbrance	Balance	Allocated
Purchase Golf Cart for new Water Reclamation Facility Custodian position.	WRF	VH0304		11,000.00	-	-	11,000.00	0.00%
Total				**38,024,238.77**	**324,871.57**	**17,635,923.32**	**20,063,443.88**	**47.24%**

City of Visalia
Agenda Item Transmittal

Meeting Date: August 20, 2012

Agenda Item Number (Assigned by City Clerk):

Agenda Item Wording:
Adoption of the Sewer System Maintenance Program for the City of Visalia as required by the Water Quality Control Board.

Deadline for Action:

Submitting Department: Public Works

Contact Name and Phone Number: Jim Ross, Public Works Manager, 713-4466

For action by:
_X_ City Council
___ Redev. Agency Bd.
___ VPFA

For placement on which agenda:
___ Work Session
___ Closed Session

Regular Session:
___ Consent Calendar
___ Regular Item
_X_ Public Hearing

Est. Time (Min.):_____

Review:

Dept. Head _____
(Initials & date required)

Finance _____
City Atty _____
(Initials & date required or N/A)

City Mgr _____
(Initials Required)

If report is being re-routed after revisions leave date of initials if no significant change has affected Finance or City Attorney Review.

Department Recommendation:
Staff recommends that Council approve and adopt the Sewer System Management Program (SSMP) for the City of Visalia in compliance with State Water Resources Control Board General Order No. 2006-0003. This General Order contains the regulatory requirements for all sanitary sewer collection systems in the State of California consisting of more than one mile of sewer mains.

The SSMP outlines how the City operates and maintains the collection system. The required elements of the SSMP constitute a best management practices approach to the regulations of collection systems, and consists of the following elements.

1. Introduction
2. Goals
3. Organization
4. Legal Authority
5. Operation and Maintenance Program
6. Design and Performance Provisions
7. Overflow Emergency Response Plan
8. Fats, Oils and Grease (FOG) Control Program
9. System Evaluation and Capacity Assurance Plan
10. Monitoring, Measurement and Program Modifications
11. SSMP Audits
12. Communication Plan

A brief discussion of the required elements is given, below.

Summary
On May 2, 2006 the State Water Resources Control Board (SWRCB) adopted a General Order regulating sanitary sewer collection systems. The purpose of this General Order is to insure that wastewater collection systems are properly operated and maintained. The Order applies to all public agencies in California that own or operate collection systems comprised of more than one mile of pipe or sewer lines. With more than 470 miles of sewer mains, Visalia falls under the Order.

The Order requires the City to prepare a Sewer System Management Plan (SSMP) which outlines how the municipality operates and maintains the collection system. Under the General Order, the SSMP must be approved and adopted by the City Council.

Background:
On May 2, 2006 the State Water Resources Control Board (SWRCB) adopted a General Order regulating sanitary sewer collection systems. The purpose of this General Order is to insure that wastewater collection systems are properly operated and maintained. Sanitary sewer collection systems are the last major component of the wastewater management system to be regulated.

The Order applies to all public agencies in California that own or operate collection systems comprised of more than one mile of pipe or sewer lines. With more than 470 miles of sewer mains, Visalia falls under the Order.

The Order requires the City to prepare a Sewer System Management Plan (SSMP) which outlines how the municipality operates and maintains the collection system. The SSMP must then be approved and adopted by the City Council.

The required elements of the SSMP constitute a best management practices approach to the regulations of collection systems. A brief discussion of the required elements follows.

1. Introduction: provides an overview of the SSMP.

2. Goals: This SSMP has been prepared in order to achieve the following goals:
   - Properly manage, operate and maintain all aspects and components of the City's wastewater collection system.
   - Provide the wastewater collection system with adequate capacity to convey peak wastewater flows.
   - Minimize the occurrence of Sanitary Sewer Overflows (SSO) to the extent possible.
   - Mitigate the impacts that are associated with any SSO that may occur.
   - Meet all regulatory requirements related to the SSMP and SSO reporting system.

3. Organization: This chapter identifies the responsible representative from the City of Visalia for the implementation of this SSMP. It also includes an organizational chart and a chain of communication for reporting SSOs.

4. Legal Authority: This chapter serves to confirm that the City has the authority, through ordinances, service agreements or other legally binding procedures, to
   - Prevent illicit discharges into its sanitary sewer system,
   - Require that sewers and connections be properly designed and constructed,

- Ensure access for maintenance, inspection or repairs of portions of the lateral owned by City, and
- Enforce any violation of its sewer ordinance.

5. Operation and Maintenance Program: This chapter contains a description of the City's operation and maintenance program, including the following elements.
   - An up-to-date map of the sanitary sewer system,
   - Description of routine preventative operation and maintenance activities, including a system for scheduling, performing and documenting activities.
   - A plan to identify and prioritize system deficiencies and corrective actions taken to correct those deficiencies.
   - A program to provide appropriate training, and
   - A description of the equipment and replacement part inventory program.

6. Design and Performance Provisions: This chapter presents a summary of the City's design and construction standards, as well as its standards for the inspection and testing of sewers, pumps and other system components.

7. Overflow Emergency Response Plan (OERP): This chapter contains a description of the City's OERP that serves to provide measures to protect the public health and the environment in the event of an overflow. The OERP includes the following:
   - Proper notification procedures,
   - Guidelines to ensure an appropriate response to overflows,
   - Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained,
   - Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities, and
   - A program to ensure that all reasonable steps are taken to contain and prevent discharge of untreated or partially treated wastewater,

8. Fats, Oils and Grease (FOG) Control Program: This chapter discusses the need for a Fat, Oil and grease (FOG) control program to limit the amount of FOG that enters the collection system. A FOG control program must include the following:
   - The legal authority to prohibit FOG discharges into the system,
   - The legal authority to inspect grease producing facilities,
   - The development and implementation of source control measures for FOG, and
   - A public education outreach program that promotes the proper disposal of FOG.

9. System Evaluation and Capacity Assurance Plan: This chapter provides an evaluation of the City if Visalia (City's) sanitary sewer system facilities, identifies and proposes improvements for deficiencies, identifies design criteria and provides a Capital Improvement Program (CIP) and schedule for improvements.

10. Monitoring, Measurement and Program Modifications: This chapter presents a summary of the steps to be taken to evaluate the effectiveness of the SSMP and to update it should improvements be necessary or desirable. The City shall:
    - Maintain relevant information to establish and prioritize appropriate SSMP activities,
    - Monitor the implementation and effectiveness of each element of the SSMP, and
    - Update program elements based on monitoring or performance evaluations.

11. SSMP Audits: This chapter presents a summary of the procedures to be used by the City to perform internal audits of the City's SSMP. These biennial reviews will focus on the effectiveness of the SSMP and the City's compliance with the program's requirements. Also described are the procedures to be taken should any deficiencies be identified.

12. Communication Plan: This chapter presents a summary of the steps to be taken by the City to communicate with the public regarding the SSMP elements. The SSMP must be presented to the City Council for approval at a public meeting and must be certified to be in compliance with program requirements in the General Order. The SSMP must be updated every five years or when significant updates to the SSMP are made.

In compliance with the General Order, staff recommends that Council adopt the SSMP for the City of Visalia.

Prior Council/Board Actions: none

Committee/Commission Review and Actions: none

Alternatives:

Attachments: City of Visalia Sewer System Management Plan

Recommended Motion (and Alternative Motions if expected):

Move to approve and adopt the Sewer System Management Program for the City of Visalia in compliance with State Water Resources Control Board General Order No. 2006-0003.

Environmental Assessment Status

CEQA Review:

NEPA Review:

Tracking Information: (*Staff must list/include appropriate review, assessment, appointment and contract dates and other information that needs to be followed up on at a future date)*

Copies of this report have been provided to:

APPENDIX H

Public Works Department

City of Visalia

JULY 2025

1041 NRCD/HHW
3106 PW Management
3108 PW Administration
3109 Streets & Traffic Maintenance
3124 Street Maintenance
3126 Traffic Maintenance
4330 WWTP zero div
4331 WWTP Management
4332 WWTP Operations
4333 WW Quality Assurance
4334 WWTP Mechanical Maint
4335 WW Sanitary Sewer
4336 Bio Solids
4344 WWTP Farm
4410 Solid Waste zero div
4418 SW Administration
4421 PW Constr/Demo & Waste Red
4442 Solid Waste Maintenance
4443 Solid Waste Residential
4444 Solid Waste Comm Roll Off
4445 Solid Waste Comm Front Load
4880 Storm Sewer Maint zero div
4881 Storm Sewer Maintenance
5010 Fleet Maintenance zero div
5012 Fleet Maintenance
5013 Fleet Parts
5014 Fleet Fuel

FTE = Full Time Employees
E = Employees

132/143

Nick Bartsch
Public Works Director
3106

Sirena Sahagun
Sr. Administrative Assistant
3106

94/104

Errica Salinas
Sr. Administrative Analyst
3108

71.5/76.5

Jason Serpa
Public Works Manager
4418

VACANT
Public Works Manager
1045

26.5/27.5

Danny Galindo
Public Works Manager
3109

Water | **Conservation**

Solid Waste – Res | **Solid Waste - Comm** | **HHW/SPR / Waste Assessments**

Fleet | **Maintenance** | **Streets** | **Traffic** | **Safety**

20/24.5

Kevin Wood
Solid Waste Supervisor
4443

23/23

Victor Guzman
Solid Waste Supervisor
4443

23/23

Edward Zuniga
Solid Waste Supervisor
4445

4.5/5

Nathan Garza
Conservation Tech
1041

Sr. Office Assistant (1045)
Ana Boswell

13/13

Steve Ellis
Fleet Maintenance Supervisor
5012

8/8

Jon Pierce
Streets Maint. & Trfc Cntrl Supervisor
3124

5/5.5

Tony Pires
Traffic Operations Supervisor
3126

Lead Solid Waste Operator (4442)
Blas Garcia

Lead Solid Waste Operator (4443)
Esaul Perez

Solid Waste Delivery & Maint Worker (4442)
Rafael Guzman
Juan Morales

Overfill (4442)
Phillip Mahan

Solid Waste Operator (4443)

Dennis Thatcher
Edgar Gutierrez
Edgar Uribe
Fernando Carranza
Griselda Haro
Hector Madera
John Sanchez
Joshua Bennetts
Juan Tadeo
Eddie Moreno
Richard Martinez
Sean Van Kampen
Shannon Crisp

Solid Waste – Maint

Hourly (4442)
Francisco Ybarra
Joe Diaz
David Smith
VACANT

VACANT – ECO
VACANT - ECO
VACANT (4445) - ECO
VACANT (4445) - ECO

Lead Solid Waste Operator (4443)
Andre Medina

Solid Waste Operator (4443)

Andrew Cerda
Chris Hulsey
Chris Prine
Danny Anderson
Greg Brisco
Jeffrey Wooster
Jesse Balderrama
Jorge Castro Portillo
Joshua Cain
Julian Del Angel
Luis Bernal
Michael McCarthy
Stan Padilla
Steven Torres
Tommy Waltjen
Thomas Lopez
Travis Stewart

Solid Waste Roll Off (4444)

Alejandro Arzola-Soto
David Boling
Fernando Modesto
Jose Garcia

Lead Solid Waste Operator (4445)
Grego Flores
Luis Navarro

Solid Waste Operator (4445)

Carlos Martinez
David Kersey
Erik Barajas-Moreno
Garian Martin
Hedilberto Gomez
Jason Castro
Javier Flores Vera
Jeffrey Vandertuig
Jesus Suastes
Jorge Maciel Ramirez
Lazaro Torres
Mariano Calderon
Mark Bradley
Michael May
Ron Poggione
Victor Avila
Thomas Reynoso

Hourly (1041)
VACANT
Chris Ogletree
David Arredondo
David Diaz
Gustavo Gomez
Jason Adair
Jesus Garcia-Gomez
VACANT

Waster Conservation Inspectors (1045)
Doug Asher
Edward Delgado
Craig Hardy
Robert Mueller

Lead Mechanic (5012)
James Andrew

Sr. Equipment Mechanic (5012)
Enrique Villarreal
Guillermo Guerra
Jeff Carson
Nathan Uhlenhopp
Robert Brooks
Ryan Spohn
Tim Helgeson

Equipment Mechanic (5012)
Landan Neal
Rafael Murillo
Nicholas Fernandes

Equipment Mechanic Trainee (5013)
Ryan Gonzalez

Lead Street Maint. Worker (3124)
Russell Walker

Heavy Eq Operator (3124)
Eddie Espirito
Ramon Alvarez
Arturo Enriquez

Street Maint. Worker (3124)
Jason Villalva
Rolando Ojeda
Joseph Gonzalez

Traffic Signal Tech. (3126)
Juan Ramirez
Luis Cedano

Traffic Safety Worker (3126)
Michael Ficken
VACANT (Hourly)

Underground Service Alert Technician (3126)
Cody Looper

Public Works Department

City of Visalia

JULY 2025

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5014 Fleet Fuel

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E = Employees

131/144

Nick Bartsch
Public Works Director
3106

Sirena Sahagun
Sr. Administrative Assistant
3106

36/38

Ben Litwack
Public Works Manager
4331

Michelle Correa
Sr. Office Assistant
3108 / 4331

Water Reclamation Facility

10/11

VACANT
Waste Water Treatment Plant Superintendent
4331

4/4

Jennifer Flores
Pretreatment Prog. Coord.
4333

Waste & Storm Water Collection

11/12

Ricardo Paredez
Waste Water Collection Superintendent
4335

Rehana Cale
Public Works Project Manager
4331

9/9

Lead WW Trt Plant Operator 4332
Joe Hernandez

Sr. WW Trt Plant Operator (4332)
Jerry Gutierrez
Manuel Martinez

WW Trt Plant Operator III (4332)
Aaron Boyd
Charles Green
George Sanchez
Marco Ramirez
Scott Bauer
Travis Brassfield

Eric Oates
Waste Water Treatment Plant Maintenance Supervisor 4334

Lead WW Maint. Tech 4334
Jim Hestily

Maintenance Mechanic (4334)
Cesar Flores
Cory Van Noort
Manuel Alvarez
Scott McKay
Victor Gomez
Victor Villegas

Maintenance Mechanic Asst. 4336
Saul Guzman

Maintenance Service Worker 4334
Alyssa Ojeda

Industrial Waste Wtr. Inspt. 4333
Agustin Morales
Faptima Velasco
Samuel Aceves

Lead Waste Water Maint. Tech (4335)
Armand Gonzales
Michael Demmers

Sr. Waste Water Maint. Worker
Cruz Ruiz (4881)
Juan Arreola (4335)

Waste Water Maint. Worker
Francisco Serna (4335)
Jeff Riley (4335)
Ismael Meza (4881)
VACANT (4881)

Maint. Service Worker (4881)
Hector Rodrigues
Michael Weatherly

Heavy Equip. Operator (4881)
James Southern Jr.

APPENDIX I

CITY OF VISALIA

ENGINEERING STANDARD SPECIFICATIONS

COMMUNITY DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION



AUGUST 5, 2013

PREPARED BY:
CITY OF VISALIA
ENGINEERING DIVISION
315 E. ACEQUIA AVE.
VISALIA, CA 93291

CITY OF VISALIA

ENGINEERING STANDARD SPECIFICATIONS

COMMUNITY DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

The City of Visalia Engineering Division has recently revised and updated this set of Engineering Standard Specifications. These Standard Specifications have been used as accepted standards for subdivisions, and other building, public works, and parks projects. These Standard Specifications and Engineering Improvement Standards will be considered for updates as practices and materials change, and these updates will occur on an as needed basis and will be approved by the City Engineer; these updates will be automatically incorporated as part of the whole Standard Specifications.



Approved by: _____ R.C.E. 76065
City Engineer

AUGUST 5, 2013

PREPARED BY:
CITY OF VISALIA
ENGINEERING DIVISION
315 E. ACEQUIA AVE.
VISALIA, CA 93291

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STANDARD SPECIFICATIONS

Copies of the "City of Visalia Engineering Standard Specifications" may be obtained from the City of Visalia website at: http://www.ci.visalia.ca.us/depts/engineering/engineering_documents/default.asp or from City Hall East, 315 E. Acequia Ave., Visalia, California, 93291, for a nominal fee.

SECTION 1 GENERAL, DEFINITIONS, ABBREVIATIONS AND TERMS

1-1 General

Unless the context otherwise requires, wherever in these Standard Specifications and other Contract Documents the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as provided in this Section 1.

Reference to a particular section in these Standard Specifications is made by section number without denoting "of these Standard Specifications." Reference to standard specifications or standards of other agencies or organizations is so noted. See Section 4-8, "Incorporation of Referenced Specifications."

Where a location is not specified with the words "shown," "specified," or "described," interpret:

A. "Shown" as "shown on the plans."
B. "Specified" as "specified in the specifications."
C. "Described" as "described in the Contract." "Described" means "shown, specified, or both."

The specifications are expressed in U.S. customary units except where a referenced document uses the International System of Units as the standard.

These Standard Specifications and Contract Documents are meant to work in direct line with Sections 10-60, Section 73, and Sections 82-95 of the 2010 version of the State Standard Specifications, except as modified by these Standard Specifications and Contract Documents. For terms, specifications, and requirements appearing in these Standard Specifications and Contract Documents and the State Standard Specifications, these Standard Specifications and Contract Documents shall take precedence. Other sections of the State Standard Specifications are included by reference in these Standard Specifications and Contract Documents. In the event where items are not covered or specified in these Standard Specifications or Contract Documents, the State Standard Specification Sections listed above and State Standard Plans shall govern.

1-2 Abbreviations

Where used in these Standard Specifications and Contract Documents, the following abbreviations shall have the titles affixed thereto in the table below.

Abbreviations

Abbreviation	Meaning
AASHTO	American Association of State Highway and Transportation Officials
AB	aggregate base
AC	asphalt concrete
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
AS	aggregate subbase
ASTM	American Society for Testing and Materials
AWG	American Wire Gauge
AWS	American Welding Society[a]
AWWA	American Water Works Association
BBS	battery backup system
Cal/OSHA	California Division of Occupational Safety and Health Administration
CBC	California Building Code
CIP	cast in place
CMP	corrugated metal pipe
CMU	concrete masonry unit
DBE	Disadvantaged Business Enterprise
F	Fahrenheit
FHWA	Federal Highway Administration
HMA	hot mix asphalt
MSDS	material safety data sheet
MUTCD	*California Manual on Uniform Traffic Control Devices*
NPDES	National Pollutant Discharge Elimination System
PCC	portland cement concrete
PLAC	permit, license, agreement, certification, or any combination of these
PG	performance grade
PVC	Polyvinyl Chloride
RAP	reclaimed asphalt pavement
RCP	reinforced concrete pipe
RFI	request for information
RWQCB	Regional Water Quality Control Board
SCM	Supplementary Cementitious Material
SWPPP	storm water pollution prevention plan
TV	target value
UL	Underwriters Laboratories, Inc
WPCP	water pollution control program

[a]Interpret a reference to AWS as a reference to AWS, ANSI/AWS, or AASHTO/AWS

Bid Item List Abbreviations

Abbreviation	Meaning
ACRE	acre
CF	cubic foot
CY	cubic yard
EA	each
(F)	final pay item
GAL	gallon
H	hour
LB	pound
LF	linear foot
LS	lump sum
STA	station (100 feet)
SF	square foot
SQYD	square yard
TON	2,000 pounds
WDAY	working day

1-3 Definitions and Terms

The definitions and terms as used in these Standard Specifications and Contract Documents shall be interpreted and understood as established in this Section 1:

1-3.1 Acceptance

The formal acceptance by the City Council of an entire contract, which has been completed in all parts and requirements in accordance with the Contract Documents and any modifications thereof, previously approved. The "Notice of Completion" shall mean the document recorded with the Tulare County Recorder indicating the formal acceptance of a specified Contract.

1-3.2 Addenda

Written interpretations or revisions to any of the Contract Documents issued by the City before the bid opening.

1-3.3 Base

A layer of specified material of planned thickness placed immediately below the pavement or surfacing.

1-3.4 Basement Material

The material in excavation or embankments underlying the lowest layer of subbase, base, pavement, surfacing or other specified layer which is to be placed. See Section "Subgrade."

1-3.5 Bid

The proposal submitted by the Contractor in response to the invitation to bid made by the City.

1-3.6 Bid Book or Bid Document

These terms shall have the same meaning as Construction Specifications.

1-3.7 Bidder

Any individual, firm, partnership, corporation, or combination thereof, submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.

1-3.8 California Manual On Uniform Traffic Control Devices (California MUTCD)

The most current adopted version of The California Manual on Uniform Traffic Control Devices for streets and highways, and amendments thereto, hereinafter referred to as California MUTCD or CA MUTCD. Supersedes the MUTCD and MUTCD California Supplement.

1-3.9 Certificate of Compliance

Certificate stating the material complies with the Contract Documents.

1-3.10 Certified Testing Laboratory

An established laboratory properly certified and approved by the Community Development Director to test materials, specimens, or work involved in the Standard Specifications and Contract Documents, and as specified herein.

The materials laboratory shall be under the responsible management of a California Registered Engineer with experience in sampling, inspection and testing of construction materials. The Engineer shall certify the results of all tests performed by laboratory personnel under the Engineer's supervision. The materials laboratory shall contain certified test equipment capable of performing the tests required.

The materials laboratory used shall provide documentation that the laboratory complies with the following procedures:

A. Correlation Testing Program

The materials laboratory shall be a participant in one or more of the following testing programs:

1. AASHTO Materials Reference Laboratory (AMRL)
2. Cement and Concrete Reference Laboratory (CCRL)
3. Caltrans' Reference Samples Program (RSP)

B. Certification of Personnel

The materials laboratory shall employ personnel who are certified by one or more of the following:

1. Caltrans District Materials Engineer
2. Nationally recognized non-Caltrans organizations such as the American Concrete Institute, Asphalt Institue, National Institute of Certification of Engineering Technologies, etc.
3. Other recognized organizations approved by the State of California and/or Recognized by local governments or private associations.

C. Laboratory and Testing Equipment

The materials laboratory shall only use laboratory and testing equipment that is in good working order. All such equipment shall be calibrated at least once each year. All testing equipment must be calibrated by impartial means using devices of accuracy traceable to the National Institute of Standards and Technology. A decal shall be firmly affixed to each piece of equipment showing the date of the last calibration.

1-3.11 Change Order

An order approved by the City of Visalia Change Order Committee and issued to the Contractor amending the Contract Documents.

1-3.12 City (Owner)

The City of Visalia, California, acting as a municipal corporation and/or a trustee for improvement districts within the City. The term "Owner" and "City" shall have the same meaning.

1-3.13 City Clerk

The legally authorized City Clerk of the City of Visalia, California.

1-3.14 City Council

The City Council of the City of Visalia, California.

1-3.15 City Specifications

The City of Visalia Engineering Standard Specifications and other specifications included in them by virtue of reference, as amended from time to time.

1-3.16 City Standard Drawings or City Standard Plans

The City of Visalia Engineering Design & Improvement Standards, as amended from time to time.

1-3.17 Completion

A. For purposes of a Notice of Completion and Civil Code sections 9200-9208, "completion" means the date of acceptance of the Work as complete by the City Council. The Notice of Completion shall comply with the requirements of Civil Code sections 8100-8118.

B. For purposes of retention release under Public Contract Code section 7107, "completion" means any of the following:

1. The occupation, beneficial use, and enjoyment of a work of improvement, excluding any operation only for testing, startup, or commissioning, by the public agency, or its agent, accompanied by cessation of labor on the work of improvement.
2. The acceptance by the public agency, or its agent, of the work of improvement.
3. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 100 days or more, due to factors beyond the control of the contractor.
4. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 30 days or more, if the public agency files for record a notice of cessation or a notice of completion.

C. For all other purposes (including but not limited to assessment of liquidated damages), "completion" means the point where Contractor has fully and correctly performed all Work in all parts and requirements in accordance with the Plans, Specifications and the Contract Documents, a Final Inspection has been made, all corrective and punch list Work has been performed, all improvements and equipment are in a fully functioning condition, and the Engineer has certified that the Work is ready for acceptance by the City Council. "Completion" does not mean substantial completion or any other form of partial or insufficient performance of the Work.

1-3.18 Contract or Contract Documents

The written agreement covering the performance of the work and the furnishing of labor, materials, tools and equipment in the construction of the work. The Contract or Contract Documents shall include the Contract Agreement, Notice to Contractors, Bid Proposal, Subcontractors List, Plans, the Standard Specifications by virtue of reference, the Construction Specifications, Special Provisions, Description of Bid Items, State & Federal Funding Requirements, Appendices, Contract Bonds, Addenda, documents incorporated by reference, Permits, attached exhibits and documents, and any and all supplemental agreements amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments or extensions to the contract and include contract Change Orders.

1-3.19 Construction Specifications or Contract Specifications

The booklet containing the Notice to Contractors, Bid Proposal, Subcontractors List, Bidder's Bond, Standard Specifications by virtue of reference, Special Provisions, Description of Bid Items, State & Federal Funding Requirements, Appendices, documents incorporated by reference, and any other exhibits and documents which may be added to the booklet.

1-3.20 Contractor

The person or persons, firm, partnership, corporation or combination thereof, private or municipal, who have entered into a contract with the City, as party or parties of the second part or his or their legal representative.

1-3.21 Days

Unless otherwise specified in these Standard Specifications or the Contract Documents, "days" mean calendar days.

1-3.22 Divided Roadway

A roadway with separated traveled ways for traffic, generally in opposite directions.

1-3.23 Encroachment

Any structure or object of any kind or character placed, without the authority of law, either in, under, or over any City right of way. An encroachment can include, but not be limited to, any tower, pole, pole line, pipe, pipeline, driveway, fence, stand, private roadway, billboard or sign.

Encroachments can also include special events conducted in or on City rights of way, such as street festivals, sidewalk sales, community-sponsored events or activities, or community-approved activities. See "Permit."

Encroachments also include any construction activities in or on City rights of way or other City property.

1-3.24 Engineer

The Engineer of the City of Visalia, California, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

1-3.25 Engineer's Estimate

The list of estimated quantities of work to be performed as contained in the Bid Proposal Form.

1-3.26 Engineer of Record or Design Engineer

The Engineer in responsible charge of designing and engineering the Plans and Construction Specifications.

1-3.27 Extra Work

Any obligations, construction, or service outside the scope of the contract.

1-3.28 Final Pay Item

See Section 9-3 "Final Pay Items" for a full description.

1-3.29 Finish Grade

The elevation or slope shown on the plans assigned to the design finished surface of an improvement, including earthwork which will receive no paving or other surfacing, after all work on the improvement has been completed.

1-3.30 Grading Plane

The surface of the basement material (subgrade) upon which the lowest layer of subbase, base, pavement, surfacing or other specified layer is placed.

1-3.31 Inspector

A duly authorized agent of the Engineer.

1-3.32 Laboratory or Testing Laboratory

See "Certified Testing Laboratory".

1-3.33 Legal Holidays

Those days designated as City holidays by the Visalia City Council in observance of which City offices are closed.

1-3.34 Line and Grade

The term used to describe the horizontal and vertical lines, elevations and slopes shown on the plans to which all improvements and earthwork are to be constructed.

1-3.35 Liquidated Damages

The amount prescribed in the Special Provisions to be paid to the City or to be deducted from any payments due or to become due the Contractor for each day's delay in completing the whole or any specified portion of the work beyond the time allowed in the Contract Documents.

1-3.36 Median

That portion of a divided roadway separating the traveled ways for traffic in opposite directions including inside shoulders, if any. Medians may be raised or un-raised, paved or unpaved.

1-3.37 Non-Public Work or Non-Public Project

Any improvement being completed by developers, utility companies, other agencies, or any other individual, group, business, or entity within the City of Visalia street right of way or on other City of Visalia property that is not being funded and managed by the City as a public project.

1-3.38 Notice of Award

The document issued to the Contractor along with the official Contract Documents package after the Contract award is issued by the Visalia City Council.

1-3.39 Notice to Proceed

The document issued to the Contractor, after all Contract Documents have been signed and pre-construction contract requirements have been met, authorizing the Contractor to start construction.

1-3.40 Pavement

The uppermost layer of material placed on the traveled way or shoulders. This term is used interchangeably with surfacing.

1-3.41 Permit

As used in these Standard Specifications, the document issued by a jurisdictional agency specifying the terms and conditions under which the permittee is authorized to perform certain work typically associated with a Contract awarded by the City. Permits may be issued by one or more agencies which have jurisdiction by law or by ownership over various aspects of the work. Permits may take the form of providing authorization to perform general roadwork, to install, construct, or repair certain encroachments, or govern such things as air pollution and storm water pollution prevention. The term "Encroachment Permit" describes the permit issued by the City Engineering Division and does not apply to Building Permits issued by the City Building Division. See "Encroachment."

1-3.42 Permittee

The person or persons, partnership or corporation, private or public, who has obtained a permit from the City or other jurisdictional agency and who has agreed to do work encompassed by said permit in conformance with the requirements thereof.

1-3.43 Plans

The official Construction Plans which show the location, character, dimensions and details of the work to be performed. Standard Drawings (sometimes referred to as Standard Plans), profiles, typical cross sections, working drawings and supplemental drawings, or reproductions thereof, approved by the Engineer, are to be considered as a part of the Plans. As used in this definition, the term Standard Drawings refers to the City of Visalia Engineering Design & Improvement Standards.

1-3.44 Private Developer

An individual or group proposing to subdivide or improve land within the City and constructing or causing to be constructed improvements to be accepted by the City.

1-3.45 Proposal

The written offer of the bidder for the work when made out and submitted on the prescribed proposal form, properly signed and guaranteed.

1-3.46 Proposal Form (Also referred to as Bid Proposal)

The approved document upon which the City requires formal bids be prepared and submitted for the work.

1-3.47 Proposal Guaranty

The cash, cashier's check, certified check or bidder's bond accompanying the proposal submitted by the bidder, as a guarantee that the bidder will enter into a contract with the City for the performance of the work if the contract is awarded to the bidder.

1-3.48 Public Work or Public Project

Any improvement being funded and managed by the City of Visalia.

1-3.49 Right of Way

The whole right of way or area which is reserved for and secured for use in constructing the roadway and its appurtenances.

1-3.50 Roadbed

The roadbed is that area upon which a traveled surface will be installed, generally between curbs delineating the edges of the traveled way. The roadbed rises in elevation as each increment or layer of subbase, base, surfacing or pavement is placed.

1-3.51 Roadway

That portion of the right of way included between the outside lines of sidewalks, or curbs, slopes, ditches, or channels, including all the appertaining structures, and other features necessary for proper drainage and protection.

1-3.52 Shoulders

The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses. Shoulders may be paved or unpaved.

1-3.53 Special Provisions

The Special Provisions and other specifications included in them by virtue of reference.

1-3.54 Specifications

Where used, the term “Specifications” without modifier shall mean collectively these Construction Specifications and the Standard Specifications, embodying all the applicable specification documents therein.

1-3.55 Standard Drawings or Standard Plans

The City of Visalia Engineering Design & Improvement Standards, as amended from time to time.

1-3.56 Standard Specifications

The City of Visalia Engineering Standard Specifications and other specifications included in them by virtue of reference, as amended from time to time.

1-3.57 State of California Standard Specifications

The 2010 version of the Standard Specifications issued by the Department of Transportation (Caltrans) of the Business, Transportation and Housing Agency of the State of California.

1-3.58 State

The State of California Department of Transportation. This term is used interchangeably with Caltrans and has the same meaning.

1-3.59 State Standard Plans

The 2010 version of the State of California, Department of Transportation Standard Plans.

1-3.60 State Standard Specifications

The 2010 version of the Standard Specifications issued by the Department of Transportation (Caltrans) of the Business, Transportation and Housing Agency of the State of California.

1-3.61 Subbase

A layer of specified material of planned thickness between a base and the basement material.

1-3.62 Subgrade

That portion of the roadbed on which pavement, surfacing, base, subbase, or a layer of any other material is placed. See "Basement Material."

1-3.63 Substantial Completion

Substantial completion shall refer to a stage of construction where the Contractor has fully and correctly performed all Work in all parts and requirements in accordance with the Plans, Standard Specifications and the Contract Documents, all improvements and equipment are in a fully functioning condition, the Contractor has performed the final cleanup, and the project is ready for final inspection.

1-3.64 Surety

"Surety" or "Corporate Surety" refers to a corporate surety company included on the State of California, Department of Insurance, Admitted Sureties List, most current edition, and acceptable to the City.

1-3.65 Surfacing

The uppermost layer of material placed on the traveled way, or shoulders. This term is used interchangeably with pavement.

1-3.66 Traffic Lane

The portion of a traveled way for the movement of a single line of vehicles.

1-3.67 Traveled Way

The portion of the roadway for the movement of vehicles, generally between faces of curbs.

1-3.68 Unauthorized Work

Work performed beyond the lines and grades described in the Contract or established by the Engineer or extra work performed without authority.

1-3.69 Work

All the obligations and construction specified, indicated, shown, required or contemplated in the Contract Documents, including all alterations, amendments or extensions thereto made by Contract Change Order or other written orders of the Engineer, and including all punch list, corrective work, as-built or as-constructed drawings, and manuals at the end of the construction. The Work shall not include work being performed by the Owner (by itself or through other contractors) that is merely related to the Work.

1-3.70 Working Days

Unless otherwise designated, working day as used in these Standard Specifications and Contract Documents shall mean any day on which the Contractor is not prevented by inclement weather, or conditions resulting therefrom, from proceeding with substantial prosecution of the work, excluding Saturdays, Sundays, legal holidays, and any other day the Contractor is specifically required by the Special Provisions to suspend construction operations.

1-4 References

Where the version of a referenced document is not specified, use the current version in effect on the date of the Notice to Contractors.

State Specifications

Whenever the State Specifications are referenced and terms are used, they shall be understood to mean the following:

"State," or "Department," shall mean "City".

Where "State Highway Engineer" and "Engineer" are used, it is understood that they refer to and mean, the City Engineer of the City of Visalia or his authorized delegate.

Laboratory – For Public projects, the designated laboratory authorized/hired/selected by the City of Visalia to test materials and work involved in the contract. For Non-Public projects the designated laboratory hired by the entity responsible for the project and approved by the City of Visalia.

For terms, specifications, and requirements appearing in the State Specifications and the Contract Documents, the terms, specifications, and requirements in the Contract Documents shall take precedence.

SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS

2-1 General

The City Purchasing Division will receive at the Front Counter at City Hall West, 707 W. Acequia, Visalia, California, 93291 prior to the hour and day specified in the "Notice to Contractors", sealed proposals for furnishing materials, supplies, equipment and labor for performing the work as specified in the Plans, the Specifications, and the Contract Documents. Proposals submitted at or after the hour specified for receipt of bids will be returned unopened.

2-2 Examination of Site of Work, Plans, Specifications and Contract Documents

The bidder is required to carefully examine the site of the proposed work and the Contract Documents, Plans and Specifications for the work contemplated. The work embraced herein shall be done in accordance with the Contract Documents.

Bid submission shows the bidder has investigated the site and is satisfied as to the conditions to be encountered and the scope of work, and understands the requirements of the Plans, Specifications, and other Contract Documents. Bid submission is your acknowledgment that you have examined the job site, plans, construction specifications, and bid documents and are satisfied with:

A. General and local conditions to be encountered

B. Character, quality, and scope of work to be performed

C. Quantities of materials to be furnished

D. Character, quality, and quantity of surface and subsurface materials or obstacles

E. Requirements of the Contract

Prospective bidders must satisfy themselves, by such means as they prefer, as to local conditions and all other matters which influence their bid for the work. The City or Engineer shall not be liable on account of any obstructions of any nature, unforeseen difficulties in construction, or unreliable information from any source.

It is the Contractor's responsibility to inform the Engineer and seek correction or clarification upon discovering any error or omission in the Plans, Specifications, or other Contract Documents prior to proceeding with the described work. The Contractor will be liable for any resultant damage where he "recognized such error, inconsistency or omission and knowingly failed to report it to the Engineer". The Contractor will bear no liability for any errors which he discovers and reports to the Engineer.

Existing improvements visible at the job site, for which no specific disposition is made on the Plans, but which could reasonably be assumed to interfere with the satisfactory completion of the improvements contemplated by the Plans, shall be removed and disposed of by the Contractor at his expense.

The locations of existing facilities that are shown on the Plans are approximate. Exact locations of existing utilities shall be determined by the Contractor by whatever means necessary, including hand digging, with the possible assistance of the utility companies and located in the field by the Contractor prior to the construction of any improvements required by the Contract. Any additional cost incurred because of the Contractor's failure to field verify locations of existing utilities prior to construction shall be paid for by the Contractor.

2-3 Form of Proposal

All proposals must be submitted upon the blank forms included in this bid document which can be obtained from the City Purchasing Division at City Hall West, 707 W. Acequia, Visalia, California, 93291. This bid document must be submitted in its entirety with no pages removed. All addendums issued during the bidding process must be signed and submitted with the bid document. The bid document contains a contract that will be used with the bid proposal. A separate bid bond with appropriate attachments may be stapled to the inside front cover of the bid document in lieu of using the forms provided in the Section "Bidders Bond." All proposals must give the unit price where indicated, or lump sum where unit prices are not called for, for each of the items. Proposals are to be filled out completely and must be signed by the bidder with his address, all as indicated on the proposal form. If the proposal is made by an individual, his name and post office address must be shown. If made by a firm or partnership, the name and post office address of each member of the firm or partnership must be shown. If made by a corporation, the proposal must show the name of the state under the laws of which the corporation was chartered and the names, titles and business address of the president, secretary, treasurer and manager thereof. The Bid Proposal Form includes the following documents, all of which are to be completed in all respects and submitted as a complete package: Bid Proposal, Bid Proposal Contract, Bid Schedule, Bidder's Information, Subcontractors List, Contractor's Reference Form, Non collusion Affidavit, Drug Free Workplace Certification and Bid Security. Depending on the nature of the project, other documents may be included by the City and shall be completed in all respects and submitted by the bidder with the Bid Proposal Form or as otherwise indicated by the City. All proposals must be submitted under sealed cover. See the Notice to Contractors for additional proposal requirements.

All other forms, exhibits, certifications, declarations, and other documents included in the bid book must be completed by the Contractor and submitted with the bid.

2-4 Conflict of Interest

No employee of the City shall be eligible to submit a proposal for, or to subcontract for any portion of, or to supply any materials for any contract administered by the City.

2-5 Quantities

The estimates of the quantities of work to be performed and materials to be furnished given in the Notice to Contractors, Bid Proposal and in the Construction Specifications are approximate only, being given as a basis for the comparison of bids. The City does not expressly or by implication agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work or to omit portions of the work that may be deemed necessary or expedient by the Engineer. Reference is made to Section 4-10, "Changes," regarding changes to quantities.

2-6 Unit or Lump Sum Prices

The unit or lump sum prices inserted in the bid form by the bidder will be considered to be the bid prices for the various bid items of work performed. In case of a discrepancy between the unit price bid and the calculated total for any bid item, the unit price shall govern. In case of a discrepancy between the unit or lump sum price in words and figures provided on the Bid Proposal, the lump sum or unit price quoted in words shall prevail.

2-7 Proposal Guaranty

All bids shall be presented under sealed cover and shall be accompanied by either a cash, cashier's check, certified check, or Bidder's Bond of a corporate surety authorized to do business in the State of California and acceptable to the City, made payable to the City of Visalia for an amount equal to at least ten percent (10%) of the amount of said bid. No bid shall be considered unless such cash, cashier's check, certified

check, or Bidder's bond is enclosed herewith. Checks or bonds must be made payable to the City of Visalia, such securities to be retained by the City as a guarantee that the Bidder, if his bid is accepted, will enter into a satisfactory contract within ten (10) days, not including Saturday, Sundays and legal holidays, from the date that the bidder has received notice that the contract has been awarded "Notice of Award" is mailed or e-mailed to the Bidder, and will furnish a good and sufficient bond for faithful performance thereof and for payment of labor and material costs in accordance with the requirements of the Contract Documents.

2-8 Designation of Subcontractors

The Contractor shall comply with the California Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the State Public Contract Code. The Contractor shall file with the bid the name and address of each subcontractor who will perform more than one-half of one percent (½ %) of the contract amount, or in the case of a project designated by the City as a Street Project, one half of one percent of the contract amount or ten thousand dollars ($10,000), whichever is greater. To determine the value of work subcontracted, where an entire item is subcontracted, the value of work subcontracted will be based on the contract item bid price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the contract item bid price, determined from information submitted by the Contractor, subject to approval by the Engineer.

Only one subcontractor shall be listed for each portion of the work. The portion shall be defined as to its nature and extent. The failure of the Contractor to specify a subcontractor constitutes a statement that the Contractor is qualified and intends to perform said work.

Designation of subcontractors must be made upon forms included with the bid package or to be obtained from the office of the City Engineer at City Hall. The bidder must give the names of all the subcontractors and the form must be signed by the bidder.

The Contractor must have the consent of the City and approval of the Engineer, in writing, to substitute a subcontractor other than that designated in the original bid, to permit any subcontract to be assigned or transferred, to allow a subcontract to be performed by other than the original subcontractor, or to subcontract work for which no subcontractor was designated in the original bid and which is more than one-half of one percent (½ %) of the contract amount, or in the case of a City-designated Street Project, one half of one percent or ten thousand dollars ($10,000), whichever is greater.

Violation of any of the above provisions is a violation of the Contract and cause for ordering any unapproved subcontractor from the work site. The Contractor shall comply with Section 8-3, "Subcontracting," which contains additional regulations regarding subcontractors.

2-8.1 City Right to Reject Subcontractors

Pursuant to state law City may reject subcontractors that the City has determined to not be a responsible contractor and require Contractor to substitute that specific subcontractor.

2-9 Rejection of Non-Responsible Subcontractors

Any bid may be withdrawn at any time prior to the time fixed in the "Notice to Contractors" for the opening of bids only upon written request for the withdrawal of the bid filed with the City. The request shall be executed by the Bidder or his duly authorized representative. The withdrawal of the bid does not prejudice the right of the Bidder to file a new bid. A bid will not be received after the time, nor any bid withdrawn after the time fixed in the public notice for the opening of bids until either all bids are rejected, or until the expiration of sixty (60) days set from the date set for the opening of bids, or until the contract

has been executed and the required Contractor's bonds furnished by the successful Bidder or Bidders, whichever occurs first.

2-10 Opening of Proposals

Proposals will be opened and read publicly at the time and place indicated in the "Notice to Contractors". Bids will be opened identifying Bidder and amount. Bidders, or their authorized agent, are invited to be present. City will review bid package for completeness and accuracy subsequent to opening.

2-11 Relief of Bidders

The provisions of Public Contract Code Sections 5100 to 5110, inclusive, applies to all Contracts. If the bidder claims a mistake was made in the bid presented, the bidder shall give the Engineer written notice within 5 days after the opening of the bids of the alleged mistake, specifying in the notice in detail how the mistake occurred.

2-12 Rejection of Proposals

The City reserves the right to reject any or all proposals. Proposals may be rejected if they show any alteration of form, additions not called for, conditional or alternative bids, incomplete bids, erasures, or irregularities of any kind. Proposals in which the prices are obviously unbalanced may be rejected. The City may reject all bids for budgetary reasons.

More than one proposal from an individual, a firm or partnership, a corporation or an association under the same or different names, will not be considered. Reasonable grounds for believing that any bidder that submitted a bid as a General or Prime Contractor is interested in more than one proposal for a Project will cause the rejection of all proposals in which such bidder is interested. A Contractor who is not submitting a bid as the General or Prime Contractor may submit any number of sub-bids to competing General or Prime Contractors.

This bid document must be submitted in its entirety with no pages removed. All addendums issued during the bidding process must be signed and submitted with the bid document.

A Bid Protest/Dispute/Challenge must be submitted in writing within 5 working days from award of the project to:

Purchasing
707 W. Acequia Avenue
Visalia, CA 93291

2-13 Ineligibility to Contract

The City requires all bidders to comply with the requirements of Public Contract Code Section 10285.1. The City shall have the same rights as a State Agency under Section 10285.1, which provides as follows:

"Any state agency may suspend, for a period of up to three years from the date of conviction, any person from bidding upon, or being awarded, a public works or services contract with the agency under this part or from being a subcontractor at any tier upon the contract, if that person, or any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, has been convicted by a court of competent jurisdiction of any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Section 1101, with any public entity, as defined in Section 1100, including, for the purposes of this article, the Regents of the University of California or the Trustees of the California State University. A state agency may determine the eligibility of any person

to enter into a contract under this article by requiring the person to submit a statement under penalty of perjury declaring that neither the person nor any subcontractor to be engaged by the person has been convicted of any of the offenses referred to in this section within the preceding three years".

2-14 Contractor Qualification Requirements

All Contractors, General Contractors and Subcontractors, working on non-public and public projects within City of Visalia street right of way or other City of Visalia property shall have a minimum of three years of past experience with projects of a similar size and nature to the proposed project unless otherwise approved by the City Engineer. The burden of proof shall be the responsibility of the Contractor. All General Contractors shall be required to submit a complete CONTRACTOR'S REFERENCE FORM with their bid. A blank copy of this form is located in the front end portion of the bidding documents. At the request of the Engineer, the General Contractor shall provide completed CONTRACTOR'S REFERENCE FORMS for any Subcontractor within 4 working days of the request by the Engineer. The Engineer may also request any additional information they deem necessary to verify that the Contractor or Subcontractor has the qualifications and experience to adequately perform the work required by the City in a responsible manner. Additional information may include but is not limited to license certificates, safety certificates, specialty certificates, project construction value, and change order cost percentages for past projects. Additional information shall be provided to the Engineer within 4 working days of the request. Failure to provide the requested information will result in a non-responsive bid.

SECTION 3 AWARD AND EXECUTION OF CONTRACT

3-1 Award of Contract

The award of the Contract, if it is awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements described. For projects with no alternates, the award shall be determined by comparing the base bids. When alternative bids are included in the bid proposal, the award shall be determined by comparing the lowest totals of the base bid plus the bids of those alternatives specifically identified in the bid proposal to be used for the purpose of determining the lowest bid. The City reserves the right to add or subtract any of the alternatives after the lowest bid has been determined.

The award, if made, will be made within fifty (50) calendar days after the opening of the proposals. If the lowest responsible bidder refuses or fails to execute the Contract, the City may award the Contract to the second lowest responsible bidder; the award, if made, will be made within sixty (60) calendar days after the opening of the proposals. If the second lowest responsible bidder refuses or fails to execute the Contract, the City may award the Contract to the third lowest responsible bidder; the award, if made, will be made within seventy-five (75) calendar days after the opening of the proposals. The periods of time specified above may be subject to extension for further periods as agreed upon in writing between the City and the bidder concerned.

All bids will be compared on the basis of the Engineer's Estimate of quantities of work to be done as shown in the bid proposal. Bids shall be submitted on base bids and all alternate bids, if any, in order to be considered responsive.

3-2 Execution of Contract

Four (4) sets of the contract shall be signed by the successful Bidder and returned together with the contract bonds and insurance, within ten (10) days, not including Saturdays, Sundays and legal holidays, after the Bidder has received notice that the contract has been awarded. No proposal shall be considered binding upon the City until the execution of the contract by all parties, including the City.

Failure to execute and submit the Contract within (10) days, not including Saturdays, Sundays and legal holidays after the bidder has received notice that the Contract has been awarded, shall be just cause for the annulment by the City of the award and the forfeiture of the proposal guarantee as liquidated damages. The Contractor shall submit to the Engineer along with the executed Contract, the documents required in Section 3-3, “Required Contract Securities, Insurance Certificate, Business Tax Certificate, Injury and Illness Prevention Plan,” and Section 7-4, “Contractor’s Insurance Requirements and Hold Harmless.”

3-3 Required Contract Securities, Insurance Certificate, Business Tax Certificate, Injury And Illness Prevention Plan

The bidder to whom the Contract has been awarded will be required to furnish a Labor and Material Bond equal to one hundred percent (100%) of the Contract price, and a Faithful Performance Bond equal to one hundred percent (100%) of the Contract price. Said bonds shall be secured from a corporate surety, and are to be submitted to the Engineer with the executed Contract. Corporate Sureties are to comply with the definition of “Surety” as listed in Section 1-3.

In addition to furnishing the above required sureties, the bidder to whom a contract has been awarded shall furnish and submit with the executed contract original Insurance Certificates indicating coverage in compliance with Section 7-4, “Contractor’s Insurance Requirements and Hold Harmless.”

The Contractor shall comply with Section 7-10, “Permits and Licenses.” The Contractor to whom the contract is awarded, and all Subcontractors listed on the Contractor’s Bid Proposal, or any Subcontractor

substituted or added after a contract is awarded and in accordance with these Specifications, must obtain a City of Visalia Business Tax Certificate and pay all fees associated therewith. Business Tax Certificates are to be obtained from the City of Visalia Community Development Department, 315 E. Acequia Avenue, Visalia, CA 93291, call 559-713-4326 for questions. Bidders must contact the Community Development Department to determine fee amounts prior to submitting a bid. This requirement applies regardless of the business address or location of the Contractor or any Subcontractor. Evidence showing the Contractor and all subcontractors have obtained a City of Visalia Business Tax Certificate shall be submitted to the Engineer with the executed Contract.

In compliance with Section 7-12 "Safety Provisions; First Aid; Injury and Illness Prevention Program," the Contractor shall submit with the above documents a copy of the Contractor's Injury and Illness Prevention Plan when requested by the Engineer.

The Contractor shall arrange to have a maintenance bond in effect for a period of one year after the date of recordation of the Notice of Completion. The maintenance bond shall be in an amount equal to ten percent (10%) of the final contract amount and shall be delivered to the Engineer prior to the City acting on the project final acceptance.

3-4 Return of Proposal Guarantees

Within ten (10) days after the award of the contract, the Purchasing Division will return the proposal guarantees, other than Bidder's bonds, accompanying such of the proposals which are not to be further considered in making the award. All other proposal guarantees will be held until the contract has been finally executed, after which all proposal guarantees, except those forfeited, will be returned to the respective Bidders whose proposal they accompany.

3-5 Material Statement, Samples, and Guarantees

As permitted in Section 6, "Control of Materials," before any Contract is awarded, the bidder may be required to furnish a complete statement of the origin, composition, and manufacturer of any or all materials to be used in the construction of the work together with samples which may be subjected to the tests provided for in these Specifications to determine their quality and fitness for the work.

In compliance with Sections 5-23, "Guarantee of Workmanship," 6-10, "Guarantee of Materials," and 7-23, "Guarantee," the Contractor is required to guarantee all materials, equipment and workmanship for a period of one year from the date of Acceptance as denoted in Section 8-14, "Acceptance of Contract." In addition to the overall guarantee, the bidder may also be required by the Contract Specifications to furnish a written or other form of guaranty such as a bond covering certain items of work for varying periods of time from the date of recordation of said Notice of Completion. When the guaranty is required, the form and the time limit of the guaranty shall be as specified in the Contract Specifications. The signed written guaranty or the bond, whichever is required by the Contract Specifications, shall be delivered to the Engineer before Acceptance of the Contract.

All costs for compliance with this Section 3-5 shall be included in the various bid items; no additional payment will be made therefor.

SECTION 4 SCOPE OF WORK

4-1 Intent of Plans and Specifications

The intent of the Plans and Specifications is to prescribe the details for the construction and completion of the work which the Contractor undertakes to perform in accordance with the terms of the contract. Where the Plans or Specifications describe portions of the work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. The Contractor shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in completing all of the contract requirements in a satisfactory and workmanlike manner.

The Plans, Specifications and other Contract Documents will govern the work. Anything in the Specifications and not on the Plans, or on the Plans and not in the Specifications, shall be as though shown or mentioned in both.

The Contractor shall keep at the worksite a copy of the Plans and Contract Specifications, to which the Engineer shall have access at all times.

While it is believed that much of the information pertaining to physical conditions which may affect the cost of the proposed work will be shown on the Plans or indicated in the Contract Specifications, the City does not warrant the completeness or accuracy of such information. The Contractor shall ascertain the existence of any such conditions affecting the cost of the work which would have been disclosed by reasonable examination of the site.

No test, investigation, statement or estimate of a factual situation not incorporated in the Contract Documents shall be relied on by the Contractor. Any test, investigation, statement, or estimate of fact incorporated in the Contract shall be considered by the Contractor to be a suggestion only and he shall request equal access to the underlying or background informative material or source and shall arrive at his own opinion thereon, including his determination of how reliable might be any conclusion appearing in or inferred from the Contract Documents.

In general, the Plans will indicate dimensions, position and kind of construction, and the written Specifications will indicate qualities and methods. Any work indicated on the Plans and not mentioned in the written Contract Specifications, or vice versa, shall be furnished by the Contractor as though fully set forth in both. Work not particularly detailed, marked or specified, shall be as similar parts that are detailed, marked or specified.

All alterations authorized by the Engineer which affect the requirements and information given on the approved plans shall be in writing. No changes shall be made in any plan or drawing after the same has been approved by the Engineer, except by direction of the Engineer.

During the course of the work, if the Contractor discovers any discrepancies between the Plans and the conditions in the field, or any errors or omissions on the Plans or in the Specifications which will significantly affect the work, it shall be the Contractor's duty to inform the Engineer immediately in writing, and the Engineer shall promptly verify the same. Any work done after such discovery, until authorized, will be done at the Contractor's risk and will be considered unauthorized work.

4-2 Coordination, Interpretation, and Precedence of Plans and Specifications

The Plans, Specifications, and all supplementary documents are essential parts of the Contract and a requirement occurring in one is as binding as though occurring in all. They are intended to be cooperative, to describe, and to provide for a complete work.

Whenever any conflict appears in any portions of the Contract Documents, it shall be resolved by application of the order of precedence given below, unless the Engineer shall order otherwise.

Change Orders and Supplemental Agreements;
Contract Agreement;
Pre-bid Addenda;
State & Federal Funding Requirements;
Special Provisions;
Construction Specifications excluding Standard Specifications;
Contract Construction Plans or Drawings;
Description of Bid Items;
City of Visalia Encroachment Permit Policy Manual;
Standard Specifications (including General Provisions);
City Standard Drawings;
Any other referenced and incorporated specifications;
Any other referenced and incorporated plans or drawings.

Detailed plans and specifications shall take precedence over standard plans and specifications, even within the same level of precedence. Dimensions called out on the Plans shall control and supersede scaled dimensions. No scaled dimension shall be used in the execution of the work, unless no dimension is called out on the Plans and the use of a scaled dimension is authorized by the Engineer.

For State or Federally funded projects the specifications and requirements listed in the section titled "State & Federal Funding Requirements," shall take precedence over other Standard Specification requirements.

4-3 Interpretations

Should it appear that the work to be done, or any matter relative thereto, is not sufficiently detailed or explained on the Plans or Specifications, the Contractor shall apply to the Engineer for such further explanations as may be necessary, and shall conform to such explanation or interpretation as part of the Contract, so far as may be consistent with the intent of the original Plans and Specifications. In the event of doubt or question relative to the true meaning of these documents, reference shall be made to the Engineer, whose decision thereon shall be final.

All requests for information shall be submitted on the City's Request for Information (RFI) form and each request shall be numbered starting with number one. The RFI shall provide a clear description of the clarification needed, reference the documents in question, verify if Contractor believes extra time or cost will be required, and include other attachments as necessary. By submitting the RFI the Contractor certifies that he has thoroughly reviewed the contract documents and determined that the information requested was not contained in the Contract Documents. The City will be responsible for responding to the RFI within ten (10) working days, unless this time period is extended by mutual agreement between the City and the Contractor. In the event the Contractor believes that a response to an RFI will cause a change to the requirements of the Contract Documents, the Contractor shall immediately give written notice to the City within five (5) working days of receipt of the RFI from the City stating that the

Contractor considers the response a change order. Failure to give such written notice shall waive the Contractor's right to seek additional time or cost.

4-4 Working Drawings

When working drawings or shop drawings are required by the Plans or Specifications, or requested by the Engineer, they shall be prepared in accordance with modern engineering practice by the Contractor at the Contractor's expense. Shop or working drawings shall be of a size and scale to clearly show all necessary details. Unless otherwise specified, four (4) copies of the shop or working drawings shall be submitted to the Engineer for approval or correction at least fifteen (15) days before approved drawings will be required for the work. If corrections are required, the Contractor shall make corrections as directed by the Engineer and shall deliver four (4) copies of the corrected shop or working drawings to the Engineer. Upon final approval, one set will be returned to the Contractor marked "accepted" or "accepted as corrected". For items requiring shop drawings, no materials shall be furnished or work done before approval of the drawings.

Acceptance of shop or working drawings by the Engineer means that there is substantial and acceptable conformance with the Plans and Specifications, but details of design may not necessarily be checked for adequacy or accuracy. An acceptance shall not relieve the Contractor from the responsibility for errors or omissions in the drawings or from deviations from the Contract Documents unless such errors, omissions, or deviations were specifically called to the attention of the Engineer in writing. The Contractor is responsible for the correctness of the shop or working drawings, for shop fits and field connections, and for the results obtained by use of such plans.

In the event of discrepancy between the scaled dimension on any drawing and the figures written thereon, the figures shall be taken as correct, unless otherwise determined by the Engineer.

4-5 Conformity with Plans and Allowable Deviations

Finished surfaces including the completed final surface of earth, concrete, pavement or other material, or the completed top of a layer of subgrade, base or surfacing, in all cases shall conform with the lines, grades, cross sections, and dimensions shown on the Plans. Where tolerances are indicated in the Specifications, the work shall be constructed within the tolerances. Variations within the specified tolerances shall be compensating so that average grade and cross section specified are met. Deviations from the Plans required by the exigencies of construction will be determined in all cases by the Engineer and authorized only in writing.

4-6 Existing Facilities and Structures Shown on Plans

Where underground and surface facilities or structures are shown on the Plans, the locations, depth and dimensions of such facilities or structures are believed to be reasonably correct, but are not guaranteed. Such facilities or structures are shown for the information of the Contractor, but information so given is not to be construed as a representation that such facilities or structures will, in all cases, be found or encountered just where shown, or that they represent all the structures which may be encountered. The Contractor shall comply with the provisions in Section 8-15, "Utility and Non-Street Facilities; Potholing."

4-7 Omissions in Plans and Specifications

Omissions from the Plans or the Specifications of the materials or details of work which are manifestly or obviously necessary to carry out the intent of the Plans and Specifications, or which are customarily furnished or performed, shall not relieve the Contractor of the responsibility for furnishing such omitted materials or performing such omitted work, but shall be furnished or performed as if fully shown or described in the Plans or Specifications.

Any materials or work mentioned in the Specifications and not shown on the Plans, or shown on the Plans and not mentioned in the Specifications, shall be of the same effect as if shown or mentioned in all.

4-8 Incorporation of Referenced Specifications

Where referenced thereto on the Plans or the Specifications, the work embraced herein shall be done in accordance with the provisions of the 2010 version of the "State of California, Department of Transportation Standard Specifications," which Specifications are hereinafter referred to as the State Standard Specifications, in accordance with the following provisions.

In case of a conflict between the City's Standard Specifications and Contract Documents and any other referenced and/or incorporated set of specifications such as the State Standard Specifications, the City's Standard Specifications and Contract Documents take precedence over and shall be used in lieu of such conflicting portions in the other specifications, in accordance with Section 4-2, "Coordination, Interpretation, and Precedence of Plans and Specifications."

4-9 Work To Be Done

The work to be performed under the Contract consists of furnishing all materials, equipment, supplies, labor and transportation, and performing all Work as required by the Contract in strict accordance with the Contract Documents in a satisfactory and workmanlike manner. The Work includes all work, material and services not expressly called for in the Contract Specifications or not shown on the Plans, but which may be necessary for completion and proper construction to carry out the Contract in good faith. The site of Work shall be left in a neat condition. All improvements shall be in a complete and operating condition. The cost of all Work performed, furnished and installed is to be included in the amount bid for the various items of Work with no separate compensation allowed therefor.

4-10 Changes

The City reserves the right to make such alterations, deviations, additions to, or deletions from the plans and specifications, including the right to increase or decrease the quantity of any item or portion of the Work or to delete any item or portion of the Work (see Section 2-5, "Quantities") as may be deemed by the Engineer to be necessary or advisable, and to require such Extra Work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated.

No adjustment will be made in the contract unit price of any bid item as a result of quantity changes, unless the quantity of the bid item is increased or decreased by more than 25 percent of the original bid item quantity. If a unit price adjustment is considered to be warranted by the Engineer, the Contractor shall be compensated in accordance with the provisions of Section 9-1.06, "Changed Quantity Payment Adjustments," of the State Standard Specifications. Any references therein to "State" or "Department" shall mean "City." The Contractor will be responsible for submitting detailed cost data for a unit price adjustment for a bid item if (1) the Engineer requests the data or (2) you request a unit price adjustment resulting from a change in accordance with this Section.

All changes will be set forth in a Contract Change Order which will specify, in addition to the work to be done in connection with the change made, adjustment of contract time, if any, and the basis of compensation for that work. The Contractor will be responsible for submitting detailed cost data including a breakdown of labor, equipment, and materials to the Engineer for approval as listed in Section 9-5 "Payment for Extra Work" and incorporation into the Change Order. A contract change order will not become effective until approved by the City of Visalia Change Order Committee.

The Contractor may seek a Change Order from the City of Visalia Change Order Committee pursuant to this Section 4-10 and Section 4-12.3.

The Contractor shall not commence work covered by the proposed change order prior to approval of the Change Order Committee, unless authorized in writing by the Engineer. The Contractor shall not be entitled to payment for any work performed without written authorization from the Engineer. Until the City approves a Change Order, the Contractor shall continue to perform the work under the Contract unless the Engineer orders the Contractor in writing to start the work described in the Change Order before its approval.

Should the Contractor disagree with any terms or conditions set forth in an approved Contract Change Order not executed by the Contractor, the Contractor shall submit a written protest to the Engineer within five (5) days after the receipt of the approved Contract Change Order and the procedures outlined in Section 4-12 apply.

If a requested change order is sent back to the Contractor for revisions, the Contractor has fifteen (15) days to resubmit. If the Contractor fails to return the revised Change Order to the Engineer within the above mentioned time period, the Contractor shall have waived its rights to compensation for said change order.

Changes shall not invalidate the contract nor release the surety, and the Contractor agrees to accept payment for such changes as if the altered work had been a part of the original contract. These changes which are for work within the general scope of the contract shall be covered by Change Orders issued by the City. Change orders for altered work shall include extensions of contract time where, in the Engineer's opinion, such extensions are commensurate with the amount and difficulty of added work.

Excessive altered work shall be covered by supplemental agreement that is subject to funding agency approval as applicable. If the City and the Contractor are unable to agree on a unit adjustment for any contract item that requires a supplemental agreement, the City reserves the right to terminate the contract with respect to the item and to make other arrangements for its completion.

For all changes, the City shall reasonably compensate Contractor with money (including overhead and profit) and/or time for any Extra Work ordered by the City to be performed; and the City shall receive a reasonable credit for money (including overhead and profit) and/or time saved by any deletion of work.

Changes by Contract Change Order, when ordered and accepted, shall be paid for in accordance with the terms of this Section 4-10 and Section 9-5, "Payment For Extra Work."

4-11 Extra Work

The Contractor is prohibited from doing Extra Work, unless authorized in writing by Engineer before the Extra Work is done. The Engineer should obtain authorization from the Change Order Committee before agreeing to Extra Work requested by the Contractor. In the instances where it is necessary for the Extra Work to be done immediately, the City Engineer may authorize the Extra Work prior to taking the additions to the Change Order Committee. The Contractor shall be responsible for submitting a cost breakdown documenting all labor, equipment, and material costs used to complete the Extra Work in accordance with Section 9-5, " Payment for Extra Work". The cost breakdown shall be submitted in a manner that is satisfactory to the Engineer and shall be submitted to the Engineer within thirty (30) days of completing the extra work. Upon review and acceptance by the Engineer, the Change Order will be submitted to the Change Order Committee. If the Contractor does not submit any documentation within this time period the Engineer may move forward with issuing a Change Order to adjust the contract price.

Payment for approved Extra Work shall be as approved by the Change Order Committee. No additional payment is due for unauthorized Extra Work.

Unless otherwise specifically indicated in the Plans or the Specifications, any work or responsibility of the Contractor set forth in the Specifications or on the Plans and not set forth as a separate bid item shall be considered incidental or appurtenant to the work and full compensation for the cost thereof included in the various bid items of work. Such work or responsibility will in no case be considered as Extra Work.

When work is classified as Extra Work by the Engineer, the Contractor shall do such Extra Work and furnish labor, materials, and equipment therefor upon receipt of an approved Contract Change Order or other written order of the Engineer, and in the absence of such approved Contract Change Order or other written order of the Engineer, the Contractor shall not be entitled to payment for such Extra Work.

Extra Work, when ordered and accepted, shall be paid for in accordance with the terms of this Section 4-11 and Section 9-5, "Payment For Extra Work."

4-12 Notices, Change Orders, and Claims

If the Contractor requests additional compensation, whether money or time, or otherwise believes that it is entitled to a modification of the Contract terms and conditions, then Contractor shall follow the procedures for pursuing such requests that are specified herein, otherwise Contractor shall have failed to pursue diligently and exhaust the administrative procedures set forth under this Agreement and shall have waived its rights to such pursue remedies under any later attempts to recover such compensation or modification.

4-12.1 Definition of "Claim"

A "Claim" is a separate demand by the Contractor for (a) a time extension, (b) payment of money or damages arising from work done by, or on behalf of, the Contractor, payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (c) an amount the payment of which is disputed by the local agency. However, a "Claim" does not include a proposed change order submitted pursuant to these provisions since a proposed change order is a less formal procedure that is preliminary to a Claim in some instances. In addition, a "Claim" does not include vouchers, invoices, progress payment applications, or other routine or authorized forms of requests for progress payments on the Contract. The responsibility to substantiate Claims shall rest with the Contractor.

4-12.2 Initial Potential Claim Record Notice Requirements

Contractor shall submit an Initial Potential Claim Record, which may also be referred to as a "Notice of Potential Claim" within five (5) days from the date of the Contractor becoming aware of the facts and/or issue creating the Claim. The Initial Potential Claim Record shall contain a description by the Contractor of the nature of claim, circumstances surrounding the claim and basis of claim. Failure to timely submit an Initial Potential Claim Record shall act as a waiver by Contractor of any right to later submit a proposed change order or pursue a Claim on that issue. Contractor acknowledges that these written notices are critical to the Owner's management of the project and the mitigation of project costs and scheduling. The City is not required to respond to the Initial Potential Claim Record, but may request additional information from the Contractor.

The Initial Potential Claim Record shall indicate whether the subject item of the claim or the "disputed work" is complete. After the Initial Potential Claim Record the Contractor shall in most instances be required to file a Supplemental Potential Claim Record and a Full and Final Potential Claim Record.

The Full and Final Potential Claim Record is required within thirty (30) days of the disputed work being completed or the filing of the Initial Potential Claim Record, whichever is later. The Full and Final Potential Claim Record is required unless the Engineer, after receipt of the Supplemental Potential Claim Record or Full and Final Potential Record requires the Contractor submit the claim as a change order to the Change Order Committee. See the following subsection for a description of claims involving change orders or decisions by the City Change Order Committee.

Throughout the disputed work the Contractor shall maintain records that provide a clear distinction between the incurred direct costs of disputed work and that of undisputed work. The contractor shall provide the Engineer access to the Contractor's project records deemed necessary by the Engineer to evaluate the potential claim upon request by the Engineer.

4-12.3 Claims Involving Change Orders

If Contractor disagrees with an approved change order issued pursuant to Section 4-10, "Changes," then Contractor shall submit an Initial Potential Claim Record within five (5) days of being notified of the approved change order.

The Contractor is also entitled to submit proposed change orders to the City of Visalia Change Order Committee pursuant to this Section 4-12.3 and Section 4-10. If Contractor otherwise believes that it is entitled to additional compensation for money and/or time (including but not limited to grant of a time extension; payment of money or damages arising from work done by, or on behalf of, the Contractor, payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to; or an amount the payment of which is disputed by the local agency), then Contractor shall submit a proposed change order within thirty (30) days of (i) becoming aware of the potential right to additional compensation, or (ii) the date by which it should have become aware of the potential right to additional compensation. Failure to timely submit a proposed change order shall act as a waiver by Contractor of any right to later submit a proposed change order or Claim on that issue. The proposed change order shall indicate the grounds for the additional compensation (money and/or time) requested and the amount of compensation (money and/or time) requested, and Contractor shall include all information supporting the proposed change order. The proposed change order shall be submitted to the City Change Order Committee for review. If the Contractor disagrees with the decision of the Change Order Committee then the Contractor shall submit an Initial Potential Claim Record within five (5) days of being notified of the Change Order Committee decision.

If the Contractor was ordered by the Engineer to have a claim reviewed by the Change Order Committee after filing a Supplemental Potential Claim or a Full and Final Potential Claim and the Contractor disagrees with the Change Order Committee decision, then within five (5) days of being notified of the Change Order Committee decision the Contractor must file another Initial Potential Claim Record indicating the disagreement and referencing the prior claim. Under this circumstance the Contractor is not required and may not file another Supplemental Potential Claim or Full and Final Potential Claim Record and instead must proceed with the dispute resolution process described in Public Contract Code Sections referenced in these specifications.

4-12.4 Supplemental Potential Claim

Within fifteen (15) days of submitting the Initial Potential Claim Record, also known as the Notice of Potential Claim, the Contractor shall, unless an exception applies, submit a Supplemental Potential Claim Record. The Supplemental Potential Claim Record shall include the following:

a. The Complete nature and circumstances causing the potential claim.
b. A description of the Contract Documents that support the basis of the claim.

c. The estimated claim cost and an itemized breakdown of individual costs stating how the estimate was determined.

The Engineer shall review the Supplemental Potential Claim and should provide an initial response within thirty (30) days of receiving the Contractor's submittal. The Engineer may request additional time to respond if necessary. If the nature, circumstances, and basis of the claim have not been reviewed by the Change Order Committee, then the Engineer may require the claim be submitted to the Change Order Committee as a change order request. The Engineer shall otherwise respond to the Contractor that the Supplemental Claim has been received and state the Contractor should file a Full and Final Potential Claim Record when the disputed work is completed. If the Engineer does not respond the Contractor is required to file the Full and Final Potential Claim Record when the disputed work is completed.

If the Engineer, after receipt of the Supplemental Potential Claim Record requires the Contractor submit a change order request to the Change Order Committee, then no Full and Final Potential Claim Record is required. If referred to the Change Order Committee after filing a Supplemental Potential Claim Record and the Contractor disagrees with the Change Order Committee decision then the Contractor shall notify the Engineer of the disagreement and the Contractor's intent to file continue the claim under the Public Contract Code. The Contractor is then required to comply with the dispute resolution procedure described in Public Contract Code Sections referenced in these specifications. See Section 4-12.6 – 4-12.7.

The Supplemental Potential Claim Record is not required if the disputed work has already been completed or is completed within fifteen (15) days of the Contractor filing the Initial Potential Claim Record. In these circumstances the Contractor shall notify the Engineer when the disputed work was completed and file the Full and Final Potential Claim Record within thirty (30) days of the completion of the disputed work.

4-12.5 Full and Final Potential Claim Record

The Contractor shall notify the Engineer that the disputed work is completed within ten (10) days of the disputed item being completed.

The Contractor shall, within thirty (30) days of the completion of the disputed work or thirty (30) days from submitting an Initial Potential Claim Record, whichever is later, submit a Full and Final Potential Claim Record which shall contain the following:

1. A detailed factual account of the events causing the potential claim, including:
   1.1. Pertinent dates
   1.2. Locations
   1.3. Work items affected by the potential claim
2. The Contract Documents supporting the potential claim and a statement of the reasons these parts support entitlement
3. If a payment adjustment is requested, an itemized cost breakdown. Segregate costs into the following categories:
   3.1. Labor, including:
      3.1.1. Individuals
      3.1.2. Classifications
      3.1.3. Regular and overtime hours worked
      3.1.4. Dates worked
   3.2. Materials, including:
      3.2.1. Invoices

3.2.2. Purchase orders
3.2.3. Location of materials either stored or incorporated into the work
3.2.4. Dates materials were transported to the job site or incorporated into the work

3.3. Equipment, including:
3.3.1. Detailed descriptions, including make, model, and serial number and the Model and Code reference listed in the Caltrans Labor Surcharge and Equipment Rental Rates book in effect when the work was performed
3.3.2. Hours of use
3.3.3. Dates of use
3.3.4. Equipment costs (hourly rates and total costs)

4. If a time adjustment is requested:
4.1. Dates for the requested time.
4.2. Reasons for a time adjustment.
4.3. Contract documentation supporting the requested time adjustment.
5. Identification and copies of your documents and copies of communications supporting the potential claim, including certified payrolls, bills, cancelled checks, job cost reports, payment records, and rental agreements
6. Relevant information, references, and arguments that support the potential claim

The City shall not consider a Full and Final Potential Claim Record that does not have the same nature, circumstances, and basis of claim as those specified in the Initial Potential Claim Record and Supplemental Potential Claim Record, if the Supplemental Record was required to be filed.

The Engineer should evaluate the information presented in the Full and Final Potential Claim Record and furnish the Contractor with a response within thirty (30) days of receipt. The Engineer's receipt of the Full and Final Potential Claim Record must be evidenced by postal return receipt or the Engineer's written receipt if delivered by hand.

The Engineer may either respond to the Contractor concerning the Final Claim, or if the nature, circumstances, and basis of the claim have not been reviewed by the City Change Order Committee, the Engineer may require the Contractor submit the matter to the City Change Committee as a change order request. The Contractor, if referred to the Change Order Committee but not satisfied with the decision of the Change Order Committee, must notify the Engineer of their intent to file continue the claim under the Public Contract Code and proceed with the dispute resolution procedure required under the Public Contract Code Sections referenced in these specifications.

If the Contractor is not satisfied with the response by the Engineer, then the Contractor may proceed with the dispute resolution procedures set forth in the Public Contract Code Sections referenced in these specifications.

4-12.6 Procedures for Claims Less than or Equal to $375,000

(Public Contract Code §20104.2)

The Contractor is required to comply with the administrative claim process described above, and if the matter is not resolved, then the Contractor is required to comply with the dispute resolution process set forth in Public Contract Code Sections 20104-20104.6.

If the Contractor disputes the response of the Engineer to the Contractor's Full and Final Potential Claim Record, or if the Contractor filed a claim and was ordered by the Engineer to submit a change order request to the City's Change Order Committee but the Contractor disputes the decision by the Change

Order Committee then the Contractor shall notify the Engineer of their disagreement and that they intend to file a claim pursuant to Public Contract Code Section 20104.2.

The Contractor's Full and Final Potential Claim Record or submission to the Change Order Committee will not be considered a claim under the Public Contract Code although the Contractor may reference or utilize prior submissions in its Public Contract Code claim. Claims under the Public Contract Code must comply with all Public Contract Code requirements, including being made in writing and include the documents necessary to substantiate the claim by the Contractor.

The claim must be filed on or before the date of the final payment to the Contractor by the City. In instances where a decision by the City Change Order Committee on a change order request is after the final payment to the Contractor, then the Contractor has ten (10) days from the date the Change Order Committee notifies the Contractor of its decision to file the claim under the Public Contract Code or the time period permitted under the California Civil Code to file an effective stop payment notice, whichever is longer. Currently the time period for effective stop payment notice is found in California Civil Code Section 9356.

A. Claims Less Than $50,000

For Claims of less than fifty thousand dollars ($50,000), the City shall respond in writing to any written Claim within 45 days of receipt of the Claim, or may request, in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the claim the City may have against the Contractor.

If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the City and Contractor.

The City's written response to the Claim, as further documented, shall be submitted to the Contractor within 15 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

B. Claims Over $50,000 And Less Than $375,000

For claims over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the City shall respond in writing to all written Claims within 60 days of receipt of the Claim, or may request, in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim the City may have against the Contractor.

If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the City and Contractor.

The City's written response to the Claim, as further documented, shall be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

C. Meet And Confer

If the Contractor disputes the City's written response, or the City fails to respond within the time prescribed, the Contractor may so notify the City, in writing, either within 15 days of receipt of the City's response or within 15 days of the City's failure to respond within the time prescribed,

respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the City shall schedule a meet and confer conference within 30 days for settlement of the dispute. The City Manager, or the City Manager's designee and the Engineer will meet with the Contractor. The conference may take place during regularly scheduled project meetings.

D. Government Code Claims

Following the meet and confer conference, if the Claim or any portion remains in dispute, the Contractor must file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code (a "Government Code Claim"). The process of filing of a Government Code Claim is specifically required in addition to the contractual claims process in these Standard Specifications; such contractual claims process described above does not act as a substitute for the Government Code Claim process, and the two procedures shall be sequential.

Failure to timely file a Government Code Claim shall act as complete waiver by Contractor of the disputed item. The Government Code Claim shall be handled by Contractor and City as required by the Government Code, commencing with Section 900. For purposes of the applicable Government Code provisions, the running of the period of time within which a Government Code Claim must be filed shall be tolled from the time the Contractor submits his or her written Claim pursuant to this Section 4-12 until the time that such Claim is denied as a result of the meet and confer process in Section 4-12.5.C, including any time utilized by such meet and confer process.

4-12.7 Procedures for Claims Over $375,000

Claims over $375,000 shall be handled by Contractor and City in the same manner as Claims of $375,000 or less (see Section 4-12.6, "Procedures for Claims Less Than or Equal to $375,000), except that City shall (a) respond in writing to all written Claims within 90 days of receipt of the Claim, or may request, in writing, within 45 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim the Owner may have against the Contractor, and (b) respond within 45 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

4-12.8 Closeout Meet and Confer

Before the submission of a final payment application, Contractor may request a closeout meet and confer session with the City to discuss any previously submitted Claims that the City did not grant in full. City is under no obligation to meet and confer, but may in its discretion choose to do so. Nothing related to this closeout meet and confer process tolls the running of the period of time for Contractor to present a Government Code Claim pursuant to Sections 4-12.6, "Procedures for Claims Less Than or Equal to $375,000," and 4-12.7, "Procedures for Claims Over $375,000."

4-12.9 Continuing Contract Performance

Despite submission or rejection of a Claim, the Contractor shall proceed diligently with performance of the Contract as directed by City, and the City shall continue to make any undisputed payments in accordance with the Contract.

4-13 Interim Cleanup and Liability for Failure to Provide

During the construction of the project, the Contractor shall provide periodic cleanup as the work progresses, such cleanup to be accomplished as soon as practicable and as public necessity and convenience require, as determined by the Engineer. Contractor is to avoid creating hazards to the public or visual blight. In general, daily interim cleanup will be required. Daily cleanup during construction

shall include, but not be limited to, the removal of all excess soil and other materials or debris from the construction area, and sweeping and cleaning of affected streets.

If the Engineer orders Contractor to provide cleanup work on the jobsite and the Contractor fails to provide the ordered cleanup measures within a reasonable time period as determined by the Engineer, then the Engineer may enforce a penalty of Two Hundred Fifty Dollars ($250.00) for each calendar day that elapses from the time the penalty is ordered until the cleanup measures ordered by the Engineer are completely carried out. Penalty may not exceed One Thousand Dollars ($1,000.00) although City may add cleanup costs incurred by the City. Such penalty shall be deducted in accordance with Section 9-9, "Stop Notices; City's Right To Withhold Payments," from any monies owed the Contractor, or levied as a fine in the case of non-public work. In addition to the penalty specified above, the Engineer may order other forces to provide interim cleanup. The full cost thereof, in addition to the penalty as herein provided, shall be deducted from any monies owed the Contractor or shall be levied as a fine. Alternatively if City Municipal Codes are violated the Contractor may be subject to a code enforcement action and separate penalty under those provisions.

Full compensation for cleanup during construction shall be included in the prices bid for the various items of work; no separate payment will be made therefor.

4-14 Detours

Detours installed or constructed by the Contractor around the work or any portions thereof, whether requested by the Contractor or required by the Plans or the Specifications for use by traffic shall conform to Sections 7-17, "Public Convenience," 7-18, Public Safety," and Section 12, "Traffic Control; Construction Area Traffic Control Devices." Unless otherwise specified in the Contract Specifications, payment for installing and removing detours shall be included in the price bid for Traffic Control, or if there is no bid item, included in the various bid items of work. No additional payment will be made therefor. The Contractor shall be aware that detours which pass through jurisdictions other than the City of Visalia may be subject to special requirements by those jurisdictions. Any costs thereof shall be paid for by the Contractor.

When traffic is routed through the work, provisions for a passageway through construction operations shall also conform to the foregoing Sections, but will not be considered as detour construction or detour maintenance. This work shall conform to and be paid for as provided in Section 7-17, "Public Convenience," unless otherwise specified in the Contract Specifications.

In accordance with Section 8-11, "Temporary Suspension of Work," the failure or refusal of the Contractor to construct and maintain detours at the proper time or route traffic through the works as required shall be sufficient cause for closing down the work until the detours or rerouting are in satisfactory condition for use by traffic.

Any damage caused by the Contractor's operations or by traffic to detours installed solely for the convenience of the Contractor and not required by the Plans, Specifications, or the Engineer, shall be promptly repaired by the Contractor to the satisfaction of the Engineer at the Contractor's expense.

The Contractor must obtain written authorization from the City of Visalia prior to implementing a detour installed for the convenience of the Contractor.

4-15 As-Built Plans

The Contractor shall prepare and submit to the City a complete set of As-Built Plans documenting all changes and deviations from the Project Plans. The As-Built Plans shall be the same size and scale as the

original Plans and all changes or modifications that were made during the course of construction shall be clearly drawn to scale on the plans in red and noted on the plans in red. The As-Built Plans shall note any proposed improvements that were not constructed with the project and any other items that may be deemed necessary by the Engineer. The As-Built Plans shall also show the locations and depths of all the existing utilities located during construction. The As-Built Plans must be submitted to the City and approved by same prior to the request for final payment. Payment for the "As-Built Plans" and all related costs shall be considered as included in the total Contract price paid for the various items of work and no additional compensation provided.

SECTION 5 CONTROL OF WORK

5-1 Authority of the Engineer

The Engineer shall decide all questions which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate or progress of the work, all questions which may arise as to the interpretation of the Plans and Specifications, all questions as to the acceptable fulfillment of the Contract on the part of the Contractor, and all questions as to compensation, including any claims and change orders under Section 4-10, "Changes," Section 4-12, "Notices, Change Orders, and Claims," and Section 9-5, "Payment for Extra Work." The Engineer's decision shall be final and binding upon the Contractor. The Engineer shall also have the authority to enforce and make effective such decisions and orders which the Contractor fails to carry out promptly. In accordance with Section 5-17, "Inspection during Construction; Meetings," the Engineer will delegate authority to representative inspectors to assure compliance with Plans and Specifications.

5-2 Standards

The Engineer shall establish such standards as may be necessary for the proper construction of a finished product. In the absence of specific standards, recognized standards of construction or approved practices shall govern the work.

5-3 Contractor's Responsibility for the Work

Except as specifically provided in these Standard Specifications, until the formal acceptance of the work by the City Council, the Contractor shall have the charge and care thereof and shall bear the risk of injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof, except such injuries or damages occasioned by acts of the Federal Government or the public enemy. The City shall not be held responsible for the care or protection of any material or parts of the work prior to final acceptance, except as expressly provided in the Specifications.

The Contractor shall comply with the requirements of Sections 5-9, "Preservation of Property," and Section 7-16, "Injury or Damage to Persons or Property."

5-4 Contractor's Equipment

The Contractor shall provide adequate and suitable equipment and means of construction to meet all the requirements of the work. When ordered to do so by the Engineer, the Contractor shall remove unsuitable equipment from the work and discontinue the operation of unsatisfactory equipment. The use of any equipment which is obsolete as to type, in bad condition, or worn out will not be permitted on the work.

5-5 Suitable Methods

The Contractor shall use such methods for the performance of the work embraced under these Specifications as will secure a satisfactory quality of work and rate of progress. Such methods shall meet the approval of the Engineer, and shall be submitted for approval before being used on the work. The Engineer reserves the right, during the progress of the work, to make suggestions and revisions in the methods in order that a high quality of work and satisfactory rate of progress may be obtained. When ordered by the Engineer, the Contractor shall discontinue unsuitable methods of work.

5-6 Order of Work

Where required by the Plans or Specifications, the Contractor shall follow the sequence of operations as set forth therein.

Full compensation for conforming to those requirements will be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

5-7 Superintendence and Personnel

The Contractor shall designate in writing before starting work, an authorized representative who shall have the authority to represent and act for the Contractor, to receive suggestions or direction from the Engineer or Inspector and to see them faithfully executed. The Contractor shall provide the name, address, and phone number of each such superintendent or foreman so designated. When the Contractor is comprised of 2 or more persons, firms, partnerships or corporations functioning on a joint venture basis, the Contractor shall designate in writing before starting work, the name of one authorized representative who shall have the authority to represent and act for the Contractor.

The authorized representative shall be present at the site of the work at all times while work is actually in progress on the contract. When work is not in progress and during periods when work is suspended, arrangements acceptable to the Engineer shall be made for any emergency work which may be required.

Whenever the Contractor or the Contractor's authorized representative is not present on any particular part of the work where it may be desired to give direction, orders will be given by the Engineer which shall be received and obeyed by the superintendent or foreman who may have charge of the particular work in reference to which the orders are given. All superintendents, foreman or other personnel responsible for coordinating with City Staff shall be capable of speaking and communicating fluently in English. If no one is available at the site that can communicate with staff, the City shall have the right to suspend the work until an individual able to effectively communicate arrives. All costs due to this suspension of work shall be at the expense of the Contractor.

If any subcontractor, workman, or person employed by the Contractor shall fail or refuse to carry out the directions of the Engineer, or shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, that person shall be removed from the work immediately upon notice by the Engineer and may not be employed again on the work.

All work shall be under general observation and inspection of the Engineer or the Inspector and any work done without the sanction or presence of the Engineer or Inspector will be subject to rejection.

5-8 Emergency Availability

The Contractor shall furnish to the Engineer, prior to the issuance of a "Notice to Proceed," a list of persons (minimum of 2 persons), together with their addresses and 24-hour telephone numbers, who are authorized to act on behalf of the Contractor in an emergency arising out of conditions at the work site after normal working hours. The Contractor shall conform to the requirements in Section 7-18, “Public Safety.”

5-9 Preservation of Property

In accordance with Sections 5-3, “Contractor’s Responsibility For Work,” and 7-16, “Injury or Damage to Persons or Property,” the Contractor shall be liable for any and all damage done to any public or private property, structure, facility or improvement due to his operations. Due care shall be exercised to avoid injury to existing street improvements or facilities, roadside trees and landscaping that are not to be removed, pole lines, fences, signs, survey markers and monuments, buildings and structures, conduits,

pipelines under or above ground, all street facilities, and any other improvements or facilities within or adjacent to the work area, or on private property adjacent to the work area, and all such facilities shall be protected from injury or damage. The Contractor shall provide and install suitable, approved safeguards to protect property or improvements from injury or damage.

If property or improvements are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored to a like new condition in accordance with the Specifications and Contract Documents under this Contract. In certain cases, where the Contractor damages an existing facility such as a curb return and or landing, the Engineer may require the Contractor at his expense to reconstruct the return to meet current Americans with Disabilities Act (ADA) requirements and standards.

The Engineer may make or cause to be made such temporary repairs as are necessary to restore to service any damaged facility. The cost of such repairs shall be borne by the Contractor and may be deducted by the City from any monies due or to become due to the Contractor under the Contract.

5-10 Protection of the Work

The Contractor shall provide and maintain proper barricades, fences, signal lights or watchmen to properly protect the work, persons, animals, and property against injury. The cost of such protection shall be included in the amount bid for the various items of work.

In accordance with Section 7-18, "Public Safety," the Engineer reserves the right to remedy any situation, condition, or neglect on the part of the Contractor as regards the protection of the work, the public, or property and to deduct the cost of such remedy from money due the Contractor, or levy as a fine in the case of non-public work.

5-11 Rights of Way

The City will provide the right of way for the work to be constructed as shown on the Plans. The Contractor shall bring all areas within temporary construction easements to a condition at least equal to that existing prior to their use, to the satisfaction of the Engineer. The Contractor shall not occupy property outside the right-of-way shown on the Plans, except by written agreement with the owner of said property, a copy of which shall be provided the Engineer.

Nothing in these Standard Specifications shall be construed as allowing the Contractor to make any arrangements with any person to permit occupancy or use of any land, structure, or building within the limits of the Contract for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the owner, former owner, or tenant of such land, structure or building.

5-12 Disposal of Material Outside the Right of Way

The Contractor shall make arrangements for the legal disposal of non-hazardous materials outside the right of way and shall pay all costs involved. Disposal of hazardous material shall be handled in accordance with Section 7-14, "Trenches and Excavations; Hazardous Waste." The Contractors shall comply with the applicable diversion and recycling requirements of the City of Visalia Municipal Code for all materials disposed of outside of the right of way.

When any material is to be disposed of outside the right of way, the Contractor shall first obtain a written permit from the property owner on whose property the disposal is to be made and shall file with the Engineer said permit or a certified copy thereof. When material is disposed of as above provided, the Contractor shall conform to all requirements of the City Municipal Code pertaining to grading, hauling and filling of earth, including any permits or bonds so required. Hauling of any materials from the work site shall conform to the provisions in Section 6-12, "Materials Hauling."

The contractor shall clean up and dispose of all excess materials and other debris in any right of way or ground occupied by him and shall restore utilities and improvements on public or private property that has been used or damaged by his operations. Full compensation for all costs involved in disposing of materials as specified in this Section 5-12, including all costs of hauling and any landfill or other fees, shall be considered as included in the price paid for the Contract items of work involving such materials and no additional compensation will be allowed therefor. No additional payment will be granted the Contractor for inconvenience or delays encountered in complying with the requirements of this Section 5-12.

5-13 Electric And Water Service

The Contractor shall provide and pay for electric service for power and lighting required for the construction of the work of the Contract and shall maintain such service until the completion of the Contract.

The Contractor shall make all arrangements for securing any water necessary for the performance of the work. Water will be available from fire hydrants provided a permit and meter are obtained from the California Water Service Company. The Contractor shall be responsible for any fees imposed by the California Water Service Company for the Construction Water.

Water taken from a source other than the California Water Service Company system shall be approved by the Engineer in advance. Such water shall be chemically and biologically suitable for the intended use.

In conformance with the City of Visalia Landscape Standards and Specifications, the water supply for landscape planting and irrigation systems shall be provided by the Contractor in accordance with said document.

All costs for furnishing electric service and water, including water consumed for landscape irrigation and irrigation system testing, shall be included in the various related bid items of work; no additional payment will be made therefor.

5-14 Construction Surveying/Staking

For Non-Public projects the individual, group, or entity constructing the improvements will be responsible for providing the construction surveying/staking, and will be responsible for all costs associated therewith.

Unless otherwise specified in the Special Provisions, construction surveying and staking shall be provided by the City Surveying crew for City of Visalia Public projects.

Surveying and staking shall be conducted only by, or under the immediate supervision of, a person licensed by the State of California to practice Land Surveying. Surveying shall conform to the quality and practice required by the Engineer.

Where the City provides construction staking the exact locations of construction work will be indicated by the City of Visalia with location stakes when necessary. The Contractor shall not commence any construction without such stakes in place. The Contractor shall pay for all re-staking required should any stakes be lost or damaged. **The Contractor shall make all requests for construction staking in writing to the City of Visalia, a minimum of seventy-two (72) hours, not including weekends and holidays, in advance of the requested staking needed.**

The Contractor shall immediately inform the Engineer in writing of any discrepancies discovered during the course of the work between the Plans and the construction staking, and the Engineer shall promptly verify the same. Any work done after such discovery, until authorized, will be done at the Contractor's risk.

Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. Any deviation of constructed facilities from the grades shown on the Plans and staked in the field shall be the responsibility of the Contractor.

Grades for underground conduits will be set at the surface of the ground and the Contractor shall be responsible for transferring such grades to the bottom of the trench.

The Contractor shall preserve property line markers, corner survey markers, and benchmarks except where their destruction is unavoidable when the Contractor is proceeding in accordance with accepted practice. The Contractor shall contact the City Surveyor, Jeff Land, at (559) 713-4630, 72 hours, not including weekends and holidays, prior to disturbing any survey markers/benchmarks. Markers that are lost or disturbed by Contractor's operations shall be replaced at the Contractor's expense by a person appropriately licensed by the State of California for Land Surveying. Corner records for replaced monuments shall be filed with the County Surveyor prior to the final payment being made and/or the Notice of Completion being issued. All work to restore lost or disturbed markers shall be at the expense of the Contractor. The Contractor shall comply with the provisions in Section 37-2, "Survey Monuments."

The costs for replacing any survey markers/monuments damaged or removed during construction shall be included in the amount bid for the various items of work; no separate payment will be made therefor.

5-15 Cooperation

The Contractor shall cooperate in all respects with all public and private agencies, including, but not limited to, Irrigation Districts, Caltrans, Railroads, Schools & School Districts, California Water Service Co., Cable TV and Telephone Companies, Southern California Edison Co., the Visalia City Storm, Sewer, Parks, Solid Waste, Streets, Transit and Traffic Divisions and the respective Fire and Police Departments

The Contractor shall comply with the provisions in Section 8-15, "Utility and Non-Street Facilities; Potholing." Should construction be under way by other forces or by other contractors within or adjacent to the limits of the work specified or should work of any other nature be under way by other forces within or adjacent to those limits, the Contractor shall cooperate with all the other contractors or other forces to the end that any delay or hindrance to their work will be avoided. The right is reserved to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

When 2 or more contractors are employed on related or adjacent work, or obtaining materials from the same material source, each shall conduct their operations in such a manner as not to cause any unnecessary delay or hindrance to the other. Each contractor shall be responsible to the other for all damage to work, to persons or property caused to the other by their operations, and for loss caused the other due to unnecessary delays or failure to finish the work within the time specified for completion.

5-16 Maintaining Drainage

The Contractor shall provide and maintain drainage to the area of work. Temporary provisions for drainage of any area during construction where existing drainage facilities have been damaged or altered

or where normal drainage patterns of adjacent areas will be interrupted by the Contractor during his operations, shall be made by the Contractor and as directed by the Engineer.

The Contractor shall be responsible for diverting drainage around all proposed improvements during construction until the proposed improvements are accepted by the City. Any damage or additional costs incurred due to the failure of the Contractor to provide adequate drainage/divert drainage shall be repaired and paid for by the Contractor.

The Contractor shall be responsible for all damages to public or private property upstream or downstream of the work incurred due to failure to provide adequate drainage within and through the construction area or due to blockage of existing drainage facilities or pathways at or upstream from the area of work, or for re-routing flows to areas not historically receiving such drainage.

In the performance of Maintaining Drainage, the Contractor shall comply in all respects with Section 7-7, "Water Pollution Prevention."

The costs for Maintaining Drainage by the Contractor shall be included in the amount bid for the various items of work; no separate payment will be made therefor.

5-17 Inspection During Construction; Meetings

As provided in Section 5-1, "Authority of the Engineer," the Engineer will delegate authority to a representative Inspector who shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge relative to the progress, workmanship, and character of materials used and employed in the work. Prior to construction the Contractor shall be responsible for verifying all items that require inspection, sampling, and testing with the City Inspector. The Contractor shall be responsible for providing construction personal to assist the Inspector with completing inspection activities when requested. The Contractor shall provide facilities necessary to ensure the safety of the Engineer, City inspectors, and the personnel of authorized testing laboratories as appropriate. The City and its agents, employees, inspectors and testing laboratories may videotape, audiotape, or photograph any aspect of the Work or Contractor's activities as part of their documentation of the project and certain issues.

Whenever the Contractor varies the day, or period of the day, during which work is performed, he shall give due notice to the Engineer or Inspector so that proper inspection may be provided. Any work done in the absence of the Engineer or Inspector is subject to rejection.

For non-public work conducted under a City Permit, contact the City of Visalia Community Development Department regarding inspection fees and re-inspection fees. Such fees shall be applied in accordance with the fee schedule in effect at the time of permit issuance.

The inspection, approval and/or acceptance of the work shall not relieve the Contractor of any obligations to fulfill the Contract as prescribed. Defective work shall be made good and unsuitable materials may be rejected, even if unsuitable materials may have been previously overlooked by the Engineer or Inspector and accepted, or estimated for payment.

Projects financed in whole or in part with funds from sources other than the City shall be subject to inspection at all times by the agency providing said funds or its authorized agent.

Should a situation occur where an inspector is required to remain on site to inspect construction activities after normal working hours, the Contractor will be charged the full City hourly overtime rate for the

inspector. Should a Contractor request to work hours outside of normal working hours and should this request be granted the Contractor will be charged the full City hourly overtime rate for the inspector unless approved otherwise by the Engineer in writing. These charges will be deducted from the price paid to the Contractor in the case of a Public project. These charges will be levied as a fine in the case of a Non-Public project.

The Contractor shall coordinate with the City's Public Works Inspector during all phases of construction. The Inspector shall be notified a **minimum of forty-eight (48) hours in advance** to when an inspection is needed not including weekends and holidays.

When specified in the Special Provisions, the Contractor shall be required to attend meetings with the City at the frequency noted to review the construction progress and all construction issues. At the Engineer's option, the City may prepare minutes for each meeting and forward them to Contractor; Contractor's failure to correct the minutes within two (2) working days shall be deemed agreement with the content of the minutes. Either party has the right to audiotape or videotape the meeting.

5-18 Differing Site Conditions

During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering those conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed. If you fail to promptly notify the Engineer, you waive the differing site condition claim for the period between your discovery of the differing site condition and your notification to the Engineer. If you disturb the site after discovery and before the Engineer's investigation, you waive the differing site condition claim.

Upon written notification from the Contractor, the Engineer will investigate the conditions, and if the Engineer determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made and the contract modified in writing accordingly. The Engineer will notify the Contractor of the Engineer's determination whether or not an adjustment of the contract is warranted. No contract adjustment which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.

No contract adjustment will be allowed under the provisions specified in this section for any effects caused on unchanged work.

Any contract adjustment warranted due to differing site conditions will be made in conformance with the provisions in Section 4-10, "Changes," and Section 4-12, "Notices, Change Orders, and Claims."

5-19 Removal of Defective or Unauthorized Work

All work which is defective in its construction or deficient in any of the requirements of the contract documents shall be remedied or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed for such correction.

Whenever the Contractor varies the period during which the work is carried out each day, he shall give due notice to the Engineer, or Inspector, so that proper inspection may be provided. Any work done in the absence of the Engineer or Inspector will be subject to rejection and no compensation will be allowed therefor.

Any work done beyond the lines and grades shown on the Plans or established by the Engineer or any extra work done without written authority will be considered as unauthorized and will not be paid for.

5-20 Surface Restoration

The Contractor shall replace all graded surface material adjacent and/or appurtenant to the work removed, disturbed, or damaged by the Contractor's operations, and shall restore paving, curbing, sidewalks, gutters, landscaping, fences, lawn and other surfaces disturbed, to a like new condition in accordance with the Specifications or Plans, and shall furnish all labor and material incidental thereto. Where bid items are not provided for each type of restoration, full compensation therefor shall be included in the amount bid for the various items of Contract work. The Contractor shall comply with the provisions Section 19-3.5, "Restoration of Surfaces."

5-21 Final Cleanup

When construction is substantially complete, and prior to application for acceptance of the work, the Contractor shall clean all work areas and all grounds occupied by him in connection with the work of all debris, excess materials, temporary structures and equipment. All portions of the work shall be left in a neat, presentable condition. The roadways in which construction operations have been accomplished, as well as all haul roads upon which spillage has occurred, shall be swept clean, as directed by the Engineer. Roads adjacent to construction activity which have received dirt or debris tracked from the construction area shall also be swept and cleaned. Upon completion of Final Cleanup, the Contractor shall notify the Engineer in writing that the work is substantially complete in all parts and requirements and ready for final inspection as provided in Section 5-22, "Final Inspection."

If the Contractor fails to provide Final Cleanup to the satisfaction of the Engineer, a final inspection will not be performed by the Engineer until such cleanup is provided. If the contract time is exceeded due to the Contractor's failure to provide, or is late in providing, the required final cleanup, the provisions of Section 8-9, "Liquidated Damages," will be applied.

All costs for providing Final Cleanup shall be included in the various bid items of work; no additional payment will be made therefor.

5-22 Final Inspection

Whenever the Work provided and contemplated by the Contract is substantially complete, and all requirements have been met, and the final cleanup performed in accordance with Section 5-21, "Final Cleanup," the Contractor shall request in writing a final inspection be made by the Engineer. The written request shall include a statement that the Work has been completed in all parts and requirements of the Contract. For projects involving landscaping and irrigation systems, the maintenance period provisions listed in the City of Visalia Landscape Standards and Specifications apply.

The Engineer will determine the adequacy of the final cleanup, and if found not to be in compliance with said Section 5-21, will not make the final inspection and instead direct the Contractor to perform additional cleanup as required until compliance is reached.

Upon making a determination that the final cleanup is in compliance with said Section 5-21, the Engineer will conduct a final inspection. Representatives from various City Departments as well as other agencies who will own, operate, and maintain the improvements constructed by the Contractor will participate in the final inspection. The inspection should be completed within fifteen (15) working days. The time required by the Engineer and others to conduct the final inspection will not be counted against the allotted time for completion of the contract.

Upon completion of the final inspection, a list of items needing correction to comply with the contract documents, if any, will be provided by the Inspector or Engineer to the contractor. The time required to make such corrections will be charged against the allotted time for completion of the Contract. The Contractor shall notify the Inspector when the corrections have been completed and are ready for inspeciton.

Failure to complete the work in all parts and requirements of the contract including providing Final Cleanup in a timely manner to allow sufficient time to accomplish corrective work, any of which results in an overrun in contract time, the provisions of Section 8-9, "Liquidated Damages," will be applied.

5-23 Guarantee of Workmanship

In conformance with Sections 3-5, "Materials Statement, Samples and Guarantees," 6-10, "Guarantee of Materials," and 7-23, "Guarantee," the Contractor shall guarantee all materials, equipment and workmanship of the installation and Work for a period of one year from the recordation date listed on the recorded Notice of Completion approved by the City Council. Additional longer guarantees may be required by the Specifications. Should any material or appliance or any work develop any defect or weakness due, in the opinion of the Engineer, to the use of imperfect materials, equipment or workmanship, or failure to follow the Contract, including the Plans and Specifications, the Contractor shall be notified within the time period of the Guarantee, and shall immediately perform, at Contractor's expense, the necessary repairs or replacements to make the defective item or items suitable and satisfactory. Expiration of the Guarantee time period shall not void an obligation of the Contractor which is based on a timely notice by the City. Should exigencies necessitate the repairs before the Contractor could be notified, or should the Contractor refuse to make the repairs or replacements within a reasonable period of time, the Engineer shall have the right to make the necessary repairs or replacements at the expense of the Contractor, preserving as far as possible all available evidence of the cause of failure.

This guarantee provision applies to all work performed in City right of way or property, whether by contract with the City or work performed under Encroachment Permit by or for utility or communications companies or other private entities. For work done under Encroachment Permit, failure to correct or pay for defective workmanship or materials may result in denial of future permits to perform work in City rights of way or property.

All costs for providing the required Guarantees of Workmanship shall be included in the various bid items; no additional payment will be made therefor.

5-24 Cost Reduction Incentive

The Contractor may submit to the Engineer, in writing, proposals for modifying the Plans, Specifications, or other requirements of the contract for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair, in any manner, the essential functions or characteristics of the project, including but not limited to service life, economy of operation, ease of maintenance, desired appearance, or design and safety standards.

Cost reduction proposals shall contain the following information:

A. A description of both the existing Contract requirements for performing the work and the proposed changes.

B. An itemization of the contract requirements that must be changed if the proposal is adopted.

C. A detailed estimate of the cost of performing the work under the existing contract and under the proposed change. The estimates of cost shall be determined in the same manner as if the work were to be paid for on a force account basis as provided in Section 9-1.04, "Force Account," of the State Standard Specifications.

D. A statement of the time within which the Engineer must make a decision thereon.

E. The contract items of work affected by the proposed changes, including any quantity variation attributable thereto.

The provisions of this Section 5-24 shall not be construed to require the Engineer to consider any cost reduction proposal which may be submitted hereunder; proposed changes in basic design of a bridge or of a pavement type will not be considered as an acceptable cost reduction proposal; and the City will not be liable to the Contractor for failure to accept or act upon any cost reduction proposal submitted pursuant to this section nor for any delays to the work attributable to any cost reduction proposal. If a cost reduction proposal is similar to a change in the Plans or Specifications under consideration by the City for the project at the time the proposal is submitted, or if the proposal is based upon or similar to these Specifications, the Contract Documents or Standard Drawings adopted by the City after the advertisement for the contract, the Engineer will not accept the proposal, and the City reserves the right to make the changes without compensation to the Contractor under the provisions of this section.

The Contractor shall continue to perform the work in accordance with the requirements of the contract until an executed change order, incorporating the cost reduction proposal has been issued. If an executed change order has not been issued by the date upon which the Contractor's cost reduction proposal specifies that a decision thereon should be made, or such other date as the Contractor may subsequently have specified in writing, the cost reduction proposal shall be deemed rejected.

The Engineer shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in construction costs from the adoption of all or any part of the proposal. In determining the estimated net savings, the right is reserved to disregard the contract bid prices if in the judgment of the Engineer, those prices do not represent a fair measure of the value of work to be performed or to be deleted.

The City reserves the right where it deems such action appropriate, to require the Contractor to share in the City's costs of investigating a cost reduction proposal submitted by the Contractor as a condition of considering the proposal. Where this condition is imposed, the Contractor shall indicate acceptance thereof in writing, and that acceptance shall constitute full authority for the City to deduct amounts payable to the City from any moneys due or that may become due to the Contractor under the contract.

If the Contractor's cost reduction proposal is accepted in whole or in part the acceptance will be by a contract change order, which shall specifically state that it is executed pursuant to this Section 5-24. The change order shall incorporate the changes in the plans and specifications which are necessary to permit the cost reduction proposal or that part of it as has been accepted to be put into effect, and shall include any conditions upon which the City's approval thereof is based if the approval of the City is conditional. The change order shall also set forth the estimated net savings in construction costs attributable to the cost reduction proposal effectuated by the change order, and shall further provide that the Contractor be paid 50 percent of that estimated net savings amount. The Contractor's cost of preparing the cost reduction incentive proposal and the City's costs of investigating a cost reduction incentive proposal, including any portion thereof paid by the Contractor, shall be included in consideration in determining the estimated net savings in construction costs.

Acceptance of the cost reduction proposal and performance of the work thereunder shall not extend the time of completion of the Contract unless specifically provided for in the contract change order authorizing the use of the cost reduction proposal. The amount specified to be paid to the Contractor in the change order which effectuates a cost reduction proposal shall constitute full compensation to the Contractor for the cost reduction proposal and the performance of the work thereof pursuant to the change order.

The City expressly reserves the right to adopt a cost reduction proposal for general use on contracts administered by the City when it determines that the proposal is suitable for application to other contracts. When an accepted cost reduction proposal is adopted for general use, only the Contractor who first submitted that proposal will be eligible for compensation pursuant to this section, and in that case, only as to those contracts awarded to that Contractor prior to submission of the accepted cost reduction proposal and as to which the cost reduction proposal is also submitted and accepted. Cost reduction proposals identical or similar to previously submitted proposals will be eligible for consideration and compensation under the provisions of this Section 5-24 if the identical or similar previously submitted proposals were not adopted for general application to other contracts administered by the City. Subject to the provisions contained herein, the City shall have the right to use all or any part of any submitted cost reduction proposal without obligation or compensation of any kind to the Contractor.

5-25 Character of Workers

If any subcontractor or person employed by the Contractor shall fail or refuse to carry out the directions of the Engineer or shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the requisition of the Engineer, and such person shall not again be employed on the Work.

SECTION 6 CONTROL OF MATERIALS

6-1 Source of Supply and Quality of Materials

The Contractor shall furnish all materials required to complete the work. Only materials conforming to the requirements of the plans and specifications shall be incorporated in the work. The materials furnished and used shall be new, except as may be provided elsewhere in these specifications, on the plans or in the special provisions. The materials shall be manufactured, handled and used in a workmanlike manner to ensure completed work in accordance with the plans and specifications. Materials to be used in the work will be subject to inspection and tests by the Engineer or the Engineer's designated representative. The Contractor shall furnish without charge such samples as may be required.

The Contractor shall furnish the Engineer a list of the Contractor's sources of materials and the locations at which those materials will be available for inspection. The list shall be furnished to the Engineer in sufficient time to permit inspecting and testing of materials to be furnished from the listed sources in advance of their use. The Engineer may inspect, sample or test materials at the source of supply or other locations, but the inspection, sampling or testing will not be undertaken until the Engineer is assured by the Contractor of the cooperation and assistance of both the Contractor and the supplier of the material. The Contractor shall assure that the Engineer or the Engineer's authorized representative has free access at all times to the material to be inspected, sampled or tested.

It is understood that the inspections and tests if made at any point other than the point of incorporation in the work in no way shall be considered as a guaranty of acceptance of the material nor of continued acceptance of material presumed to be similar to that upon which inspections and tests have been made, and that inspection and testing performed by the Engineer shall not relieve the Contractor or the Contractor's suppliers of responsibility for quality control.

Manufacturers' warranties, guaranties, instruction sheets and parts lists which are furnished with certain articles or materials incorporated in the work, shall be delivered to the Engineer before acceptance of the contract. Reports and records of inspections made and tests performed, when available at the site of the work, may be examined by the Contractor.

6-2 Storage and Protection of Materials

The Contractor shall provide and maintain storage facilities and employ such measures as will preserve the specified quality and fitness of materials to be used in the work. Stored materials shall be reasonably accessible for inspection. The Contractor shall also adequately protect new and existing work and all items of equipment for the duration of the Contract.

The Contractor shall provide adequate equipment and means for construction of the work. The Contractor shall remove such equipment and/or materials when in the opinion of the City, the equipment is unsuitable for performing the work or unsatisfactory, including equipment which is obsolete, in bad repair or worn out.

If the Contractor is storing equipment and materials on private property, the Contractor shall submit to the City a letter of permission signed by the owner of the private property allowing the Contractor to use the private property. Owner authorization is required prior to use of private property.

The Contractor shall provide his own area of storage for equipment and materials used on the project. Such equipment and/or materials shall be stored off the roadway. Equipment and materials shall not be stored within any street right of way unless specifically approved by the Engineer in writing. The storage of said equipment or materials shall be at the exclusive risk of the Contractor and he shall pay all costs for

any loss or damages resulting from the storage. Security fencing or security guards, if required by the Contractor, shall be provided at his own expense. Upon completion of the project the Contractor shall restore the areas used for storage to their original condition.

During construction hot mix asphalt and cold mix asphalt materials shall not be dumped or piled on any existing street improvements in the right of way that are not being removed/replaced. All rubble and other materials shall be cleaned up and removed from the street right of way at the end of each day. When materials and equipment are being temporarily stored in the right of way during the work day the Contractor shall be responsible for parking/placing equipment and materials along the roadway in a manner that provides safe passage for the public.

Full Compensation for conforming to the requirements of this Section shall be considered as being included in the total Contract price and no additional compensation shall be made therefore.

6-3 Defective Material

All materials not conforming to the requirements of the Plans and Specifications shall be considered as defective, and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the site of the work at the Contractor's expense unless otherwise permitted by the Engineer. No rejected material, the defects of which have subsequently been corrected, shall be used until approved by the Engineer.

Upon failure on the part of the Contractor to comply with any order of the Engineer made under the provisions of this article, the Engineer shall have authority to remove and replace defective material, and to deduct the cost of removal and replacement from any monies due or to become due to the Contractor.

6-4 Trade Names or Equal

Whenever the material or article to be furnished is described by trade name, brand name, or other reference is made to specific manufacturer or supplier, "or approved equal," or "City approved equal," it shall be understood that the use of a trade name or brand name is intended to describe a specific quality of material to be used in the project. The City's intention shall not be interpreted to exclude or omit the products of any responsible manufacturer if such products are equal or superior in every respect to those specifically described.

No substitutions shall be used in the work without prior approval of the Engineer. The burden of proof as to the quality and suitability of alternatives shall be upon the Contractor, and the Contractor shall furnish all information necessary as required by the Engineer. The Engineer shall be the sole judge as to the quality and suitability of alternative articles or materials, and the Engineer's decision shall be final.

Upon submittal by the Contractor, the Engineer will determine the acceptability of the requested substitution, which may include such samples and tests as may be required by Section 6-8, "Samples and Tests," herein. In such cases of proving equal status, the Contractor shall pay the costs of required testing. No time extension to any Contract will be allowed due to any such proposed substitution, or the time required to determine the acceptability of such substitutions.

6-5 Certificates of Compliance

A Certificate of Compliance stating that the materials to be used in the work comply in all respects with the requirements of the Plans and Specifications shall be supplied to the Engineer upon request, or if required to be submitted by the Contract Documents. The certificate shall be signed by the manufacturer of the material or the manufacturer of assembled material delivered to the work, and the lot so certified

must be clearly identified in the certificate. Certificates of Compliance shall be provided in triplicate and shall be submitted to the Engineer for review prior to the use of the product or material in the work.

All materials used on the basis of a Certificate of Compliance may be tested and sampled at any time. The fact that material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the work which conforms to the requirements of the Plans and Specifications, and any such material not conforming to such requirements will be subject to rejection whether in place or not.

The form of the Certificate of Compliance and its disposition shall be as directed by the Engineer. No additional payment will be made for furnishing certificates and all costs incurred shall be included in the various bid items; no additional payment will be made therefor.

6-6 Foreign Materials

The Contractor shall not be entitled to an extension of time for acts or events occurring outside of the United States, and it shall be the Contractor's responsibility to deliver materials obtained from outside of the United States to the point of entry into the continental United States in sufficient time to permit timely delivery to the job site. The provisions in Section 8-9, "Liquidated Damages," will apply.

The manufacturer, producer, supplier, or fabricator of foreign material shall furnish to the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-5 "Certificates of Compliance." In addition, certified mill test reports clearly identifiable to the lot of material shall be furnished where required in these specifications, the Contract Documents, or otherwise requested by the Engineer. The Contractor is directed to the State & Federal Funding Requirements section of these Construction Specifications to determine if the project is subject to the "Buy America" requirements. Where the "Buy America" provisions apply, they supersede any specifications listed in this section.

6-7 Local Materials

Local material is rock, sand, gravel, earth or other mineral material, other than local borrow or selected material, obtained or produced from sources in the vicinity of the work specifically for use on the project. Local material does not include materials obtained from established commercial sources. Local materials shall be furnished by the Contractor from any source the Contractor may elect, except that when mandatory local material sources of certain materials are designated in the special provisions, the Contractor shall furnish material from those designated mandatory sources.

The Contractor shall make all arrangements necessary to obtain materials from any local material source other than a mandatory local material source. If the Contractor elects to obtain material from any other non-mandatory source, the Contractor shall furnish the Engineer with satisfactory evidence that the Contractor has entered into an agreement with the property owner for obtaining material from that source and with copies of any necessary permits, licenses and environmental clearances before removing any material from those sources.

The furnishing of local materials from any source is subject to the provisions of Section 2-2, "Examination of Site of Work, Plans, Specifications and Contract Documents." Unless described in the Contract Documents as a mandatory local material source, or approved in writing by the Engineer, material sources shall not be excavated at locations where the resulting scars will present an unsightly appearance from any street or highway. No payment will be made for material obtained in violation of this provision.

The Contractor shall, at the Contractor's expense, make any arrangements necessary for hauling over local public and private roads from any source. Local materials will be subject to the provisions of Section 6-8, “Samples and Tests.”

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in conforming to the provisions in this Section 6-7, for furnishing and producing materials from any source shall be considered as included in the price paid for the contract item of work involving the material and no additional compensation will be allowed therefor.

6-8 Samples and Tests

For Non-Public projects the permittee, individual, group, or entity constructing the improvements will be responsible for retaining a Certified Testing Laboratory to complete all sampling, materials tests, and compaction testing required by the City of Visalia. Testing reports shall be submitted to the City for acceptance of all improvements. Reports shall be formatted in a manner that defines the limits of testing, materials tested, and passing or failing results in a manner that is deemed satisfactory by the City. This said individual, group, or entity will be responsible for all costs associated with retaining said testing laboratory and all costs to complete the required testing.

For City of Visalia Public projects payment for testing services will be made in accordance with the remainder of Section 6-8 and Section 6-9.

All sampling and testing shall be done in the presence of the Inspector.

In accordance with Section 6-1, “Source of Supply and Quality of Materials,” at the option of the Engineer, the source of supply of each of the materials shall be approved by the Engineer before delivery is started and before such material is used in the work. Representative preliminary samples of the character and quality prescribed shall be submitted by the Contractor or producer of all materials to be used in the work, for testing or examination as desired by the Engineer. The Contractor shall furnish and deliver such samples of materials as are requested by the Engineer, without charge. No material requiring source testing shall be used until it has been approved by the Engineer. Samples will be secured and tested whenever necessary to determine the quality of materials.

Whenever a reference is made in these Standard Specifications to a specification, manual or test designation either of the ASTM, the AASHTO, Federal Specifications, or any other recognized national organization, and the number or other identification representing the year of adoption or latest revision is omitted, it shall mean the specification, manual or test designation in effect on the day the Notice to Contractors for the work is dated.

Whenever the specification, manual or test designation provides for test reports (such as certified mill test reports) from the manufacturer, copies of those reports, identified as to the lot of material, shall be furnished to the Engineer by the Contractor. The manufacturer's test reports shall supplement the inspection, sampling and testing provisions in this Section 6, and shall not constitute a waiver of the City's right to inspect. When material which cannot be identified with specific test reports is proposed for use, the Engineer may, at the Engineer's discretion, select random samples from the lot for testing. Test specimens from the random samples, including those required for retest, shall be prepared in accordance with the referenced specification and furnished by the Contractor at the Contractor's expense. The number of the samples and test specimens shall be entirely at the discretion of the Engineer. Unidentified metal products, such as sheet, plate and hardware shall be subject to the requirements of Section 55-1.02A(6), "Unidentified Stock Material,” of the State Standard Specifications.

When requested by the Engineer, the Contractor shall furnish, without charge, samples of all materials entering into the work, and no material shall be used prior to approval by the Engineer, except as provided in Section 6-5, "Certificates of Compliance." Samples of material from local sources shall be taken by or in the presence of the Engineer or Inspector; otherwise, the samples will not be considered for testing.

All tests of materials furnished by the Contractor shall be made in accordance with the commonly recognized standards of national organizations, and such special methods and tests as prescribed in these Specifications.

Whenever the specifications require compliance with specified values for the following properties, tests will be made by the American Society for Testing and Materials (ASTM) test or California Test (CT) indicated unless otherwise specified:

ASTM Test or California Test	**Properties**
Soils and Aggregates	
ASTM D1557	Relative Compaction
ASTM C136 or CT 202	Grading (Sieve Analysis)
ASTM C117	Wash Analysis finer than #200 Sieve
ASTM D2419 or CT 217	Soil Sand Equivalent
CT 301	"R" Value Determination
ASTM D3744 or CT 229E	Durability Index of Aggregate
ASTM D6938	In-Place Density & Moisture Content by Nuclear Gauge
Hot Mix Asphalt	
ASTM D2172, D6307 or CT 382	Bitumen Content
ASTM D5444	Gradation of Extracted Sample
CT 309	Maximum Theoretical Density (Rice Method)
CT 366	Stability Value
CT 367	Air Void Content
CT 370	Moisture Content
ASTM D2950 & CT 375	In Place Density and Relative Compaction by Nuclear Gauge

The City reserves the right to perform or have the Contractor perform any additional tests the City requires to verify that all materials and improvements meet the requirements of the Contract Documents. Concrete testing may also be performed including but not limited to slump tests, strength testing or any other material testing required. Any materials or improvements that fail to meet Contract requirements shall be removed and replaced at the expense of the Contractor.

Unless provided otherwise in the Specifications, the cost of original testing shall be borne by the City for work performed under Contract for the City. Any retesting required because of failure of materials to pass the initial test shall be done at the expense of the Contractor. All other tests required for work not under contract with the City, and located in City streets and alleys, or on private property, shall be borne by the Contractor, or permittee in the case of non-public work performed under a City Encroachment Permit.

6-9 Compaction Tests

Relative compaction of soil in roadways, trenches, structural backfills, embankments, and for any other improvement shall be determined by the laboratory standard of test procedure ASTM D1557. To be

considered a "passing" test, all compaction tests must meet the required relative percent compaction and must indicate a moisture content within 2% ± of optimum. The Nuclear Gauge Method (ASTM D6938), Drive-Cylinder method (ASTM D2937), the Sand Cone Method (ASTM D1556), or other methods approved by the Engineer may be used for sampling of compacted soil. The Contractor's responsibility for costs associated with testing shall be in accordance with the provisions of Section 6-8, "Samples and Tests."

The City requires haunch compaction testing in trenches where pipes with an inner diameter of 24 inches or larger are being installed. The Contractor is responsible for planning construction means and methods appropriately and for providing safe access to City and testing staff to perform the required compaction testing in the pipe haunch and trench areas.

Density of Hot Mix Asphalt shall be as required in Section 28 "Hot Mix Asphalt".

The contractor shall give **notice to the Inspector a minimum of two (2) working days not including weekends and holidays** in advance of when the required compaction tests are to be taken. For Public projects, normally, the first series of tests will be taken at the expense of the City. Any further tests needed to check re-compacted areas because of a failure to pass the original test shall be at the expense of the Contractor. The Engineer or Inspector shall specify the locations where compaction tests are to be taken.

6-10 Guarantee of Materials

The Contractor shall comply with the provisions in Sections 3-5, "Materials Statement, Samples and Guarantees," 5-23, "Guarantee of Workmanship," and 7-23, "Guarantee." The Contractor shall guarantee all materials, including landscape plantings and irrigation systems, equipment, and workmanship of the installation for a period of one year from the recordation date listed on the recorded Notice of Completion accepted by the City Council. Additional guarantees may be required by the Contract Documents. Should any material or appliance or any work develop any defect or weakness due, in the opinion of the Engineer, to the use of imperfect materials, equipment or workmanship, or failure to follow the Contract, including the Plans and Specifications, the Contractor shall be notified within the time period of the Guarantee, and shall immediately perform, at Contractor's expense, the necessary repairs or replacements to make the defective item or items suitable and satisfactory. Expiration of the Guarantee time period shall not void an obligation of the Contractor to repair or replace which is based on a timely notice by the City. Should exigencies be such as to necessitate the repairs before the Contractor could be notified, or should the Contractor refuse to make the repairs or replacements within a reasonable period of time, the City shall have the right to make the necessary repairs or replacements at the expense of the Contractor, preserving as far as possible all available evidence of the cause of failure.

All costs for providing guarantees shall be included in the various bid items; no additional payment will be made therefor.

6-11 Salvage of Materials

Where salvage of material is indicated on the Plans or in the Contract Documents, salvaged material shall remain the property of the City and shall be delivered and deposited by the Contractor at the location specified in the Plans, Contract Documents, or by the Engineer. No separate payment will be made for such salvaging and delivering of material; the cost thereof shall be included in the various bid items of work.

6-12 Materials Hauling

Hauling of all materials to, from, or on, the jobsite shall be performed in strict accordance with the California Vehicle Code (CVC) Section 23114 as it relates to covering, spillage, and other requirements. All references to "highway" in the CVC shall mean City streets as well as State highways.

6-13 Material Submittal Package

Four (4) unbound copies of the materials submittal package for the project shall be delivered to the Engineer for acceptance at the preconstruction meeting. The material submittal package shall include a table of contents, manufacturer's submittal data sheets, statements that the products meet the requirements of the Specifications for the project, MSDS safety sheets, and any other items requested by the Engineer to verify compliance with the Contract Documents. The materials submittal package shall be accepted by the Engineer prior to construction.

SECTION 7 LEGAL RELATIONS AND RESPONSIBILITY

7-1 Laws to be Observed

The Contractor shall be and remain fully informed of all existing and future State and Federal laws, City and County ordinances and regulations, and revisions thereto that in any way affect those engaged or employed in or on the work or in any way affect the conduct of the work, and of all orders or decrees of governmental or other bodies or officials having jurisdiction or authority over the same. The Contractor, and all subcontractors, persons, firms or corporations employed by or under the control of the Contractor, shall at all times observe and comply with all such laws, ordinances and regulations, orders and decrees. The Contractor shall protect and indemnify the City and its officers, employees and agents, against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree whether by the Contractor, the Contractor's employees, subcontractors, persons, firms or corporations employed by the Contractor. If any discrepancy or inconsistency is discovered in the Plans or Specifications for the work in relation to any such law, ordinance, regulation, order or decree, the Contractor shall forthwith report the same to the Engineer in writing.

7-2 Labor Code Requirements

The following requirements of the State Labor Code apply to all City Contracts:

7-2.1 Hours of Labor

Eight hours labor constitutes a legal day's work. The Contractor or any subcontractor under the Contractor shall forfeit, as a penalty to the State of California, twenty five dollars ($25) or such other amount as may be amended by the Department of Industrial Relations from time to time for each worker employed in the execution of the contract by the respective Contractor or subcontractor for each calendar day during which that worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the requirements of the Labor Code, and in particular, Section 1810 to Section 1815, thereof, inclusive, except that work performed by employees of Contractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one half times the basic rate of pay, as provided in Section 1815 thereof.

7-2.2 Prevailing Wage

For projects that are fully funded with local monies, the City of Visalia may waive the requirement for Prevailing Wages pursuant to Resolution 83-02, adopted by the City of Visalia City Council on January 3, 1983. See the Notice to Contractors and the Special Provisions to determine if a prevailing wage rate is established for this project. When a project requires prevailing wage rates, the following requirements listed in this Section 7-2.2 shall dictate.

The Contractor and any subcontractor under the Contractor shall comply with Labor Code Sections 1774 and 1775. Pursuant to Section 1775, the Contractor and any subcontractor under the Contractor shall forfeit to the State or political subdivision on whose behalf a contract is awarded a penalty of not more than fifty dollars ($50), or such other amount as may be amended from time to time by the Department of Industrial Relations for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of Industrial Relations for the work or craft in which the worker is employed for any public (City) work done under the contract by the Contractor or by any subcontractor under the Contractor in violation of the requirements of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. The amount of this forfeiture shall be determined by the Labor Commissioner and shall be based on consideration of the mistake, inadvertence, or neglect of the Contractor or subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or subcontractor in meeting their respective prevailing wage obligations, or the willful

failure by the Contractor or subcontractor to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor or subcontractor had knowledge of the obligations under the Labor Code. In addition to the penalty and pursuant to Labor Code Section 1775, the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor or subcontractor. If a worker employed by a subcontractor on a public works (City) project is not paid the general prevailing per diem wages by the subcontractor, the prime contractor of the project is not liable for the penalties described above unless the prime contractor had knowledge of that failure of the subcontractor to pay the specified prevailing rate of wages to those workers or unless the prime contractor fails to comply with all of the following requirements:

A. The contract executed between the contractor and the subcontractor for the performance of work on the public works (City) project shall include a copy of the requirements in Sections 1771, 1775, 1776, 1777.5, 1813 and 1815 of the Labor Code.

B. The contractor shall monitor the payment of the specified general prevailing rate of per diem wages by the subcontractor to the employees, by periodic review of the certified payroll records of the subcontractor.

C. Upon becoming aware of the subcontractor's failure to pay the specified prevailing rate of wages to the subcontractor's workers, the contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for work performed on the public works (City) project.

D. Prior to making final payment to the subcontractor for work performed on the public works (City) project, the contractor shall obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has paid the specified general prevailing rate of per diem wages to the subcontractor's employees on the public works (City) project and any amounts due pursuant to Section 1813 of the Labor Code.

Pursuant to Section 1775 of the Labor Code, the Division of Labor Standards Enforcement shall notify the Contractor on a public works (City) project within 15 days of the receipt by the Division of Labor Standards Enforcement of a complaint of the failure of a subcontractor on that public works (City) project to pay workers the general prevailing rate of per diem wages. If the Division of Labor Standards Enforcement determines that employees of a subcontractor were not paid the general prevailing rate of per diem wages and if the City did not retain sufficient money under the contract to pay those employees the balance of wages owed under the general prevailing rate of per diem wages, the contractor shall withhold an amount of moneys due the subcontractor sufficient to pay those employees the general prevailing rate of per diem wages if requested by the Division of Labor Standards Enforcement. The Contractor shall pay any money retained from and owed to a subcontractor upon receipt of notification by the Division of Labor Standards Enforcement that the wage complaint has been resolved. If notice of the resolution of the wage complaint has not been received by the Contractor within 180 days of the filing of a valid notice of completion or acceptance of the public works (City) project, whichever occurs later, the Contractor shall pay all moneys retained from the subcontractor to the City. These moneys shall be retained by the City pending the final decision of an enforcement action.

Pursuant to the requirements in Section 1773 of the Labor Code, the City has obtained the general prevailing rate of wages (which rate includes employer payments for health and welfare, pension, vacation, travel time and subsistence pay as provided for in Section 1773.8 of the Labor Code, apprenticeship or other training programs authorized by Section 3093 of the Labor Code, and similar purposes) applicable to the work to be done, for straight time, overtime, Saturday, Sunday and holiday

work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of workmen concerned.

The general prevailing wage rates and any applicable changes to these wage rates are available at the office of the Purchasing Division, City Hall West, 707 W. Acequia, Visalia, CA 93291. General prevailing wage rates are also available from the California Department of Industrial Relations' Internet Web Site at: http://www.dir.ca.gov.

The wage rates determined by the Director of Industrial Relations for the project refer to expiration dates. Prevailing wage determinations with a single asterisk after the expiration date are in effect on the date of advertisement for bids and are good for the life of the contract. Prevailing wage determinations with double asterisks after the expiration date indicate that the wage rate to be paid for work performed after this date has been determined. If work is to extend past this date, the new rate shall be paid and incorporated in the contract. The Contractor shall contact the Department of Industrial Relations as indicated in the wage rate determinations to obtain predetermined wage changes. Pursuant to Section 1773.2 of the Labor Code, general prevailing wage rates shall be posted by the Contractor at a prominent place at the site of the work.

Changes in general prevailing wage determinations which conform to Labor Code Section 1773.6 and Title 8 California Code of Regulations Section 16204 shall apply to the project when issued by the Director of Industrial Relations at least ten (10) days prior to the date of the Notice to Contractors for the project.

The City will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth in the contract. The possibility of wage increases is one of the elements to be considered by the Contractor in determining the bid, and will not under any circumstances be considered as the basis of a claim against the City on the contract.

7-2.3 Travel and Subsistence Payments

The Contractor shall make travel and subsistence payments to each workman, needed to execute the work, in conformance with the requirements in Labor Code Section 1773.8.

7-2.4 Payroll Records

The Contractor shall conform to the requirements in Labor Code Section 1776, a portion of which is quoted below. Regulations implementing Labor Code Section 1776 are located in Sections 16016 through 16019 and Sections 16207.10 through 16207.19 of Title 8, California Code of Regulations.

A. Each contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the project for which a Contract is awarded by the City. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

   1. The information contained in the payroll record is true and correct.
   2. The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works (City) project.

B. The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis:

1. A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.
2. A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the awarding body, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.
3. A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.

C. The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.

D. A contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.

E. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated in a manner so as to prevent disclosure of an individual's name, address and social security number. The name and address of the contractor awarded the contract or the subcontractor performing the contract shall not be marked or obliterated.

F. The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

G. The contractor or subcontractor shall have 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10 day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty five dollars ($25) (or such other amount as may be amended from time to time by the Department of Industrial Relations- added by City) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section."

The penalties specified in subdivision (g) of Labor Code Section 1776 for noncompliance with the requirements in Section 1776 may be deducted from any moneys due or which may become due to the Contractor.

For all prevailing wage projects, a copy of all payrolls shall be submitted weekly to the Engineer. Payrolls shall contain the full name, address and social security number of each employee, the employee's correct classification, total hourly rate of pay, daily and weekly number of hours worked, itemized deductions made and actual wages paid. They shall also indicate apprentices and ratio of apprentices to

journeymen. The employee's address and social security number need only appear on the first payroll on which that name appears. The payroll shall be accompanied by a "Statement of Compliance" signed by the employer or the employer's agent indicating that the payrolls are correct and complete and that the wage rates contained therein are not less than those required by the contract. The "Statement of Compliance" shall be on forms furnished by the State or on any form with identical wording. The Contractor shall be responsible for the submission of copies of payrolls of all subcontractors.

If by the 15th of the month, the Contractor has not submitted satisfactory payrolls as requested by the Engineer for all work performed during the monthly period ending on or before the first of that month, the City will retain an amount equal to 10 percent of the estimated value of the work performed during the month from the next monthly estimate, except that this retention shall not exceed $10,000 nor be less than $1,000, or such other amount as may be determined from time to time by the State Department of Industrial Relations. Retentions for failure to submit satisfactory payrolls shall be additional to all other retentions provided for in the contract. The retention for failure to submit payrolls for any monthly period will be released for payment on the monthly estimate for partial payments next following the date that all the satisfactory payrolls for which the retention was made are submitted.

The Contractor and each subcontractor shall preserve their payroll records for a period of 3 years from the date of completion of the contract.

7-2.5 Labor Nondiscrimination

The Contractor shall comply with Section 1735 of the Labor Code, which reads as follows:

"No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, or sex of such persons, except as provided in Section 12940 of the Government Code, and every contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter."

The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

7-2.6 Apprentices

For all prevailing wage projects, the Contractor and subcontractors shall comply with the provisions in Sections 1777.5, 1777.6 and 1777.7 of the California Labor Code and Title 8, California Code of Regulations Section 200 et seq. To ensure compliance and complete understanding of the law regarding apprentices, and specifically the required ratio thereunder, the Contractor and each subcontractor should, where some question exists, contact the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, CA 94102, or one of its branch offices prior to commencement of work on the contract. Responsibility for compliance with this section lies with the Contractor. It is State and City policy to encourage the employment and training of apprentices on public works contracts as may be permitted under local apprenticeship standards.

7-2.7 Workers' Compensation

Pursuant to the requirements in Section 1860 of the Labor Code, the Contractor will be required to secure the payment of workers' compensation to the Contractor's employees in conformance with the requirements in Section 3700 of the Labor Code and in accordance with the provisions of Section 7-4, “Contractor’s Insurance Requirements And Hold Harmless.”

7-2.8 Civil Wage and Penalty Assessments

The Contractor is required to comply with applicable portions of the Labor Code related to public works contracts and subject to wage and penalty assessments by the California Labor Commission for failure to abide by those requirements. The City as the awarding body will follow the requirements of the Labor Code, including Section 1727 relating to the withholding of payments due the Contractor in order to satisfy any civil wage or penalty assessments issued by the Labor Commissioner.

7-3 Contractor's Licensing Laws

All bidders and contractors shall be licensed in accordance with the laws of this State, specifically the provisions the Business and Professions Code, Division 3, Chapter 9. Any bidder or contractor not so licensed is subject to the penalties imposed by such laws.

In accordance with the requirements in Public Contract Code Section 10164, in all contracts where Federal funds are involved, the Contractor shall be properly licensed at the time the Contract is awarded.

7-4 Contractor's Insurance Requirements and Hold Harmless

Contractor hereby agrees to indemnify and hold City and its officers, agents, employees and assigns, harmless from any liability imposed for injury (as defined by Government Code 810.8), whether arising before or after completion of the work hereunder, or in any manner directly or indirectly caused, occasioned or contributed to, or claimed to be caused, occasioned or contributed to, in whole or in part, by reason of any act or omission, including strict liability or negligence of Contractor, or of anyone acting under Contractor's direction or control or on its behalf, in connection with or incident to or arising out of the performance of this contract.

It is the intent of the parties that Contractor will indemnify, defend, and hold harmless City and its officers, agents, employees, and assigns, from any and all claims, demands, costs, suits or actions as set forth above regardless of the existence of passive concurrent negligence, on the part of the City or anyone acting under its direction or control or on its behalf. It is further the intent of the parties that this indemnification requirement is not intended to relieve City from liability for the active negligence of City, its officers, agents and employees.

The Contractor shall continuously protect City property, including work under construction, from damage, loss, or liability of any kind to persons or property arising in connection with the contract, direct or indirect, including that arising from rainfall, flood waters, and other action of the elements and all acts of third parties.

This indemnity and hold harmless provision, insofar as it may be adjudged to be against public policy, shall be void and unenforceable only to the minimum extent necessary so that the remaining terms of this indemnity and hold harmless provision may be within public policy and enforceable.

In an emergency affecting the safety of life or limb, work site, or any property, the Contractor is hereby permitted and directed to act at their discretion to prevent such threatened loss of injury, and in the event any instructions are given by the City of Visalia in an emergency, the Contractor shall unconditionally comply therewith.

With respect to the performance of work under this agreement, the Contractor shall maintain and shall require all of its subcontractors to maintain insurance as described below:

Worker's Compensation insurance with statutory limits, and employer's liability insurance with limits of not less than $1,000,000 per accident.

Commercial General Liability insurance with a combined single limit of not less than $1,000,000 per occurrence. Such insurance shall include products/completed operations liability, owner's and Contractor's protective, blanket contractual liability, personal injury liability, broad form property damage coverage and explosion, collapse and underground hazard coverage. Such insurance shall (a) name City, its appointed and elected officials, officers, employees and agents as additional insureds; and (b) be primary with respect to any insurance or self-insurance programs maintained by the City; and (c) contain Standard cross liability provisions. Such additional insured endorsement maintained by contractor and its subcontractors shall not be required to provide coverage for City for the active negligence of City.

Commercial Automobile Liability insurance with a combined single limit of not less than $1,000,000 per occurrence. Such insurance shall include coverage for owned, hired and non-owned automobiles and shall be provided by a business automobile policy.

Contractor shall furnish properly executed certificates of insurance to City prior to commencement of work under this agreement, such certificates shall:

1. Clearly evidence all coverage required above, including specific evidence of a separate endorsement naming the City as an additional insured;

2. Indicate whether coverage provides is on a claims made or occurrence basis; and

3. Provide that such insurance shall not be materially changed, terminated, or allowed to expire except on 30-days prior written notice to City's Purchasing Division, Attention:

Purchasing
707 W. Acequia Avenue
Visalia, CA 93291

Such insurance shall be maintained from the time work first commences until completion of the work under this Agreement if an occurrence policy form is used. If a "claims made" policy is used, coverage shall be maintained during the contract term and for a period extending 5 years beyond the contract date. Contractor shall replace such certificates for policies expiring prior to completion of work under this agreement and shall continue to furnish certificates 5 years beyond the contract term, when Contractor has a "claims made" form(s). If Contractor, for any reason, fails to maintain insurance coverage which is required pursuant to this agreement, the same shall be deemed a material breach of contract. City, at its sole option, may terminate this agreement and/or obtain damages from the Contractor resulting from said breach. Alternatively, City may purchase such required insurance coverage, and without further notice to Contractor, City may deduct from sums due to Contractor any premium costs advanced by City for such insurance.

This insuring provision, insofar as it may be adjudged to be against public policy or in violation of Insurance Code Section 11580.04, shall be void and unenforceable only to the minimum extent necessary so that the remaining terms of the insuring provisions herein may be within public policy and enforceable.

All costs for compliance with this Section 7-4 shall be included in the various items of work; no separate payment will be made therefor.

7-5 Vehicle Code

Pursuant to the authority contained in Vehicle Code Section 591, the City has determined that within those areas that are within the limits of the project and are open to traffic, the Contractor shall comply with all the requirements set forth in Divisions 11, 12, 13, 14 and 15 of the Vehicle Code. In accordance with the statement in Vehicle Code Section 591, this section shall not relieve the Contractor or any person from the duty of exercising due care. The Contractor shall take all necessary precautions for safe operation of the Contractor's equipment and the protection of the public from injury and damage from the Contractor's equipment.

7-6 Air Pollution Control

The Contractor shall refer to the Special Provisions for a listing of the total land disturbance area associated with the project. For all projects, the Contractor shall comply with State air pollution control rules, regulations, ordinances and statutes which apply to any work performed pursuant to the contract, including any air pollution control rules, regulations, ordinances and statutes, specified in Section 11017 of the Government Code. The Contractor shall also comply with all of the requirements of Regulation VIII of the San Joaquin Valley Air Pollution Control District (APCD). It will be the Contractor's responsibility to contact the APCD to determine the requirements of said Regulation and any costs related to compliance therewith. All costs for compliance, including any permit fees, shall be included in the various items of work; no separate or additional payment will be made therefor. Reference is made to Section 7-10, "Permits and Licenses."

For Public projects, in addition to the foregoing requirements, for projects specified in the Contract Specifications to be subject to Rule 9510 of the APCD, the Contractor shall, before submitting a bid, contact the APCD and determine the project-specific requirements of said Rule. Any project-specific permit fee will be paid by the City. All other costs for compliance with the Rule 9510 requirements, including submittal of all required documentation during the life of the project, shall be included in the various items of work. No separate or additional payment will be made therefor. Reference is made to Section 7-10, "Permits and Licenses."

For Non-Public projects, the individual, group, or entity that owns the project will be responsible for all costs associated in complying with APCD Rule 9510.

The Contractor shall also comply with the provisions in Section 10, "Dust Control."

7-7 Water Pollution Prevention

The work for which a Contract is awarded is subject to the provisions and requirements of the State General Construction Activity Storm Water Permit (General Construction Permit). The Contractor shall be responsible for complying with all current General Construction Permit requirements, as adopted and enforced by the State Water Resources Control Board (SWRCB) including any future revisions to that permit. The Contractor shall indemnify, and hold harmless the City for failure to comply with any provision or requirement of the General Construction Permit.

The Contractor shall exercise every reasonable precaution and shall conduct and schedule operations so as to protect all storm drain systems, storm water retention/detention basins, irrigation canals, or natural streams located within, adjacent to, or in any way connected with, the project from pollution with mud, silt, fuels, oils, bitumens, calcium chloride, pesticides, herbicides, and any other harmful materials. The Contractor shall conduct water pollution prevention on all contracts awarded by the City as required by this Section. For Non-Public projects the individual, group, or entity that owns the project will be responsible for performing all permitting and all water pollution prevention in accordance with this

section. The Contractor shall refer to the Special Provisions for a listing of the total land disturbance area associated with the construction project to determine which section applies to this project.

For Projects with a land disturbance area less than 1 acre:
The project is under the minimum threshold of the State Water Resource Control Board (SWRCB) General Construction Permit and does not require a project specific Storm Water Pollution Prevention Plan (SWPPP). However, the contractor shall be responsible for developing a water pollution control drawing and implementing appropriate Best Management Practices (BMP's) throughout construction to eliminate any pollutants from entering the city storm drainage system, irrigation canals, or natural streams. BMP's required for the project may include, but are not limited to: Storm Drain Inlet Protection, Wind Erosion Control, Stabilized Construction Entrance/Exit, Street Sweeping and Vacuuming, Material Delivery and Storage, Stockpile Management, Solid Waste Management, Hazardous Waste Management, Concrete Waste Management, Sanitary/Septic Waste Management, and Liquid Waste Management. A copy of the California Stormwater Quality Association (CASQA) BMP handbook can be printed at the following website address http://www.cabmphandbooks.com/.

For Projects with a land disturbance area greater than 1 acre:
The project results in a land disturbance of greater than one acre and is therefore over the minimum threshold of the State Water Resource Control Board (SWRCB) General Construction Permit and requires a project specific Storm Water Pollution Prevention Plan (SWPPP). The SWPPP shall meet the requirements of California's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Construction General Permit SWRCB Order No. 2009-0009-DWQ as amended from time to time. Construction work shall not commence until the SWPPP is completed, approved, and all fees are paid.

The Contractor shall retain at his own expense a consultant certified as a Qualified SWPPP Developer (QSD) under the requirements of the General Permit to develop the SWPPP and complete all of the required information/uploading on the State's Storm Water Multiple Application and Report Tracking System (SMARTS). A City of Visalia representative will be available to act as the Legally Responsible Person (LRP) under the SMARTS system. Prior to certification, the Contractor shall provide the City with two (2) hard copies of the SWPPP and all associated documents for review and approval. The LRP will review the documents developed by the Contractor and will request revisions/changes as the LRP deems necessary. Upon approval by the city, the Contractor shall upload the final documents to SMARTS and the project will be certified by the LRP. The Contractor will be responsible for providing to the City of Visalia two (2) hard copies of the final SWPPP and all associated documents upon approval by the City. The SWPPP will cover all work within the project limits.

The Contractor shall retain a Qualified SWPPP Practitioner (QSP) at his own expense. The QSP shall be responsible for the implementation and adequate functioning of the various water pollution control practices employed. The QSP shall serve as the primary contact for issues related to the SWPPP or its implementation.

Unless otherwise specified, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing, and disposing of the water pollution control practices and BMP's specified in the SWPPP and in the amendments.

The Contractor will be responsible for complying with all of the requirements of the approved SWPPP. This includes furnishing all the materials and labor necessary for implementation and maintenance of the site. It shall be the Contractor's responsibility to perform all of the record keeping and annual reporting (as required) along with filing the final Notice of Termination (NOT) upon project completion.

Throughout the duration of the project the Contractor shall be responsible for providing two (2) hard copies to the City of all Annual Reports and other required reporting documentation. Upon completion of the project the Contract shall provide two (2) hard copies of the final Notice of Termination, and any documents required to be on file with the project owner according to the requirements of the General Permit.

Small Construction Erosivity Waiver:
Projects that disturb between one and five acres of surface area are eligible for the EPA's Small Construction Erosivity Waiver. If this project is eligible for the waiver, the Contractor will be required to complete all of the on-line SMARTS uploading and documentation noted under this section insofar as it is required to obtain the Erosivity Waiver. A minimum of seven (7) working days prior to construction, the Contractor will be required to submit a Storm Water Pollution Control Plan to the City of Visalia for review and approval. The Storm Water Pollution Control Plan shall show all of the Best Management Practices (BMP's) that will be implemented throughout construction to eliminate any pollutants from entering the city storm drainage system. BMP's required for the Project may include, but are not limited to: Storm Drain Inlet Protection, Wind Erosion Control, Stabilized Construction Entrance/Exit, Street Sweeping and Vacuuming, Material Delivery and Storage, Stockpile Management, Solid Waste Management, Hazardous Waste Management, Concrete Waste Management, Sanitary/Septic Waste Management, and Liquid Waste Management. Upon approval of the Storm Water Pollution Control Plan by the city, the contractor will be responsible for providing to the City of Visalia two (2) hard copies of all of the required Erosivity Waiver documents and the Storm Water Pollution Control Plan.

7-7.1 Payment

Unless otherwise provided by the Construction Specifications, the contract lump sum price paid for Water Pollution Prevention shall include, but not be limited to, full compensation for preparation and implementation of the Stormwater Pollution Prevention Plan (SWPPP), furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing, constructing, maintaining, removing, and disposing of all water pollution control practices and in implementing, developing, obtaining approval of, including associated fees, revising, amending, inspecting and annual reporting necessary to comply with the requirements of this Section 7-7. If no bid item is provided, the cost shall be included in the various items of work; no separate payment will be made therefor.

7-8 Use of Pesticides

The Contractor shall comply with all rules and regulations of the California Department of Food and Agriculture, the Department of Public Health, the Department of Industrial Relations and all other State, Federal or Local agencies which govern the use of pesticides required in the performance of the work on the contract. Pesticides shall include but shall not be limited to herbicides, insecticides, fungicides, rodenticides, germicides, nematocides, bactericides, inhibitors, fumigants, defoliants, desiccants, soil sterilants and repellents. Any substance or mixture of substances intended for preventing, repelling, mitigating, or destroying weeds, insects, diseases, rodents, or nematodes and any substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant shall be considered a pesticide.

7-9 Payment of Taxes

The contract prices paid for the work shall include full compensation for all taxes which the Contractor is required to pay, whether imposed by Federal, State or local government, including, without being limited to, Federal Excise Tax.

No tax exemption certificate nor any document designed to exempt the Contractor from payment of any tax will be furnished to the Contractor by the City as to any tax on labor, services, materials, transportation, or any other items furnished pursuant to the contract.

7-10 Permits and Licenses

Unless otherwise provided in the Contract Documents, the Contractor shall procure all required permits and licenses and give all notice necessary and incidental to the due and lawful prosecution of the work prior to commencing any construction activities. The Contractor shall abide by the provisions of said permits and associated reference documents.

The Contractor and all subcontractors must comply with the Insurance and Business Tax Certificate provisions of Section 3-3, "Required Contract Securities, Insurance Certificate, Business Tax Certificate, Injury and Illness Prevention Plan."

For all Non-Public work, an Encroachment Permit is required from the City Engineering Division before any work in the street or other City right of way is commenced. For Public work projects for which a Contract has been awarded by the City, the Contractor must obtain an Encroachment Permit from the City Engineering Division prior to commencing work unless otherwise specified by the Contract Documents. There will not be a fee charged for the Encroachment Permit for a City Public works projects. All Contractors will be required to follow the conditions of the Encroachment Permit and the City of Visalia Encroachment Permit Policy Manual, latest edition.

Satisfactory evidence of obtaining all required permits and licenses, including the Contractor's and subcontractors' Business Tax Certificates, shall be submitted to the Engineer with the executed contract and other documents required by the Construction Specifications prior to commencing construction activities. The Contractor shall abide by the conditions of said permits and licenses and perform all work governed by said permits and licenses in conformance therewith and as directed by the Engineer. Compliance with this Section 7-10 shall be a condition of issuance of the "Notice to Proceed."

Except as provided in Section 7-6, "Air Pollution Control," relating to Rule 9510, and unless otherwise provided in the Contract Specifications, full compensation for all costs involved in procuring all permits and licenses as indicated herein, including all fees and charges therefor, shall be included in the amount bid for the various items of work; no separate payment shall be made therefor.

The Contractor shall be responsible for paying any fees or fines that result from the Contractor's failure to follow the requirements or conditions of any permits, regulations, or associated reference documents. The City reserves the right to deduct any fees or fines from the monies due to the Contractor. The cost shall be levied as a fine in the case of non-public work.

7-11 Sanitary Regulations

Necessary housing accommodations shall be provided by the Contractor for the workmen for changing clothes and for protection during inclement weather. Toilet accommodations shall also be maintained for the use of employees on the work. The accommodations shall be in approved locations properly screened from public observation and shall be maintained in a strictly sanitary manner. The Contractor shall obey and enforce all State, County, and City sanitary regulations and orders, and shall take precautions against infectious diseases and the spread of same, and shall maintain at all times satisfactory sanitary conditions around all shanties, tool and supply houses and on all other parts of the work.

The cost of compliance with this Section 7-11 shall be included in the various bid items of work; no separate payment will be made therefor.

7-12 Safety Provisions; First Aid; Injury/ Illness Prevention Program

The Contractor shall comply with the provisions of the State Labor Code, Division 5, "Safety in Employment," the State Division of Occupational Safety and Health Construction Safety Orders and General Industry Safety Orders of Title 8, California Code of Regulations, as well as all other applicable laws, ordinances and regulations.

In compliance with State Labor Code Section 6708, the Contractor shall maintain adequate emergency first aid treatment for his employees sufficient to comply with the Federal Occupational Safety and Health Act of 1970 (Public Law 91-596).

In compliance with Labor Code Section 6401.7, the Contractor shall have established, implemented, and maintains an Injury and Illness Prevention Plan. The Contractor shall comply with Section 3-3, "Required Contract Securities, Insurance Certificate, Business Tax Certificate, Injury and Illness Prevention Plan," for plan submittal requirements.

Full compensation for all costs involved in providing job safety, worker protection, and emergency first aid treatment shall be included in the amounts bid for the various items of work; no separate payment will be made therefor.

7-13 Worker Protection from Toxic or Explosive Gases; Confined Spaces Entry

In conformance with the provisions of the State Labor Code and the Safety Orders set forth in Section 7-12, "Safety Provisions; First Aid; Injury/Illness Prevention Program," the Contractor shall protect workers from toxic or explosive gases by providing whatever testing equipment and other special equipment that may be needed to detect the presence of and to remove such toxic or explosive gases found or suspected to exist in any above or below ground facilities whether newly constructed or existing, excavations, or other activities involved in the work. Detection and removal shall be accomplished by methods which comply with the regulations governing such detection and removal. The Engineer and the City Fire Department should be notified immediately after detection.

The Contractor shall also comply with the provisions of the California Code of Regulations Title 8 General Industry Safety Orders, Article 108, "Confined Spaces," whenever the contractor or any of his employees must enter a confined space, as defined in said Safety Orders, whether the confined space is new or existing.

The above requirements are minimum requirements. In addition, the Contractor shall provide for the life of the Contract similar protection for any person, including the Engineer or any of his authorized representatives, subcontractors, or any other person authorized or required to enter such underground facilities for inspection, repairs, or any other reason.

If the presence of toxic or explosive gases are due to the actions of the contractor, then all costs for worker protection, detection, removal, or repairs are to be borne by the contractor. If the presence of toxic or explosive gases are the result of latent or other conditions outside the control of the Contractor, then compensation will be paid in accordance with Section 4-10, "Changes." In the event of a dispute, nothing in this Section 7-13 shall free the contractor of the responsibility to immediately take the necessary actions to provide worker protection and to remove or repair the cause of the presence of toxic or explosive gases.

All costs for compliance with this Section 7-13 shall be included in the various bid items; no separate payment will be therefor.

7-14 Trenches and Excavations; Hazardous Waste

7-14.1 Trenches and Excavations 4 Feet or Less In Depth Below the Surface

If the Contractor encounters conditions at the Site which are subsurface or otherwise concealed physical conditions, which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the Contractor shall be given to the City immediately before conditions are disturbed. The City will promptly investigate such conditions, and if they differ materially and cause an increase or decrease in the Contractor's cost of, time required for, or performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum, Contract Time, or both. If the City determines that the conditions at the Site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the City shall so notify the Contractor in writing, stating the reasons. Claims by Contractor in opposition to such determination must be made within five (5) days after the City has given notice of the decision. If the City and the Contractor cannot agree on an adjustment in the Contract Sum or the Contract Time, Contractor shall proceed pursuant to Section 4-12, "Notices, Change Orders, and Claims."

7-14.2 Trenches and Excavations Greater Than 4 Feet In Depth; Hazardous Waste

Pursuant to Section 7104 of the State Public Contract Code, whenever the work requires digging trenches or other excavations that extend deeper than four feet below the surface, the following provisions apply:

A. The contractor shall promptly, and before the following conditions are disturbed, notify the Engineer, in writing, of any:

   1. Material that the contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.
   2. Subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids.
   3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

B. The Engineer shall promptly investigate the conditions, and if he finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the work shall issue a change order in accordance with Section 4-10, "Changes."

C. In the event that a dispute arises between the Engineer and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

The Contractor shall comply with the requirements in Section 5-12, "Disposal of Material Outside the Right of Way."

7-15 Worker Protection from Caving Ground in Excavations

The Title 8 Construction Safety Orders of the Division of Occupational Safety and Health shall apply to all excavations. In compliance with Sections 341 and 341.1 of Title 8, California Code of Regulations, and Section 6500 of the State Labor Code, for any trenches or excavations that are 5 feet or more in depth, the Contractor must obtain a permit from the State Division of Occupational Safety and Health. The permit may be either a Project Permit (project specific) or an Annual Permit. The contractor shall comply with all the requirements of the permit and those of the Safety Orders.

In addition to the above permit requirement, in compliance with the provisions of State Labor Code 6705, the Contractor shall submit to the Engineer, in advance of any excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of trenches five feet or more in depth. If such plan varies from the shoring system standards of the State Division of Occupational Safety and Health, the plan shall be prepared, stamped and signed by a Civil or Structural Engineer registered in the State of California. Nothing in this subsection shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the DOSH Construction Safety Orders.

The requirements as above set forth by the State Division of Occupational Safety and Health and the State Labor Code for the provision of worker protection from the hazard of caving ground are minimum requirements. In addition, the Contractor shall provide, for the life of the Contract, the same protection for any person, including the Engineer or any of his authorized representatives, subcontractors, certified testing laboratory staff, or any other person required to be exposed to such hazard in the performance of the work, inspection of the work, or any other reason.

Payment for Worker Protection from caving ground in excavations during construction shall be made at the lump sum price bid therefor; no additional payment will be made. Payment shall include all materials, labor and equipment necessary to adequately brace, shore, shield or slope all excavations and trenches as required by the Division of Occupational Safety and Health Title 8 Construction Safety Orders. Also included are any costs incurred by the Contractor in obtaining all required OSHA permits and preparing a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection as required by State Labor Code Section 6705.

If the bid item therefor is based on a lump sum amount, payment will be pro-rated on the basis of the ratio of completed length of trench or other excavation requiring Worker Protection to the total length of trench or other excavation requiring Worker Protection.

If no bid item is included in the bid schedule for the work associated with this Section 7-15, full compensation for conforming to all of the provisions in this Section 7-15 shall be considered as included in the prices paid for the various contract items of work requiring worker protection; no additional compensation will be allowed therefor.

7-16 Injury or Damage to Persons or Property

Reference is made to Section 5-3, "Contractor's Responsibility For The Work," Section 5-9, "Preservation of Property," Section 7-4, "Contractor's Insurance Requirements and Hold Harmless," and Section 7-16, "Injury or Damage to Persons or Property." Neither the City Council, the Engineer, nor any other officer, authorized agent, employee or volunteer shall be personally responsible for any liability arising under the Contract. The Contractor shall indemnify and hold harmless the City, the City Council, the Engineer, and all City Officers, Employees, agents and volunteers from any suits, claims, damages, losses, liability, demands, or actions brought by any person or persons for or on account of any injuries or damage sustained in or arising out of the construction of the Work or in consequence thereof. The City

Council may retain as much of the money due the Contractor as shall be considered necessary until disposition has been made of such suits or claims for damages as aforesaid.

If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, any of the other party's employees or agents, or others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding ten (10) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be made as provided in Section 4-12, "Notices, Change Orders, and Claims."

7-17 Public Convenience

This Section 7-17 defines the Contractor's responsibility with regard to convenience of the public and traffic in connection with the Contractor's operations. Section 7-18, "Public Safety," provides requirements relating to the Contractor's responsibility for the safety of the public. The provisions in Section 7-18 are in addition to the provisions in this Section 7-17, and the Contractor will not be relieved of the responsibilities as set forth in Section 7-18 by reason of conformance with any of the provisions in this Section 7-17.

The Contractor shall adhere to the provisions of Section 4-14, "Detours," and Section 12, "Traffic Control; Construction Area Traffic Control Devices," concerning traffic control requirements, flagging and traffic handling equipment and devices used in carrying out the provisions in this Section 7-17 and said Section 7-18, and for provisions relating to the passage of traffic over or around the work by detours, and other traffic.

In the event of a suspension of the work, the provisions of Section 8-11, "Temporary Suspension of Work," will apply.

The Contractor shall so conduct operations as to offer the least possible obstruction and inconvenience to the public and shall have under construction no greater length or amount of work than can be prosecuted properly with due regard to the rights of the public. Unless otherwise provided in the Contract Documents or approved by the Engineer, all public pedestrian and vehicular traffic shall be permitted to pass through the work with as little inconvenience and delay as possible. All traffic shall be routed on new or existing paved surfaces, unless approved otherwise by the Engineer in writing.

Existing traffic signals and highway lighting within the project area or affected by the work shall be kept in operation for the benefit of the traveling public during progress of the work. Unless otherwise provided in the Contract Documents, the Contractor shall be responsible for routine maintenance of existing systems.

Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners. Convenient access to driveways, houses, and buildings along the line of the work shall be maintained and temporary approaches to crossings or intersecting streets shall be provided and kept in good condition. When the abutting property owner's access across the right of way line is to be eliminated, or to be replaced under the contract by other access facilities, the existing access shall not be closed until the replacement access facilities are usable. Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately by the Contractor at the Contractor's expense.

Water or dust palliative shall be applied if ordered by the Engineer for the alleviation or prevention of dust nuisance as provided in Section 10, "Dust Control."

The Contractor will be contacted when a situation or condition is identified as a PUBLIC INCONVENIENCE by the Engineer. An appropriate response time will be granted (usually 24 hours) to the Contractor. If the issue is not resolved by the Contractor, then the City may impose a penalty at the rate of Two Hundred and Fifty Dollars ($250.00) per calendar day for each day beyond the specified response time date. Maximum penalty is One Thousand Dollars ($1,000.00). In addition or as an alternative to the penalty the City may impose the costs of corrective actions taken by the City if Contractor fails to remedy the identified PUBLIC INCONVENIENCE. The City may, at its option, take corrective action following the expiration of the response time given to the Contractor unless the issue creates a public hazard, then the City may take action immediately and charge the Contractor. All costs incurred by the City for taking such corrective action, will be deducted from monies owed the Contractor or will be levied as a fine to the Contractor in the case of non-public work being done under permit. Alternatively if City Municipal Codes are violated the Contractor may be subject to administrative fines and penalties under those ordinances.

The provisions of Section 9-9, “Stop Notices; City’s Right to Withhold Payments,” will apply.

Full compensation for conforming to the provisions in this Section 7-17 shall be considered as included in the prices paid for the various contract items of work; no additional compensation will be allowed therefor.

7-18 Public Safety

The Contractor shall provide for the safety of traffic and the public during construction. The Contractor’s attention is directed to the provisions of Section 7-4, “Contractor’s Insurance Requirements and Hold Harmless,” Section 7-16, “Injury or Damage to Persons or Property,” and Section 7-17, “Public Convenience,” relating to the Contractor's responsibility for providing for the convenience and safety of the public in connection with the Contractor's operations.

The provisions of Section 12, "Traffic Control; Construction Area Traffic Control Devices," concerning flagging and traffic handling equipment and devices used in carrying out the requirements of Section 7-17, “Public Convenience,” apply to this Section 7-18.

Whenever the Contractor's operations create a condition hazardous to traffic or to the public, the Contractor shall, at the Contractor's expense and without cost to the City, furnish, erect and maintain those fences, temporary railing (Type K), barricades, lights, signs and other devices and take such other protective measures that are necessary to prevent accidents or damage or injury to the public. Fences, temporary railing (Type K), barricades, lights, signs, and other devices furnished, erected and maintained by the Contractor, at the Contractor's expense, are in addition to any construction area traffic control devices for which payment is provided for elsewhere in these specifications.

The Contractor shall also furnish such flaggers as are necessary to give adequate warning to traffic or to the public of any dangerous conditions to be encountered, and payment therefor will be made as provided in Section 12, “Traffic Control; Construction Area Traffic Control Devices.”

Signs, lights, flags, and other warning and safety devices and their use shall conform to the requirements set forth in Part 6 of the California MUTCD. Signs or other protective devices furnished and erected by the Contractor, at the Contractor's expense, as above provided, shall not obscure the visibility of, nor conflict in intent, meaning and function of either existing signs, lights and traffic control devices or any

construction area signs and traffic control devices for which furnishing of, or payment for, is provided elsewhere in the specifications. Signs furnished and erected by the Contractor, at the Contractor's expense, shall be approved by the Engineer as to size, wording and location.

The installation of general roadway illumination shall not relieve the Contractor of the responsibility for furnishing and maintaining any of the protective facilities herein before specified.

All movements of workmen and construction equipment on or across lanes open to public traffic shall be performed in a manner that will not endanger public traffic and be in conformance with Section 7-5, "Vehicle Code."

When leaving a work area and entering a roadway carrying traffic, the Contractor's equipment whether empty or loaded shall in all cases yield to traffic.

No material or equipment shall be stored where it will interfere with the free and safe passage of public traffic, and at the end of each day's work and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructions from that portion of the roadway open for use by public traffic unless noted otherwise in the Special Provisions.

Temporary facilities which the Contractor uses to perform the work shall not be installed or placed where they will interfere with the free and safe passage of public traffic. Temporary facilities which could be a hazard to public safety if improperly designed shall comply with design requirements specified in the contract for those facilities or, if none are specified, with standard design criteria or codes appropriate for the facility involved. Two (2) copies of working drawings and design calculations for the temporary facilities shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California or a traffic control plan designer that is IMSA or ATSSA certified, and shall be submitted to the Engineer for approval pursuant to Section 4-4, "Working Drawings." The submittals shall designate thereon the standard design criteria or codes used. Installation of the temporary facilities shall not start until the Engineer has reviewed and approved the drawings.

Should the Contractor appear to be neglectful or negligent in furnishing warning devices and taking protective measures as above provided, the Engineer may direct attention to the existence of a hazard and the necessary warning devices shall be furnished and installed and protective measures taken by the Contractor at the Contractor's expense. Should the Engineer point out the inadequacy of warning devices and protective measures, that action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety or abrogate the obligation to furnish and pay for these devices and measures.

In accordance with Section 5-8, "Emergency Availability" in the event a condition or situation develops either during or after normal work hours which requires the attention of the Contractor, the following process applies:

If the condition or situation presents a clear and imminent public hazard and is deemed by the Engineer to be an EMERGENCY, and in the event the Contractor fails to immediately respond to the Engineer's direction to correct the condition, or attempts to contact the after-hours emergency response personnel of the Contractor fail, or in the event contact is made and the Contractor is either unwilling or unable to respond in a timely manner to the condition or situation deemed an emergency by the Engineer, then the Engineer shall mobilize immediately the resources necessary to respond to the situation. This includes a stop work order until the situation is remedied. In case of such an order any delays will be attributed to the Contractor.

In the event a condition or situation is deemed by the Engineer to present a potential public hazard and is considered to be URGENT, and upon notification thereof by the Engineer to the Contractor the condition is not corrected within 3 hours, or in the event attempts to contact the after-hours emergency response personnel of the Contractor fail, or in the event contact is made and the Contractor is either unwilling or unable to respond within three hours of contact, then the condition or situation deemed a HAZARD will be upgraded to an EMERGENCY by the Engineer, and the appropriate measures as above provided will be taken.

Due care will be taken to effect only those measures necessary to remove the emergency or urgent condition or situation. The Contractor will be invoiced for all direct costs incurred by the City plus the City may impose administrative penalties for violations of City municipal codes requiring the preparation and adherence to a traffic control plan. All costs incurred by the City for taking such corrective action will be deducted from monies owed the Contractor. Parties not under contract to the City but subject to these Standard Specifications will be billed for the City's costs.

The foregoing process shall apply to all Contracts awarded by the City and also to Encroachment Permits issued by the City to Contractors for non-public work projects. The provisions of Section 9-9, "Stop Notices; City's Right to Withhold Payments," will apply.

Except as otherwise provided in this Section 7-18 or in the Construction Specifications, full compensation for conforming to all of the provisions in this Section 7-18 shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

7-19 Patents

The Contractor shall be responsible for the use of patented materials, equipment, devices, or processes used on or incorporated in the work. The Contractor shall assume all costs arising from the use of patented materials, equipment, devices or processes used on or incorporated in the work, and agrees to indemnify and hold harmless the City, the Engineer, and their duly authorized representatives, from all suits at law, losses, liability, demands, claims, or actions of every nature for, or on account of the use of any patented materials, equipment, devices or processes.

7-20 Property Rights of Materials

Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil, or after payment has been made for 90 percent of the value of materials delivered to the site of the work or stored subject to or under the control of the City. All such materials shall become the property of the City upon being so attached or affixed or upon payment of 90 percent of the value of materials delivered to the site of the work or stored subject to or under the control of the City. As provided in Subsection 5-3, "Contractor's Responsibility for the Work," the Contractor shall care for and protect the work until final acceptance of the work by the City.

7-21 Amendments to Contracts

Each and every provision of law and clause required by law to be inserted in the Contract for the work to be done under the Specifications and Contract Documents shall be deemed to be inserted therein, and the Contract shall be read and enforced as though it were included therein; and if, through mere mistake or otherwise, any such provision is not inserted or is not correctly inserted, then upon the application of either party thereto, the Contract shall forthwith be physically amended to make such insertion.

7-22 Verbal Statements not Binding

It is understood and agreed that the written terms and provisions of the Contract shall supersede all verbal statements of the Engineer or other representatives of the City and such statements shall not be effective, or be construed as entering into or forming a part of, or altering in any way whatsoever the written agreement.

7-23 Guarantee

Whether working under a City Contract or under Encroachment Permit for Utility, Communications, or non-public work, the Contractor shall guarantee the proper installation and performance of all equipment, facilities and materials installed, including all landscape plantings and irrigation systems, or work performed pursuant to the Plans, Specifications, these Contract Documents, or City Encroachment Permit, for a period of one year from the date of the Final Acceptance by the City, or other period set forth in the Contract Documents. The Final Acceptance process varies depending on the scope of work done under the Encroachment Permit. For City Public Projects the work shall be guaranteed for a period of one year from the date of recordation of the Notice of Completion approved by the City Council. Any failure of equipment, facilities, landscape planting, or workmanship prior to the end of the one-year or other specified period shall be repaired or corrected by the Contractor at his sole expense in accordance with instructions of the Engineer. The provisions of Sections 3-5, "Material Statement, Samples and Guarantees," 5-23, "Guarantee of Workmanship," and 6-10, "Guarantee of Materials," also apply.

7-24 Firearms Prohibited

Guns may not be carried by contractors/vendors/consultants while working on City of Visalia premises without the expressed written approval of a City of Visalia Department Head, or an exemption in the contract. If a contractor/vendor/consultant is caught carrying a gun, without City permission, their contract will be terminated.

7-25 Sound Control Requirements

The Contractor's work shall conform to all municipal ordinances pertinent to noise, including but not limited to, the City of Visalia's Municipal Code Chapter 8.36.

SECTION 8 PROGRESS AND PROSECUTION

8-1 Sequence and Progress of the Work

Unless otherwise provided in the Contract Documents, the Contractor shall direct the order and sequence of work and coordinate the construction of the several parts of the Contract to a successful completion as rapidly as possible. If the Engineer determines, at any time, that equipment or appliances used, or to be used, are insufficient or improper for securing the quality of work required or the required rate of progress, the Engineer may order the Contractor to increase efficiency, or to improve their character. The Contractor shall conform to such order; but the failure of the Engineer to demand any increase of such efficiency or any improvement shall not release the Contractor from the obligation to secure the quality of work, or the rate of progress specified.

8-2 Assignment of Contract

The Contractor shall not assign the Contract or any part thereof, without the approval of the City or without the consent of surety unless the surety has waived its rights to notice of assignment. Consent will not be given to any proposed assignment which would relieve the original Contractor or the Contractor's surety of their responsibilities under the contract. All assignments of funds are subject to the prior lien for services rendered or materials supplied for the performance of the work called for in favor of all persons, firms, or corporation rendering such services or supplying materials, and all deductions provided for in the contract and particularly all monies withheld, whether assigned or not, shall be subject to being used by the City for the completion of the work in the event that the Contractor should be in default therein.

8-3 Subcontracting

Section 2-8, "Designation of Subcontractors," sets forth the requirement that any subcontractor who performs in excess of one half of one percent (1/2 %) of the original contract price, or in the case of a street project so designated by the City, one half of one percent (1/2 %) or $10,000, whichever is greater, shall be designated on the Bid Proposal Form. As a part of the bid document, the Contractor shall file with the Engineer a written statement showing the work to be subcontracted, the names of the subcontractors and the description of each portion of the work to be subcontracted.

In accordance with Section 4109 of the State Public Contract Code, subcontracting of any portion of the work in excess of one-half of one percent of the Contractor's total bid for which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity. It will be the Contractor's responsibility to submit to the Engineer the facts constituting a public emergency or necessity. If approved by the Engineer, a finding in writing will be made a part of the public record setting forth the City's decision and the reasons therefor.

The Contractor shall give personal attention to the fulfillment of the contract and shall keep the work under the Contractor's control. No subcontractor will be recognized as such, and all persons engaged in the work of construction will be considered as employees of the Contractor and the Contractor will be held responsible for their work, which shall be subject to the provisions of the contract and specifications. When a portion of the work which has been subcontracted by the Contractor is not being prosecuted in a manner satisfactory to the Engineer, the subcontractor shall be removed immediately on the requisition of the Engineer and shall not again be employed on the work. The Contractor shall be responsible for the coordination of all trades, subcontractors, and material handlers engaged in the work. Neither the City nor the Engineer will undertake to settle any differences between the Contractor and its subcontractors or between subcontractors.

Subcontracts shall include provisions that the contract between the City and the Contractor is part of the subcontract, and that all terms and provisions of the contract are incorporated in the subcontract.

Subcontracts shall also contain certification by the subcontractor that the subcontractor is experienced in and qualified to do, and knowledgeable about, the subcontracted work. Copies of subcontracts shall be available to the Engineer upon written request, and shall be provided to the Engineer at the time any litigation against the City concerning the project is filed.

Pursuant to the provisions of Section 6109 of the Public Contract Code, the Contractor shall not perform work under the contract with a subcontractor who is ineligible to perform work on the project pursuant to Section 1777.1 or 1777.7 of the Labor Code.

The purchase of concrete, liquid asphalt, paving asphalt, pipelines, valves, fire hydrants, casing, or any other materials produced at and supplied from established and recognized commercial plants, together with delivery of such materials to the site of the work by means of vehicles owned or operated by such plants or by recognized commercial hauling companies, shall not be considered as subcontracting under these Standard Specifications.

Nothing contained in the Contract documents shall create any contractual relation between any subcontractor and the City.

8-4 Preconstruction Conference

The City of Visalia should hold a preconstruction conference with the Contractor and other entities affected by the work within ten (10) days after the City Council awards the Contract. The preconstruction meeting shall be the proper time and place for the Contractor to submit to the Engineer required documents including, as a minimum, the following:

Construction Schedule - Section 8-5
Traffic Control Plan - Section 12-2
Names of Superintendent - Section 5-7
Emergency Contact List - Section 5-8
Proposed Notice to Residents - Section 8-7
Completed Encroachment Permit Application - Section 8-6
Material Submittal Package – Section 6-13

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

8-5 Construction Schedule

After notification of award and prior to start of any work, at the pre-construction conference the Contractor shall submit to the Engineer for acceptance his proposed construction schedule. Acceptance or lack of rejection by City of a proposed construction schedule shall not be deemed approval and shall not create responsibility on the part of the City for any defects or mistakes in the schedule. The Contractor bears sole responsibility for the accuracy, utility and reasonableness of the schedule. The construction schedule shall be in the form of a tabulation, chart, or graph in Gantt type format and shall be in sufficient detail to show the chronological relationship of all activities of the project including, but not limited to, estimated starting and completion dates of various activities, (including early and late dates and float for each activity), procurement of materials, the critical path, and scheduling of equipment. The construction schedule shall be consistent in all respects with the time and order of work requirements of the Contract.

The Contractor shall submit an updated schedule on the first working day of the month on a monthly basis that includes an accurate as-built schedule and the current as-planned schedule. If the Contractor

fails to submit the monthly schedule the Engineer shall have the option to suspend the work at the Contractor's expense until such time that a monthly schedule is submitted. The Contractor shall submit its daily logs for the month with the updated schedule. Float shall be used by the parties on a "first come, first serve" basis. If the Contractor desires to make a significant change in his method of operations after commencing construction, he shall submit to the Engineer an updated construction schedule in advance of beginning revised operations. If the Contractor's actual progress falls behind the scheduled progress, within seven (7) days of a City request the Contractor shall prepare and submit an updated schedule showing how the Contractor intends to complete the work within the scheduled completion deadline.

All schedules submitted by the Contractor shall be certified as true and correct.

If extra work is performed under the contract and the Contractor claims that additional time should be granted because the critical path is affected, the Contractor shall be responsible for submitting a full time impact analysis for the project to justify the extension of time requested. The time impact analysis shall be submitted in a format acceptable to the engineer.

The Contractor may not maintain any Claim or cause of action against the City for damages incurred as a result of its failure or inability to complete the Work in a shorter period than established in the Contract. By executing a Contract with the City, the parties stipulate that the period set forth in the Contract is a reasonable time within which to perform the Work.

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

8-6 Beginning of Work

The City of Visalia should hold a preconstruction conference with the Contractor and other entities affected by the work within ten (10) days after the City Council awards the Contract. After this preconstruction conference is held, the Contractor will have fifteen (15) days to obtain an approved Encroachment Permit from the City and furnish all other permits and approvals required to complete the work. The Contractor shall submit the completed Encroachment Permit Application and required documents to the City at the preconstruction meeting or within five (5) days after the meeting. The Contractor shall allow ten (10) days for the City to review and approve/request modifications to the documents. Should the Contractor fail to obtain the required permits and approvals within this fifteen (15) day period, the length of time beyond fifteen (15) days will be subtracted as working days from the Contract. After the Contractor has furnished all of the required permits and documents the Notice to Proceed with Construction will be issued. Unless otherwise provided in the Contract Specifications, the Contractor shall commence work under the contract within ten (10) days after the date the Notice to Proceed is issued by the City and shall diligently prosecute the same to completion within the time limit provided in the Contract Documents. The Contractor shall not begin work in advance of receiving the Notice to Proceed without written authorization from the Engineer. **The Contractor shall notify the Inspector a minimum of 2 working days prior to starting work.** The timelines above apply to the Contract unless noted otherwise in the Special Provisions.

It shall be the obligation of the Contractor to notify the various utility companies at least five (5) working days in advance of closing and/or excavation of any street or alley affecting said companies. The Contractor shall contact Underground Service Alert (USA) at 1-800-227-2600 or 811 a minimum of five (5) working days prior to any excavation.

The locations of existing facilities that are shown on the Plans are approximate. Exact locations of existing utilities shall be determined by the Contractor by whatever means necessary, including potholing

and hand digging, with the possible assistance of the utility companies and located in the field by the Contractor prior to the construction of any improvements required by the Contract. Prior to construction the Contractor will be responsible for verifying that no conflicts exist between existing and proposed street and utility infrastructure improvements. Any additional expenses incurred because of the failure of the Contractor to comply with these requirements shall be borne by the Contractor.

Five (5) working days prior to beginning work and after the USA markings have been completed at the site, the Contractor shall be responsible for scheduling a pre-construction site walk through with the Engineer, Inspector, and any other interested agencies. The purpose of the site walk will be to identify any existing utilities that have the potential to conflict with the proposed improvements.

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

8-7 Notice to Residents

Not less than two (2) calendar days nor more than five (5) calendar days prior to proceeding with the work in any given area, the Contractor shall notify in writing all residents, tenants, and businesses directly affected by the construction work. Such notice shall provide the nature of the work, the approximate time for the completion of work, and any anticipated inconveniences. The notice shall be on the contracting firm's letterhead and shall be signed and shall include the project superintendent's name and telephone number. Prior to commencing work in each given area, the Contractor shall furnish the Engineer a copy of the notice to be given to residents, tenants, and businesses for approval. After the notice is accepted by the Engineer the Contractor shall distribute and certify the date, location and method by which the notice was delivered. The Contractor shall also comply with the requirements of Section 12-2, "Traffic Control Plan; Notifications."

For every occurrence when property access, sewer service or water source is to be interrupted by the Contractor's work, the Contractor shall give written notice to all affected residents, tenants, and businesses not less than two (2) calendar days nor more than five (5) calendar days prior to said interruption. The notice(s) shall be in addition to the initial notice to residents, tenants, and businesses described above. In addition the Contractor will be responsible for informing and coordinating the timing of the interruption with the affected residents, tenants, and businesses. Where a significant interruption will occur, as determined by the Engineer, the Contractor will be required to coordinate with residents at a date earlier than listed in this Section 8-7.

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

8-8 Time of Completion

The Contractor shall complete all or any designated portion of the work called for under the contract in all parts and requirements within the time set forth in the Special Provisions. The current controlling operation or operations (i.e., the critical path) is to be construed to include any feature of the work (e.g., an operation or activity, or a settlement or curing period) considered at the time by the Engineer and the Contractor, which, if delayed or prolonged, will delay the time of completion of the contract.

For contracts whose completion schedule is based on working days, a working day is defined as any day, except as follows:

Saturdays, Sundays and legal holidays declared by the City;

Days on which the Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with at least 75 percent of the normal labor and equipment force engaged on that operation or operations for at least 50 percent of the total daily time being currently spent on the controlling operation or operations; or

Days on which the Contractor is prevented, by reason of requirements in the Contract Specifications, from working on the controlling operation or operations for at least 50 percent of the total daily time being currently spent on the controlling operation or operations.

Should the Contractor prepare to begin work at the regular starting time of any day on which inclement weather, or the conditions resulting from the weather, or the condition of the work, prevents the work from beginning at the usual starting time and the crew is dismissed as a result thereof and the Contractor does not proceed with at least 75 percent of the normal labor and equipment force engaged in the current controlling operation or operations for at least 50 percent of the total daily time being currently spent on the controlling operation or operations, the Contractor will not be charged for a working day whether or not conditions should change thereafter during that day and the major portion of the day could be considered to be suitable for those construction operations.

Determination that a day is a non working day by reason of inclement weather or conditions resulting immediately therefrom, shall be made by the Engineer. The Contractor will be allowed fifteen (15) working days from the issuance of this determination in which to file a written protest setting forth in what respects the Contractor differs from the Engineer; otherwise, the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. For Federally funded projects the Engineer will furnish the Contractor a weekly statement (or by other method that accomplishes the same purpose) showing the number of working days charged to the contract for the preceding period, the number of working days of time extensions being considered or approved, the number of working days originally specified for the completion of the contract and the number of working days remaining to complete the contract and the extended date for completion thereof, except when working days are not being charged in conformance with the provisions in Section 8-11, "Temporary Suspension of Work," of these Specifications. The weekly statement may be furnished to the Contractor for other projects that are not Federally funded when deemed appropriate or required by the Engineer.

For contracts whose completion schedule is based on calendar days, a calendar day shall mean every day of the calendar, including weekends and holidays. Exclusions for inclement weather which prevents the Contractor from performing, as above provided for working days will be permitted unless otherwise specified in the Construction Specifications.

8-9 Liquidated Damages

It is agreed by the parties to the Contract that in case all the Work called for under the Contract is not complete before or upon expiration of the time limit as set forth in the Contract Documents, damage will be sustained by the City. Since it is and will be impractical to determine the actual damage which the City will sustain in the event of and by reason of such delay, and since the delay will cause incalculable inconvenience to the public, it is therefor agreed that the Contractor will pay to the City the sum indicated in the Special Provisions for each and every calendar day's delay beyond the time prescribed to complete the Work; and the Contractor agrees to pay such sum as set forth in the Special Provisions, and in case the same is not paid, agrees that the City may deduct the amount thereof from any money due or that may become due the Contractor under the Contract. Liquidated damages will accrue without notice, and any failure by City to withhold for some or all of them shall not act as a waiver by City of its rights to later

claim the liquidated damages. Any waiver of liquidated damages by the City must be expressed and in writing.

It is further agreed that in case the Work is not finished and completed in all parts and requirements within the specified time, the City shall have the right to extend or not to extend the time for completion as may seem best to serve the interest of the City. If the City decides to extend the time limit for the completion of the Contract, the City shall further have the right to charge to the Contractor, his heirs, assigns, or sureties, and to deduct from the final payment for the work all or any part, as the City may deem proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the Contract, and which accrue during the period of such extension, except that the cost of final surveys and preparation of the final estimate shall not be included in such charges.

The Contractor shall not be assessed with liquidated damages, or the cost of engineering and inspection, during any delay in the completion of the work caused by acts of God or acts of the public enemy, the City, fire, epidemics, quarantine restrictions, strikes and freight embargoes, provided that the Contractor shall, within five (5) calendar days from the beginning of such delay, notify the Engineer in writing of the causes of delay; and the Engineer's finding of the facts thereon shall be final and conclusive.

No extension of time will be granted for a delay caused by a shortage of materials unless the Contractor furnishes to the Engineer documentary proof that the Contractor has made every effort to obtain the materials from all known sources within reasonable reach of the work in a diligent and timely manner, and further proof in the form of supplementary progress schedules, as required in Section 8-5 “Construction Schedule,” that the inability to obtain the materials when originally planned, did in fact cause a delay in final completion of the entire work which could not be compensated for by revising the sequence of the Contractor's operations. The term "shortage of materials," as used in this Section 8-9, shall apply only to materials, articles, parts or equipment which are standard items and are to be incorporated in the work. The term "shortage of materials," shall not apply to materials, parts, articles or equipment which are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the contract. Only the physical shortage of material will be considered under these provisions as a cause for extension of time. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials.

If the Contractor is delayed by the City in completion of the Work by reason of changes made under Section 4-10, “Changes,” by failure of the City to acquire or clear right of way, by Extra Work under Section 4-11, “Extra Work,” or by any act of the Engineer or of the City, not contemplated by the contract, an extension of time commensurate with the delay in completion of the work thus caused will be granted, provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of the delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive. In addition see Section 8-10, “Right of Way Delays” and Section 8-15, “Utility and Non-Street Facilities; Potholing” for additional circumstances involving an extension of time.

8-10 Right of Way Delays

The City makes a diligent effort at securing a clear right of way for the performance of the work required by the contract. For some contracts, it is in the best interests of the City and/or the public to award a contract before all utility relocations, utility undergrounding, right of way purchases, removal of obstructions, relocation of underground facilities by others, or other potential causes of delay are removed. Where known, these will be shown on the Plans with the actions to be taken, and enumerated in the Contract Documents. The City will make every effort to ascertain the approximate time required to

clear the right of way and so indicate in the Contract Specifications. The contractor shall include in his costs any delays that can be expected or result from such relocations or acquisitions. The Engineer may grant a time extension deemed warranted due to such delays, or may temporarily suspend the contract in accordance with Section 8-11, “Temporary Suspension of Work.”

If new and unforeseen right of way delays not contemplated before the award of the contract causes the Contractor to sustain a loss there shall be paid to the contractor that amount that the Engineer may find to be a fair and reasonable compensation for that part of the Contractor’s actual loss that, in the opinion of the Engineer, was unavoidable. Payment will be determined on the basis of extra work on a force account basis, or as otherwise agreed to by and between the Engineer and the Contractor, in accordance with Section 4-11, “Extra Work” and Section 9-5 “Payment for Extra Work.”

8-11 Temporary Suspension of Work

The Engineer shall have the authority to suspend the Work wholly or in part for such period as City desires. The Contractor shall immediately obey such order of the Engineer to suspend the Work, and shall not resume the Work until ordered in writing by the Engineer.

In the event that a suspension of Work is ordered as provided above, and should that suspension be ordered by reason of the failure of the Contractor to carry out orders or to perform any provision of the contract; or by reason of weather conditions being unsuitable for performing any item or items of Work, which Work, in the sole opinion of the Engineer, could have been performed prior to the occurrence of the unsuitable weather conditions had the Contractor diligently prosecuted the Work when weather conditions were suitable; then Contractor shall not be entitled to compensation (money or time) for the suspension, and the Contractor, at the Contractor's expense, shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by traffic during the period of that suspension as provided in Sections 7-17, "Public Convenience," and 7-18, "Public Safety," and as specified in the Contract Documents. In the event that the Contractor fails to perform the Work above specified, the City may perform that Work and the cost thereof will be deducted from moneys due or to become due the Contractor.

In the event that a suspension of Work is ordered by the Engineer due to unsuitable weather conditions, and in the sole opinion of the Engineer, the Contractor has prosecuted the Work with energy and diligence prior to the time that operations were suspended, the cost of providing a smooth and unobstructed passageway through the Work will be paid for as Extra Work as provided in Section 4-11, “Extra Work,” or at the option of the Engineer, that Work will be performed by the City at no cost to the Contractor. If the Engineer orders a suspension of all of the Work or a portion of the Work which is the current controlling operation (i.e., critical path) due to unsuitable weather conditions, and in the sole opinion of the Engineer, the Contractor has prosecuted the Work with energy and diligence prior to the time that operations were suspended, then Contractor shall be entitled to a time extension for the period of the suspension. If the portion of Work suspended is not a current controlling operation or operations, but subsequently does become the current controlling operation or operations, the determination of time extension will be made on the basis of the then current controlling operation or operations.

If a suspension of Work is ordered by the Engineer, due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the contract, the days on which the suspension order is in effect shall be considered for time extension only if permitted under Section 8-8, "Time of Completion."

8-12 Use of Completed Portions; City's Right to Complete

The City shall have the right to take possession of, use, or maintain and protect any completed portions of the Work. However, such possession, use, or maintenance and protection shall not be deemed as accepting any Work, regardless of whether it has or has not been completed in accordance with the Contract Documents.

The City has the right to perform some or all of the Contractor's remaining Work if the Contractor fails or refuses to carry out the Work in accordance with the Contract Documents. The City may exercise this right at any time during the Contractor's work, including the closeout or punch list phases. The City shall first provide written notice to Contractor of Contractor's failure or refusal to perform in accordance with the Contract Documents, and such notice shall demand commencement or correction of such failure or refusal to perform within a reasonable time not to be less than seven (7) days. Such notice need not specifically refer to this provision.

If the Contractor fails to commence correction within said reasonable time, or ever fails to continue correction after expiration of said reasonable time, the City may instruct Contractor to stop performing such Work and notify Contractor that City shall perform such Work itself. Any direction to Contractor to not perform such Work shall act as a deletion of such Work from Contractor's scope of Work, and City may accept the Contractor's remaining contractual scope of Work as complete (pursuant Section 8-14, "Acceptance of Contract") even though the deleted Work may not have been performed yet by City. City may perform the deleted Work at any time by whatever reasonable method the City may deem expedient without prejudice to other remedies the City may have. In the event the City takes bids to complete the Work so deleted, Contractor shall not be eligible for the award of the contract.

The Contractor will be invoiced for all of the City's costs of performing the deleted Work, including compensation for additional professional and internally generated services and expenses made necessary by such deletion. The City may withhold the estimated costs from any retention release and/or progress payments due the Contractor, pursuant to Section 9-9, "Stop Notices; City's Right to Withhold Payments." If retention and payments withheld then or thereafter due the Contractor are not sufficient to cover the City's actual costs of completing the deleted Work, the Contractor shall pay the difference to the City.

Prior to performing any of the deleted work itself, City may, at its option, tender completion of the work to the Contractor's surety for completion by someone other than Contractor.

8-13 Termination of Contract

If the Contractor files for bankruptcy; if the Contractor makes a general assignment for the benefit of his creditors; if a receiver should be appointed on account of the Contractor's insolvency; if the Contractor or any subcontractors should violate any of the provisions of the Contract; if the Contractor should refuse or should fail, except in cases for which extension of time is provided, to supply enough skilled workmen or proper materials; if the Contractor should fail to make prompt payment to subcontractors or for material or labor; or if the Contractor should disregard laws, ordinances or the instructions of the Engineer, the City may serve written notice upon the Contractor and its surety of the City's intention to terminate the Contract, such notice to contain the reasons for such intention to terminate the Contract and to provide five (5) calendar days for the Contractor to cure such violations and make satisfactory arrangements for correction thereof. In the case of filing for bankruptcy, the Contractor agrees that by entering this Contract it also stipulates that the bankruptcy court may grant relief to the City from any automatic stay as to this Contract (and as to any escrow agreement) so that City may proceed pursuant to this provision and terminate the contract if necessary. If within five (5) calendar days after the serving of the notice of intent

to terminate, such violations do not cease and satisfactory arrangements for correction thereof are not made, then the City may, at its discretion, terminate the Contract at any time thereafter.

In the event of any such termination, the City shall immediately serve written notice thereof upon the Contractor and its surety; and the surety shall have the right to take over and perform the Contract, provided, however, that if the surety within ten (10) calendar days after the serving upon it of notice of termination does not give City written notice of its intention to take over and perform the Contract or does not commence performance thereof within the ten (10) calendar days stated above from the date of the serving of such notice of termination, the City may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable, for the account and at the expense of the Contractor and its surety, and the Contractor and its surety shall be liable to the City for any excess cost incurred by the City. In such event the City may, without liability for so doing, take possession of and utilize in completing the work such materials, appliances, plant and other property belonging to the Contractor as may be on the site of the work and necessary therefor. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price shall exceed the expenses of finishing the work, including compensation for additional managerial and administration services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor and its surety shall pay the difference to the City. The expense incurred by the City, as herein provided and damage incurred through the Contractor's default, shall be certified by the Engineer.

The City may, at any time, terminate the Contract for the City's convenience and without cause. Upon receipt of written notice from the City of such termination for the City's convenience, the Contractor shall (1) cease operations as directed by the City in the notice; (2) take actions necessary, or that the City may direct, for the protection and preservation of the Work; and (3) except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders. The Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, but not overhead and profit on the Work not executed.

Any termination by City under this Section 8-13, or suspension by City under Section 8-11, "Temporary Suspension of the Work," shall not act as a waiver of any claims by City against Contractor or others for damages based on breach of contract, negligence or other grounds.

Contractor does not have the right to terminate the Contract or to suspend or slow down its performance of the Work. If Contractor believes that it is entitled to additional compensation (money and/or time) for any reason, or that it has been wronged for any reason, then it may submit a request for additional compensation and/or modification of the Contract; however, despite such requests as Contractor may make or disputes as may exist, Contractor shall continue to diligently prosecute the Work, and acceptably perform the Work, as required by the Contract through completion.

8-14 Acceptance of Contract

When the Engineer has made the final inspection as provided in Section 5-22, "Final Inspection," and determines that the Work has been fully performed, the Engineer will certify the Work as ready for Acceptance and recommend that the City Council formally accept the Work, and immediately upon and after the Acceptance of the Work by the City Council, the Contractor will be relieved of the duty of maintaining and protecting the work as a whole, except any landscape maintenance period required by the City of Visalia Landscape Standards and Specifications, and the Contractor will not be required to perform any further work thereon except for warranty work; and the Contractor shall be relieved of the responsibility for injury to persons or property or damage to the work which occurs after the formal

Acceptance by the City Council. Within ten (10) days of Acceptance by the City Council, the City shall record a Notice of Completion with the Tulare County recorder's office.

Acceptance of any Work shall not be deemed a waiver of the City's rights to remedy by the Contractor of (a) defective Work covered by warranty or guarantee for which the City gives timely notice to Contractor, and (b) latent defects resulting from defective materials or workmanship discovered after the City's recording of its Notice of Completion.

8-15 Utility and Non-Street Facilities; Potholing

Attention is directed to Sections 4-6, "Existing Facilities and Structures Shown on Plans," and 5-9, "Preservation of Property." The Contractor shall protect from damage utility and other non street facilities that are to remain in place, or to be installed, relocated or otherwise rearranged. As used in this Section 8-15, "non-street facilities" means any above or below ground facilities which are not a part of the roadway structural section, curb and gutter, and sidewalk. Utility shall include, but not be limited to, sewer, water, recycled water, storm drain, and irrigation pipelines, and above and below ground electrical and gas facilities, cable, telephone, or other utilities and communications facilities.

It is anticipated that some or all of the utility and other non street facilities, both above ground and below ground, that are required to be rearranged (as used herein, rearrangement includes installation, relocation, alteration or removal) as a part of the street improvement will be rearranged in advance of construction operations. Where it is not anticipated that the rearrangement will be performed prior to construction, or where the rearrangement must be coordinated with the Contractor's construction operations, the existing facilities that are to be rearranged will be indicated on the plans or in the Contract Documents. Where a rearrangement is indicated on the plans or in the Contract Documents, the Contractor will have no liability for the costs of performing the work involved in the rearrangement unless the Plans or Contract Documents indicate such rearrangement is to be performed by the Contractor.

The right is reserved to the City and the owners of facilities, or their authorized agents, to enter upon the street right of way for the purpose of making those changes that are necessary for the rearrangement of their facilities or for making necessary connections or repairs to their properties. In compliance with Section 5-15, "Cooperation," the Contractor shall cooperate with forces engaged in this work and shall conduct operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by the other forces. Wherever necessary, the work of the Contractor shall be coordinated with the rearrangement of utility or other non street facilities, and the Contractor shall make arrangements with the owner of those facilities for the coordination of the work.

The Contractor shall be aware of the possible existence of underground main or trunk line facilities not indicated on the Plans or in the Contract Specifications and to the possibility that underground main or trunk lines may be in a location different from that which is indicated on the Plans or in the Contract Specifications. Prior to commencing any trenching, excavation, or boring operations, or any work that may damage any of the facilities or interfere with their service, the Contractor shall, by potholing or other means approved by the Engineer, ascertain the exact location of underground main or trunk line facilities whose presence is indicated on the Plans or in the Contract Specifications or identified by their use or by USA, the location of their service laterals or other appurtenances, and of existing service lateral or appurtenances of any other underground facilities which can be inferred from the presence of visible facilities such as buildings, meters and junction boxes, vents, lids or manholes. Prior to construction the Contractor will be responsible for verifying that no conflicts exist between existing and proposed street and utility infrastructure improvements. Any additional expenses incurred because of the failure of the Contractor to comply with these requirements shall be borne by the Contractor.

Utility company service laterals are not shown on project plans. Contractor should allow for gas, water, sewer, telephone, and cable TV services for each lot shown. Utility companies will locate services and Contractor shall protect all services and facilities from injury. In case of damage to existing utilities, they shall be restored by the Contractor or by utility company personnel to the same type and quality of improvement at the Contractor's cost and expense without additional compensation.

If the Contractor cannot locate an underground facility whose presence is indicated on the Plans or in the Contract Specifications, the Contractor shall so notify the Engineer in writing. If the facility for which the notice is given is in a substantially different location from that indicated on the plans or in the Contract Documents and extra works is expended by the Contractor to locate the facility, the additional cost of locating the facility will be paid for as extra work as provided in Section 4-11, "Extra Work."

Nothing herein shall relieve the City from the duty of identifying main or trunklines in the plans or Contract Specifications pursuant to Government Code section 4215. If the Contractor discovers underground main or trunk lines not indicated on the plans or in the Contract Specifications, the Contractor shall immediately give the Engineer and the Utility Owner if not the City, written notification of the existence of those facilities. The main or trunk lines shall be located and protected from damage as directed by the Engineer, and the cost of that work will be paid for as extra work as provided in said Section 4-11. The Contractor shall, if directed by the Engineer, repair any damage which may occur to the main or trunk lines. Damage due to the Contractor's failure to exercise reasonable care shall be repaired at the Contractor's cost and expense.

Where it is determined by the Engineer that the rearrangement of an underground facility is essential in order to accommodate the street or underground improvement and the Plans and Specifications do not provide that the facility is to be rearranged, the Engineer will provide for the rearrangement of the facility by other forces or the rearrangement shall be performed by the Contractor and will be paid for as extra work as provided in said Section 4-11. Alternatively, the Engineer may direct the rearrangement of the street or underground improvement if movement of the underground facility is not essential.

Should the Contractor desire to have any rearrangement made in any utility facility, or other improvement, for the Contractor's convenience in order to facilitate the Contractor's construction operations, which rearrangement is in addition to, or different from, the rearrangements indicated on the Plans or in the Contract Specifications, the Contractor shall make whatever arrangements are necessary with the owners of the utility or other non-street facility for the rearrangement and bear all expenses in connection therewith.

The Contractor shall immediately notify the Engineer of any delays to the Contractor's operations as a direct result of underground main or trunk line facilities which were not indicated on the Plans or in the Contract Specifications or were located in a position substantially different from that indicated on the Plans or in the Contract Specifications, or as a direct result of utility or other non highway facilities not being rearranged as herein provided (other than delays in connection with rearrangements made to facilitate the Contractor's construction operations or delays due to a strike or labor dispute). These delays will be considered right of way delays within the meaning of Section 8-10, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in said Section 8-10. The Contractor shall be entitled to no other compensation for that delay.

Any delays to the Contractor's operations as a direct result of utility or other non highway facilities not being rearranged as provided in this Section 8-15, due to a strike or labor dispute, will entitle the Contractor to an extension of time as provided in Section 8-9, "Liquidated Damages." The Contractor shall be entitled to no other compensation for that delay.

Potholes or other excavations performed to determine the location of Utility and Non-Street Facilities, and which potholes or excavations will remain outside the area to be excavated for improvements shown on the Plans or specified in the Contract Specifications, shall be backfilled, compacted, and the surface thereof restored in accordance with Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration." Exception: Potholes or other excavations in the street area of diameter (or equivalent dimension if non-circular), of 9 inches or less, or any other pothole or excavation because of depth, shape, or other cause determined by the Engineer not to be feasible to apply the methods of said Section 19-3, shall be backfilled in accordance with the Utility Pothole Backfill Detail of the Standard Plans in the following manner: the bottom 1 foot of the pothole or other excavation shall be backfilled with clean sand; the remainder of the pothole or other excavation shall be backfilled with slurry cement conforming to Section 19-3.3C, "Slurry Cement Backfill," of the Specifications or with Class 2 Aggregate Base (AB) compacted in accordance with Section 19-3. In asphalt pavement street areas the pothole shall be resurfaced with a 7 inch thick hot mix asphalt plug with the surface level with or slightly higher than the surrounding existing pavement. The type of surface restoration for potholes outside of the street area shall be directed by the Engineer.

All costs for compliance with this Section 8-15 shall be included in the various bid items of work; no additional payment will be made therefor.

SECTION 9 MEASUREMENT AND PAYMENT

9-1 Measurement of Quantities

A. Units of Measurement

All work to be paid for at a contract price per unit of measurement will be measured by the Engineer in accordance with the U.S. Customary Units of Measurement. A ton shall consist of 2,000 pounds avoirdupois.

B. Quantities

Quantities of work shall be determined from measurements or dimensions in horizontal planes. However, linear quantities of pipe, piling, fencing, and timber shall be considered as being the true length measured along the longitudinal axis.

C. Volumetric Quantities

Volumetric quantities will be determined by the Engineer, and shall be the product of the mean area or vertical or horizontal sections and the intervening horizontal or vertical dimension.

When payment is to be made on the basis of weight, the weighing shall be done on scales furnished by and at the expense of the Contractor, or on other sealed scales regularly inspected by the State of California, Department of Food & Agriculture, Division of Measurements & Standards, or its designated representative. All scales shall be suitable for the purpose intended and shall conform to the Specifications of the State of California, Department of Food & Agriculture, Division of Measurements & Standards. The scales shall be operated by a weigh-master licensed in accordance with the provisions of the California Business and Professions Code. The Contractor shall furnish a Public Weighmaster's certificate, or a Private Weigh-master's certificate of certified daily summary weight sheets. The operator of each vehicle shall obtain a weight or load slip from the weigher and deliver said slip to the Engineer or Inspector at the point of delivery of the material.

Other materials and items of work which are to be paid for on the basis of measurement shall be measured in accordance with the methods stipulated in these Specifications, or the Contract Specifications for the particular items involved.

Full compensation for all expense involved in conforming to the requirements specified for measuring and weighing materials shall be considered as included in the unit price paid for the materials being measured or weighed; no additional compensation will be allowed therefor.

9-2 Cost Breakdown

The Contractor shall submit in a form acceptable to the Engineer, a schedule showing the subdivision of his contract into its various parts, stating quantities and prices for each item, to be made a basis for checking or computing monthly estimates, if such payments are specified. The schedule submitted shall be formatted to match the schedule, item numbers, and quantities in the Contract schedule. The prices shall include all costs of each item and payments for each item will be made on the basis of the unit related to that item. No payment will be made to the Contractor until such schedule has been submitted to and approved by the Engineer. The schedule of values shall be balanced and shall not shift excessive portions of the contract price into any particular part of the Work, especially parts of the Work being performed earlier in the schedule. No partial payment will be made to the Contractor until such schedule has been submitted to and approved by the Engineer. All cost breakdowns for progress payments shall include only that work that has been installed and completed up to the date shown on the Contractor's invoice.

Upon request of the Engineer, the Contractor shall provide a schedule showing the subdivision of any bid item or other work performed as part of the contract.

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

9-3 Final Pay Items

When an item of work is designated as (F) in the Engineer's Estimate, or is otherwise indicated in the Contract Specifications as a Final Pay Item, the estimated quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion of the item are revised, and the revisions result in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions. If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

The estimated quantity for each item of work designated as (F) or indicated otherwise as a final pay item in the Engineer's Estimate/Bid Proposal shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No allowance will be made in the event that the quantity based on computations does not equal the estimated quantity. For a Final Pay Item, the Contractor shall accept payment based on the Bid Item List quantity, regardless of actual quantity used unless dimensions are changed by the Engineer.

In case of discrepancy between the quantities shown in the Engineer's Estimate for a final pay item and the quantity or summation of quantities for the same item shown on the Plans, payment will be based on the quantity shown in the Engineer's Estimate.

9-4 Scope of Payment

The Contractor shall accept the compensation provided in the Contract as full payment for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the Work, for performing all Work contemplated and embraced under the Contract; also for loss or damage arising from the nature of the Work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the Work until the acceptance by the City and for all risks of every description connected with the prosecution of the Work; also for the expenses incurred in consequence of the suspension or discontinuance of the Work as provided in the Contract; and for completing the Work according to the Plans and Contract Documents. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of the obligation to make good any defective work or material.

No compensation will be made in any case for loss of anticipated profits.

The lump sums and/or unit prices shown in the bid proposal shall include full compensation for all Work and expenses appurtenant to the accomplishment of the project described in these Contract Documents in the manner indicated herein, including all items delineated in the Contract Documents for which specific bid items are not set up in the bid proposal. The Contractor shall proportionally spread all incidental costs associated with the work for which there are no separate bid items into the amount bid for those items of work for which there are bid items, and no separate or additional payment will be made for any requirement of the Contract not specifically listed on the bid proposal.

9-5 Payment for Extra Work

Extra Work as defined in Section 4-11, "Extra Work," when ordered and accepted, shall be paid for under a written Contract Change Order in accordance with the terms therein provided. Payment for Extra Work will be made at the unit price or lump sum previously agreed upon by the Contractor and the City by written Change Order. When the Contractor and City cannot agree on the price to be paid for extra work the Contractor shall perform the work on a force account basis only after written approval is received by the Engineer to proceed with the work. No payment will be made to the Contractor for extra work that was completed prior to receiving written approval from the Engineer.

All documentation submitted for Change Order approval or that is performed on a force account basis shall include at a minimum the following information:

1. A detailed factual account of the events causing the extra work, including:
   - 1.1. Pertinent dates
   - 1.2. Locations
   - 1.3. Work items affected by change
2. An itemized cost breakdown. Segregate costs into the following categories:
   - 2.1. Labor, including:
     - 2.1.1. Individuals
     - 2.1.2. Classifications
     - 2.1.3. Regular and overtime hours worked
     - 2.1.4. Dates worked
   - 2.2. Materials, including:
     - 2.2.1. Invoices
     - 2.2.2. Purchase orders
     - 2.2.3. Location of materials either stored or incorporated into the work
     - 2.2.4. Dates materials were transported to the job site or incorporated into the work
   - 2.3. Equipment, including:
     - 2.3.1. Detailed descriptions, including make, model, and serial number and the Model and Code reference listed in the Caltrans Labor Surcharge and Equipment Rental Rates book in effect when the work was performed
     - 2.3.2. Hours of use
     - 2.3.3. Dates of use
     - 2.3.4. Equipment costs (hourly rates and total cost)
3. If a time adjustment is requested:
   - 3.1. Dates for the requested time.
   - 3.2. Reasons for a time adjustment.
   - 3.3. Contract documentation supporting the requested time adjustment.
4. Identification and copies of your documents and copies of communications supporting the extra work, including certified payrolls, bills, cancelled checks, job cost reports, payment records, and rental agreements

Extra work can be paid by force account with and without prevailing wages. For extra work paid on a force account basis on locally funded projects not subject to prevailing wages, the Contractor will be compensated for extra work as negotiated between the City of Visalia and the Contractor. For extra work paid on a force account basis on State and Federally funded projects subject to prevailing wages, the Contractor shall be compensated in accordance with the provisions of Section 9-1.04, "Force Account," of the State Standard Specifications. Any references therein to "State" or "Department" shall mean "City."

In general, the Contractor shall not be compensated more than the amount allowed under Section 9-1.04, "Force Account," of the State Standard Specifications unless there is some unique circumstance and the amount is approved by the City of Visalia Change Order Committee. This applies to all force account and agreed to lump sum or unit price change orders whether the project is subject to prevailing wages or not. For any situation where right of way delays or temporary suspensions of work occur and it is determined that the Contractor is due additional compensation, the delay factors listed in the current Department of Transportation Labor Surcharge and Equipment Rental Rates book shall be utilized to determine the compensation amount.

The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct costs of extra work paid for on a force account basis and the costs of other operations. The Contractor shall furnish the Engineer report sheets in duplicate for each day's extra work and extra work paid for by force account no later than the thirty (30) days following the performance of said work. The daily report sheets shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, subcontractor, or other forces. The daily report sheet shall provide names or identifications and classifications of workmen, the hourly rate of pay and hours worked, and also the size, type and identification number of equipment and hours operated.
Material charges shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily report sheets, if available. Said daily report sheets shall be signed by the Contractor or his authorized agent. After comparison with the Engineer's records, any necessary adjustments are to be made and agreed upon. When these reports are agreed upon, the final package will be submitted to the Change Order Committee for approval. Payment as provided above shall constitute full compensation for the Contractor for performance of work paid for on a force account basis, and no additional compensation will be allowed therefore.

If the Contractor and the City cannot agree on the force account price to be paid for Extra Work, or if the Contractor and the City cannot agree that certain work is Extra Work, then the Contractor shall follow the claim and change order procedures of Sections 4-10, "Changes," and 4-12, "Notices, Change Orders, and Claims."

Payment as provided herein shall constitute full compensation to the Contractor for performance of Extra Work, and no additional compensation will be allowed therefor.

9-6 Partial ("Progress") Payments And Retentions

By the twentieth (20^{th}) day of each month, the Contractor shall, on forms approved by the Engineer, furnish the Contractor's estimate of work completed prior to that date based on the schedule of values submitted by the Contractor pursuant to Section 9-2, "Cost Breakdown." The estimate and application must include the Contractor's previous month's daily logs, updated monthly schedule, and material tickets/weigh-master certificates where payment is based on weight or the City has the right to reject it. For materials delivered to the site and which are eligible for partial payment, the amount of any material to be considered in making an estimate will in no case exceed the amount thereof which has been reported by the Contractor to the Engineer on forms approved by the Engineer properly filled out and executed, including accompanying documentation as therein required, less the amount of the material incorporated in the work to the time of the estimate. Only materials to be incorporated in the work will be considered. The estimated value of the material established by the Engineer will in no case exceed the contract price for the item of work for which the material is furnished. Payment requests submitted after the 20th day of the month will not be processed for payment in the following month, but will be processed for payment in the next succeeding monthly payment period, when such payment will become due and payable.

Where a Partial (Progress) payment is being made for a portion of a lump sum bid item the payment will be prorated and paid on the basis of the ratio of the total Contract amount ($) completed to date to the total original Contract amount.

The Engineer shall review, and revise if necessary, the Contractor's progress payment application. If the City determines that the application is not a proper payment request, the City should return it to Contractor as soon as practicable with an explanation of why it is not proper, but not later than fifteen (15) days after receipt. If the Contractor and City cannot agree on the amount of work performed or other aspects of the application, then the Contractor shall resubmit using the Engineer's version. (If the Contractor feels that it should be paid more, it may follow the claims process under Section 4-12, "Notices, Change Orders, and Claims.") The City should make the payment within thirty (30) days of the Contractor's submittal of an undisputed and properly submitted payment application. City shall require Contractor to complete a Conditional Waiver and Release On Progress Payment form prior to payment of a progress payment.

The City shall retain the stated retention amount for this project, normally this amount will be five (5) percent of the estimated value of the work done and five (5) percent of the value of materials so estimated to have been furnished and delivered and unused as part security for the fulfillment of the contract by the Contractor. This amount may be higher if the City has complied with Public Contract Code requirements and designated this project as substantially complex and required a higher retention amount. In those situations the City will withhold the retention amount designated in the Special Provisions. At the discretion of the Engineer, at any time after fifty (50) percent of the work has been completed, if the Engineer finds that satisfactory progress is being made, the City may reduce the amount retained from any of the remaining partial progress payments in accordance with Section 9203 of the State Public Contract Code.

The City shall pay monthly to the Contractor, while carrying on the Work, the balance not retained, as aforesaid, after deducting therefrom all previous payments and all sums to be kept or retained under the provisions of the Contract. No monthly estimate or payment shall be required to be made when, in the judgment of the Engineer, the Work is not proceeding in accordance with the provisions of the contract. No monthly estimate or payment shall be construed to be an acceptance of any defective work or improper materials. Attention is directed to the prohibitions and penalties pertaining to unlicensed contractors as provided in Business and Professions Code Sections 7028.15(a) and 7031.

9-7 Required Releases

The Contractor shall not be entitled to any payment specified in its Contract which is undisputed until such time as the Contractor has executed a release, in the following form, releasing the Owner from all claims relating to the work for which the Contractor is being paid. The release form contains space for the Contractor to claim any disputed amount and to designate the retention amount for each period associated with the release. Contractor hereby expressly agrees that failure on its part to designate any disputed amount or to designate the correct retention amount for each release period on the release form shall constitute an express waiver of the right of the Contractor to claim any disputed amount or any retention amount at any later date. The Owner shall have no obligation to pay the Contractor for any work done until the release form attached to these Contract Documents has been executed by the Contractor and submitted to the Owner.

CONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

PAYMENT NOTICE: THIS DOCUMENT WAIVES THE CONTRACTOR'S CLAIMS AGAINST THE CITY OF VISALIA FOR THE WORK PERFORMED IN THE IDENTIFIED PROJECT ON RECEIPT OF PAYMENT UNLESS LISTED AS AN EXCEPTION.

Owner: City of Visalia
Name of Contractor: _____
Project Description: _____
Period Work Performed: _____

Conditional Waiver and Release (Progress Payment)
This document waives and releases the Contractor's claims against the City of Visalia upon receipt of the progress payment for all labor and materials furnished and for all work performed on the above referenced project for the specified period except for the exceptions specified below.

Amount of Progress Payment: _____

Exceptions
This waiver and release does not affect any items described below. If the item does not apply, then it should be left blank. Attach additional pages if needed.

1. Retentions - Retention Amount this Period _____

2. Extra Work for which the Contractor has not received payment:
   _____
   _____
   _____
   _____

3. The following progress payments for which the Contractor has previously provided the City of Visalia with a conditional waiver and release but has not received payment:
   _____

4. Contract rights including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment, summarize any such exception below :
   _____
   _____

Signature
The Contractor expressly waives and releases any claim the Contractor may have arising out of the project described above for the period specified above upon receipt of the progress payment, unless the claim is listed as an exception. This release and waiver has been made voluntarily by the Contractor without any fraud, duress, or undue influence by any person or entity.

Contractor further certifies, warrants, and represents that all bills for labor, materials, and work due subcontractors for the specified period have been paid in full and that the parties signing below on behalf of the Contractor have express authority to execute this waiver and release.

_____ _____
Signature Date

_____
Print Name

9-8 Prompt Progress Payments Due to Subcontractors.

A prime contractor or subcontractor shall pay any subcontractor not later than ten (10) days of receipts of each progress payment in accordance with the provision in Section 7108.5 of the California Business and Professions Code concerning prompt payment to subcontractors. The ten (10) days is applicable unless a longer period is agreed to in writing. Any delay or postponement of payment over thirty (30) days may take place only for good cause and with the agency's prior written approval. Any violation of Section 7108.5 shall subject the violating contractor or subcontractor to the penalties, sanctions and other remedies of that section. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the prime contractor, deficient subcontract performance, or noncompliance by a subcontractor.

The agency shall hold retainage from the prime contractor and shall make prompt and regular incremental acceptances of portions, as determined by the agency, of the contract work and pay retainage to the prime contractor based on these acceptances. The prime contractor or subcontractor shall return all monies withheld in retention from a subcontractor within thirty (30) days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract work by the agency. Federal law (49 CFR26.29) requires that any delay or postponement of payment over thirty (30) days may take place only for good cause and with the agency's prior written approval. Any violation of this provision shall subject the violating prime contractor or subcontractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the Business and Professions Code. These requirements shall not be construed to limit or impair any contractual, administrative or judicial remedies otherwise available to the prime contractor or subcontractor, in the event of a dispute involving late payment or non payment by the prime contractor, deficient subcontract performance or noncompliance by a subcontractor.

9-9 Stop Notices; City's Right to Withhold Payments

In addition to the retention amount withheld pursuant to Section 9-6, "Partial ('Progress') Payments and Retentions," the City may withhold or nullify the whole or any part of any partial or final progress payment or any release of retention, to such extent as may reasonably be necessary to protect the City from loss on account of:

A. Defective work not remedied, irrespective of when any such work be defective;

B. Failure of the Contractor to make proper payments for labor, material, equipment, other facilities, or to subcontractors;

C. Any penalties provided in these Contract Documents for failure of the Contractor to carry out specific orders of the Engineer.

D. Stop Notices pursuant to Civil Code sections 9350-9364, unless the Contractor at its sole expense provides a bond or other security satisfactory to the City in the amount of at least one hundred twenty-five percent (125%) of the claim, in a form satisfactory to the City, which protects the City against such claim. Any stop notice release bond shall be executed by a California admitted, fiscally solvent surety, completely unaffiliated with and separate from the surety on the payment and performance bonds, that does not have any assets pooled with the payment and performance bond sureties. The City may also withhold for the estimated reasonable cost of stop notice litigation to be incurred. For any stop notice resolved and/or released, the City may withhold for any reasonable cost of litigation actually incurred for that stop notice;

E. Liquidated damages against the Contractor, whether already accrued or estimated to accrue in the future;

F. Reasonable doubt that the Work can be completed for the unpaid balance of any Contract Sum or by the completion date;

G. Damage to the property or work of the City, another contractor, or subcontractor;

H. Unsatisfactory prosecution of the Work by the Contractor, and/or failure to perform all required Work;

I. Failure to store and properly secure materials;

J. Failure of the Contractor to submit on a timely basis, proper and sufficient documentation required by the Contract Documents, including, without limitation, monthly progress schedules, shop drawings, submittal schedules, schedule of values, product data and samples, proposed product lists, executed change orders, and verified reports;

K. Failure of the Contractor to maintain and submit record as-built drawings;

L. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;

M. Unauthorized deviations from the Contract Documents;

N. Failure of the Contractor to prosecute the Work in a timely manner in compliance with established progress schedules and completion dates;

O. Subsequently discovered evidence or observations nullifying the whole or part of a previously issued Change Order or Certificate for Payment;

P. Previous overpayment to Contractor;

Q. Credits owed to the City for reduced scope of work or work that the City otherwise permits Contractor to not perform, and such credits will be based on the reasonable bid value of the unperformed work, including markups for overhead and profit;

R. The estimated value of performing work deleted pursuant to Section 8-12, "Use of Completed Portions; City's Right to Complete;"

S. False claims by Contractor;

T. Breach of any provision of the Contract Documents;

U. Potential loss, liability or damages to the City that is potentially caused by the Contractor; and

V. As permitted by other provisions in the Contract.

The City shall provide written notice to Contractor of items for which the City is withholding from a payment at the time that the payment is being processed. To claim wrongful withholding by the City, or if Contractor otherwise disputes any amount being withheld, Contractor must follow the claim procedures of Section 4-12, "Notices, Change Orders, and Claims." Upon request of the Contractor from whose payment or release the City withheld funds, the Contractor shall be given a written copy of the City's reasons for withholding. When the grounds for withholding funds are removed, payment or release shall be made for amounts withheld because of them. No interest shall be paid on any amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

In addition to withholding amounts permitted by the Contract and statutes (including but not limited to Public Contract Code section 7107), the City may withhold an additional 50% contingency from any progress payment or retention release for any unknown, uncertain or estimated withhold amount. Once the withhold amount becomes known and certain, then the City shall continue to withhold the known and

certain amount and credit, pay or release the remainder, if any, to Contractor. If the known and certain amount exceeds the amount previously withheld, then the City may withhold more from Contractor to cover the excess amount, if unpaid contract funds or retention funds are available for withholding.

The City's withholdings of any unpaid or unreleased amounts for costs, damages and claims against the Contractor shall take priority over any third party claims against the unpaid or unreleased amounts, including stop notices.

Any overpayment to the Contractor by the City, and any failure to withhold an amount from payment that the City had the right to withhold, shall not constitute a waiver by the City of its rights to withhold for such amounts from future payments to the Contractor or to otherwise pursue those amounts from the Contractor.

For any stop notice enforcement action against the City filed by any of the Contractor's subcontractors or suppliers of any tier, the Contractor shall defend and indemnify the City, and its officers, agents and employees, against any and all liability, loss, and damages.

9-10 Payment of Withheld Funds (Substitutions for retention)

Reference is made to the retention provisions of Section 9-6, "Partial (Progress) Payments and Retentions." Upon the Contractor's request, pursuant to Public Contract Code Section 22300, the City will make payment of funds withheld from progress payments to ensure performance of the contract if the Contractor deposits in escrow with the City or with a bank acceptable to the City, securities equivalent to the amount withheld. The Contractor shall be beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon. Upon satisfactory completion of the Contract, the securities shall be returned to the Contractor.

Alternatively, upon the Contractor's request, the City will make payment of retentions earned directly to an escrow agent. The Contractor may direct the investment of the payments into securities, and the Contractor shall receive the interest earned on the investments upon the same terms provided for securities deposited by the Contractor. Upon satisfactory completion of the contract, the Contractor shall receive from the escrow agent all securities, interest and payments received by the escrow agent from the City, pursuant to the terms in Section 22300 of the Public Contract Code.

Securities eligible for investment shall include those listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit or any other security mutually agreed to by the Contractor and the City.

The escrow agreement used pursuant to this Section 9-10 shall be substantially similar to the "Escrow Agreement for Security Deposits In Lieu of Retention" in Section 22300 of the Public Contract Code, deemed as incorporated herein by reference. The Contractor shall obtain the written consent of the surety to the agreement.

Any of the alternatives to the retentions normally withheld by the City are subject to the provisions of Section 9-9, "Stop Notices; City's Right To Withhold Payments," and to the approval of the City Finance Director.

9-11 Notice of Potential Claim

In the event that a dispute over the conduct or payment of any portion of the Work was not resolved by issuance of a contract change order or other agreement between the Contractor and the Engineer, and it is the intent of the Contractor to submit a formal claim to resolve the matter, the Contractor shall file with

the Engineer a written notice of such intent pursuant to Section 4-12, "Notices, Change Orders, and Claims."

9-12 Final Progress Payment

Provided no notices of potential claim, proposed change orders, or claims are pending under Section 4-12, "Notices, Change Orders, and Claims," the Engineer shall, after the completion of the Contract, make a final estimate of the amount of work done thereunder and the value of such work; and the City shall pay the entire sum so found to be due after deducting the retention amount from the final estimate, or other amounts as provided in Section 9-6, "Partial (Progress) Payments and Retentions" and Section 9-9, "Stop Notices; City's Right To Withhold Payments," to be retained following completion of the work.

If a notice of potential claim, proposed change order, or claim is pending under Section 4-12, "Notices, Change Orders, and Claims," and is not resolved in time necessary for the processing of the final monthly progress payment as provided in the above paragraph, the Engineer shall cause a semi-final estimate to be prepared, and the Contractor shall be paid any amounts due less any retentions as provided in Section 9-6, "Partial (`Progress') Payments and Retentions, " and Section 9-9, "Stop Notices; City's Right to Withhold Payments." Upon resolution of the procedures under said Section 4-12, a final estimate will be prepared as above provided, and a final progress payment shall be made.

9-13 Final Payment to Release Owner

The acceptance, without notice of potential claim, by the Contractor of the final payment shall be and shall operate as a release to the Owner (City) of all claims and all liability to the Contractor for all things done or performed for or relating to the work and for every act and neglect of the City and others relating to or arising out of the work, excepting only the Contractor's claims, if any, for amounts withheld by the City, upon final payment. However, no payment, final or otherwise, shall operate to release the Contractor or his sureties from any obligation upon or under this Contract or the Contractor's bond.

9-14 Payment of Retention

Retention shall be released at the latest sixty (60) days after the occurrence of any of the definitions of "Completion" for purposes of Public Contract Code Section 7107 (see definitions of "Completion" in Section 1-3.17B). Any final payment and release of retentions will exclude any amounts withheld in conformance with Section 9-9, "Stop Notices; Rights of the City to Withhold Payments," and Public Contract Code section 7107. When specified in the Contract Specifications, certain portions of the amount retained pursuant to Section 9-6, "Partial ('Progress') Payments and Retentions," may be withheld until the satisfactory completion of the maintenance period specified in the City of Visalia Landscape Standards and Specifications for work pertaining to the installation of landscaping and irrigation facilities.

SECTION 10 DUST CONTROL

10-1 Dust Control

This work shall consist of maintaining dust control about the site of the work, including any haul roads to or from the site, by whatever means are necessary, such as watering, vacuuming, sweeping or oiling, so as to cause the least possible dust nuisance to the public. Any dust control measure ordered by the Engineer shall be promptly and immediately carried out. The requirements of Section 7, "Legal Relations and Responsibilities," as it relates to air pollution, water pollution, public convenience, and public safety shall be adhered to as a part of providing Dust Control. The Contractor is responsible for maintaining dust control continuously throughout the duration of the construction project including weekends and holidays, 7 days a week, 24 hours a day.

The Contractor shall make arrangements for and shall acquire and pay all costs for a satisfactory water supply in accordance with Section 5-13, "Electrical and Water Service." The Contractor shall furnish equipment for transporting and applying water for dust control. The equipment shall meet the approval of the Engineer.

The Contractor shall comply with all the requirements of Section 7-6, "Air Pollution Control," and all of the regulations/requirements of the San Joaquin Valley Air Pollution Control District, hereinafter to be referred to as APCD or Air District, as a part of providing Dust Control.

Dust control shall conform to the provisions of this Section and to the adopted rules from the San Joaquin Valley Air Pollution Control District, Regulation VIII to limit fugitive dust emissions from construction, demolition, excavation, and related activities. A copy of the rules and requirements of SJVAPCD Regulation VIII can be obtained at the following website:
http://www.valleyair.org/busind/comply/PM10/compliance_PM10.htm

The Contractor is required to submit a Dust Control Plan and application to the San Joaquin Valley Air Pollution Control District to obtain a District-approved Dust Control Plan at least 30 days prior to the start of construction activity if more than 2,500 CY of materials per day will be moved on at least three days of the project or if the project disturbs a surface area of more than 5 acres (non-residential projects). See the Regulation VIII requirements for residential projects. If a dust control plan is not required for the project, the Contractor shall still be required to file a Construction Notification Form with the SJVAPCD at least 48 hours prior to commencing any earthmoving activities. The Contractor will be responsible for providing the City of Visalia two (2) hard copies of all notification forms and correspondence between the Air District and the Contractor.

Prior to the Contractor submitting a Dust Control Plan and application to the Air District, he shall submit two (2) hard copies of the completed Dust Control Plan and application to the City of Visalia for review and approval. Upon approval by the City, the Contractor shall submit the required documents to the Air District for approval. After the Dust Control Plan and application are approved by the Air District, the Contractor shall provide to the City of Visalia two (2) hard copies of the approved Dust Control Plans, applications, and Air District approval letter prior to the start of construction.

During all phases of the construction and until completion of the project, the Contractor shall keep the work site clean and free from rubbish and debris. The Contractor shall also control dust by sweeping, vacuuming, sprinkling with water, applying dust palliative, or other approved methods. Water for use in dust control will be available from the California Water Service Company fire hydrants. Prior to the use of such water, the Contractor shall obtain a permit and meter from the California Water Service Company. A specific hydrant shall be designated by the California Water Service Company for use by the

Contractor. Contractor shall be responsible for all fees to the California Water Service Company, related to fire hydrant use. If City Municipal Codes are violated the Contractor may be subject a code enforcement action and separate penalty under those provisions, including fines, and penalties. In addition, City personnel or equipment may be used to control the dust at the cost of Contractor, or as per the Municipal Code the City may charge the Contractor double the cost as a penalty.

10-2 Payment

Payment for Dust Control shall include the cost for all labor, materials, and equipment, including the cost of all water used in the performance of the work, necessary to provide dust control and to comply with all regulatory agencies' requirements and this section including completing permits and paying fees. Where the Contract includes a lump sum bid item for Dust Control, full compensation for dust control shall be included in the lump sum price bid therefor. Payment will be prorated on the basis of the ratio of the total Contract amount ($) completed to date to the total original Contract amount less the sum of dust control and any other prorated items.

Where no bid item is provided for Dust Control, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

SECTION 11 MOBILIZATION & DEMOBILIZATION

11-1 Description

Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, buildings, staging yards, and other facilities necessary for the work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site, including, but not limited to permits and bond premiums and insurance premiums.

Demobilization shall consist of all closing work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals off the project site, and all other work and operations which must be performed to complete the project, including clean-up.

11-2 Payment

The contract lump sum price paid for Mobilization & Demobilization shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in this Section 11.

Where no bid item is provided for Mobilization & Demobilization, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

SECTION 12 TRAFFIC CONTROL; CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

12-1 General

This work shall consist of providing for the convenience and safety of traffic and pedestrians in connection with the Contractor's operations. Traffic and pedestrian control shall be furnished, provided and maintained in accordance with this Section 12, by the Contractor at all times throughout the life of the Contract/Construction Project including weekends and holidays, 7 days a week, 24 hours a day. All traffic control devices used in the performance of traffic control shall conform to the requirements of Section 12-2, "Traffic Control", and Section 12-3, "Construction Area Traffic Control Devices." The Contractor shall comply with the provisions of Section 7-17, "Public Convenience," and Section 7-18, "Public Safety." These requirements work in conjunction with the City of Visalia Encroachment Permit Policy Manual. The Contractor will be required to comply with all of the requirements of the current edition of the Encroachment Permit Policy Manual in affect at the time of construction.

12-2 Traffic Control

12-2.1 Traffic Control Plan, Notifications, Portable Changeable Message Signs (PCMS), Construction Notification Signs

A. Traffic Control Plan

Unless otherwise specified in Construction Specifications, a traffic and pedestrian control plan shall be submitted to the City at the preconstruction meeting or 5 days thereafter for Public projects. In the case of a Non-Public project the Contractor shall submit a traffic control plan (TCP) and full Encroachment Permit application for approval a minimum of ten (10) working days prior to the beginning of construction. The Contractor shall have an Encroachment Permit with effective dates prior to the beginning of construction. If any part of the traffic/pedestrian control plan falls within 300 feet of a signalized intersection, an off-duty officer may be required for traffic control at discretion of the City Engineer. Traffic control plans shall be drawn to a size and scale to show clearly all the necessary details. The traffic control plan shall be prepared by a Civil or Traffic Engineer registered by the State of California or an IMSA or ATSSA certified designer. The Traffic Control Plan shall conform to the requirements of this Section 12, "Traffic Control; Construction Area Traffic Control Devices," and Part 6 of the California MUTCD. Where road closures are anticipated or required, the Contractor shall comply with Section 4-14, "Detours," and Section 12-2.4, "Road Closures," for special plan preparation requirements. An accepted TCP will be stamped and a copy returned to the Contractor. A copy of the accepted plan must remain on the job site at all times.

The General Contractor shall be responsible for providing the Traffic Control Plan for all phases of the work, for all his subcontractors, and shall submit a new plan for approval whenever site conditions change from those originally anticipated resulting in different impacts to traffic and pedestrian travel/access. All costs for designing and obtaining an approved TCP and Encroachment Permit shall be included in the lump sum price bid for Traffic Control.

B. Notifications.

At least five (5) working days in advance of beginning work in any street, alley, or other public thoroughfare, the Contractor shall notify the Engineer, the City Police and Fire Departments, City Solid Waste and Transit Departments, all ambulance companies, Schools or School Districts and

any other jurisdictional agencies involved and comply with their requirements regarding traffic control and public convenience and safety.

In addition, the Contractor shall keep the City Fire Department, Police Department, Solid Waste Department, Transit Department, and ambulance companies informed at all times as to the exact location and progress of the work and shall notify them immediately of any streets closed to traffic or impassable for fire fighting or other safety equipment.

In accordance with Section 8-7, "Notice to Residents," residents, tenants and businesses along the work area shall be provided passage as far as practicable, as determined by the Engineer. Convenient access to driveways, houses and businesses along the road, street, alley or other work area shall be maintained; temporary trench crossings shall be provided and maintained in good condition as required to provide said access. All costs for providing all noticing specified herein shall be included in the lump sum price bid for Traffic Control.

C. Portable Changeable Message Signs

Portable Changeable Message Signs (PCMS) shall be installed on all Collector and Arterial streets where lane restrictions, lane closures or road closures will occur. Other streets may require PCMS as directed by the City of Visalia depending on the proposed phasing of work or field conditions. PCMS shall be installed prior to construction in advance of the project boundary on each approaching roadway indicating the start and end dates of construction as follows:

1. PCMS shall be installed a minimum of seven (7) days in advance of roadway lane restrictions and advance notice of a project.
2. PCMS shall be installed a minimum of fourteen (14) days in advance of roadway closures.
3. PCMS shall be installed as directed by the City Engineer.

All PCMS shall remain in place until construction starts. If construction activity stops for a period of greater than fourteen (14) days or if throughout the duration of construction project road closures are planned to occur PCMS shall be re-installed in advance of these construction activities according to the minimum advanced notice requirements of notes 1-3 of this section. The wording shown on the PCMS shall be as follows for the following situations:

Closure Situation:		
ROAD CLOSED AHEAD	BEGINNING DATE TO END DATE	USE POSTED DETOUR
Lane Restriction Situation:		
ROAD WORK AHEAD	BEGINNING DATE TO END DATE	EXPECT DELAYS
Commencing Work Situation:		
ROAD WORK STARTS	BEGINNING DATE TO END DATE	EXPECT DELAYS

The contractor shall be responsible for the placement of any PCMS and all other devices necessary as required by the California MUTCD to assure safety to the public at all times during construction. Each PCMS shall have the proper traffic control measures in advance of each location to alert motorists of a potential obstruction in the roadway. Traffic lanes or sidewalks shall not be obstructed by the PCMS unless approved by the City of Visalia. The Contractor shall check the PCMS daily to ensure they are functioning properly with the appropriate message. The contractor shall repair or replace any PCMS that is not functioning properly within four (4) hours of being notified.

The PCMS signs can be removed following the installation of the Construction Notification Sign when the PCMS are used to identify commencement of work or when the closure or restriction is occurring as the first construction activity. No additional payment will be made to Contractor for CMS signs required to remain due to Contractors failure to furnish and install the Construction Notification Signs. All costs for providing all PCMS as specified herein shall be included in the lump sum price bid for Portable Changeable Message Signs (PCMS).

D. Construction Notification Signs

Construction notification signs shall be installed at or near the locations of the PCMS or as required by the City Engineer, notifying the public of;

1. Project name, and
2. Project duration, and
3. Contractor's company name with contact telephone number.

Construction notification signs shall be installed as required by the Engineer. The sign's overall dimension shall not exceed 48 inches in height by 66 inches in width. The lettering size, sign materials, and related sign configuration is shown in Exhibit A. The contractor shall submit a drawing of the proposed sign showing the wording to be displayed and the size of the lettering prior to the fabricating of the signs. A map shall be included with the submittal showing the location of each construction notification sign.

The contractor is responsible for maintaining the sign for the duration of the project. The sign shall be mounted on posts and conform to the 2010 Standard Plans, pages RS-1 through RS-4, of the State of California Department of Transportation.

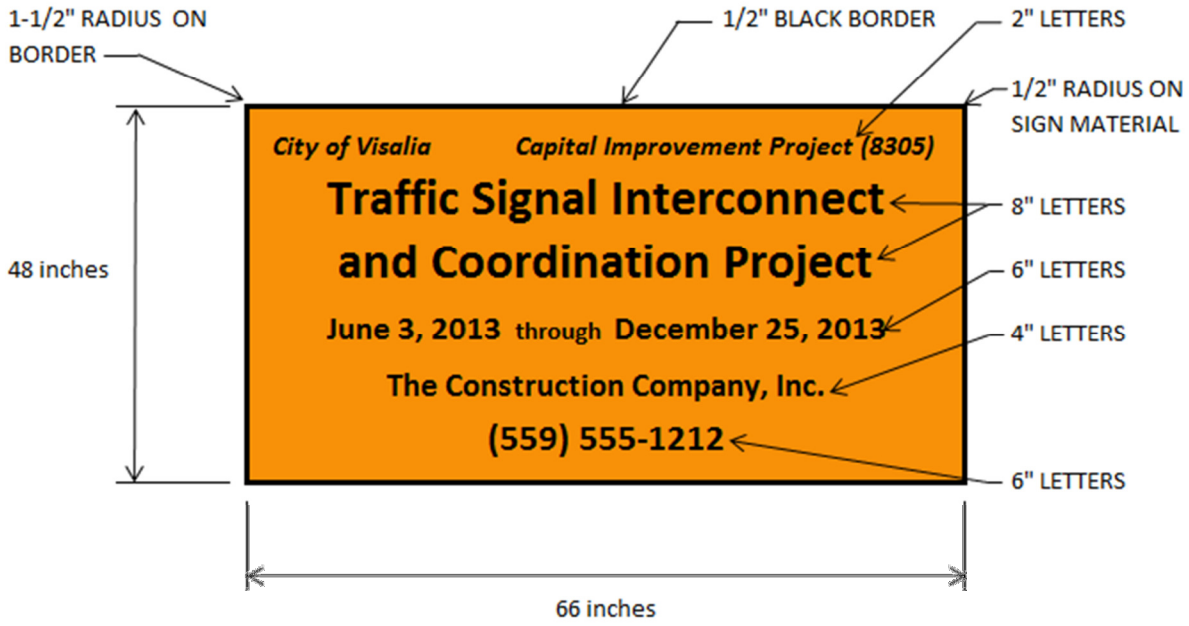
The construction notification signs shall be installed immediately following the removal of the PCMS. The construction notification signs shall be removed within five (5) days of the completion of the project.

If, any sign is damaged or in the opinion of the City needing to be repaired or replaced, the contractor shall repair or replace the sign within twelve (12) hours of being notified. Full compensation for the repair or replacement of the construction notification sign(s) shall be considered as included in the contract price paid for the related item of work and no additional compensation will be allowed therefore.

All costs for providing all Construction Notification Signs as specified herein shall be included in the unit price bid per each for Construction Notification Signs.

Exhibit A – Example Construction Notification Sign

CONSTRUCTION NOTIFICATION SIGN DETAIL



Notes:

1 Sign material shall be 0.08 inches minimum in thickness and shall be aluminim alloy #5052-H38.
2 All sheeting shall be 3M brand Diamond Grade 3 retroreflective material with anti-graffiti coating.
3 The sign shall have black border and legend with the background being orange.
4 The sign shall be mounted on two 4" by 4" wood posts. Each post shall have 3/4" holes drilled through each post at 3" and 6" above the ground line and parallel to the face of the sign.
5 The sign shall be orientated perpendicular to the direction of travel and facing the approaching traffic.

12-2.2 Contractor's Operations

The Contractor shall so conduct his operations as to cause the least possible obstruction and inconvenience to public traffic and abutting property owners (or tenants), and he shall have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights and safety of the public.

Unless other existing streets are specified in the Special Provisions to be used as detours, all traffic shall be permitted to pass through the work area. Two traffic lanes, one in each direction, through the work area shall be maintained. However, as an absolute minimum, one traffic lane shall be kept open with flagperson control, thus maintaining traffic flow. Single lane traffic control shall only be allowed where be approved by the Engineer in writing.

All lanes through the work area shall have a properly maintained all weather surface hereinafter referred to as Temporary Paving. The Temporary Paving shall consist of a minimum of 2" thick cold mix asphalt (cutback asphalt) pavement. Temporary paving in collector and arterial streets shall be replaced with final paving within twenty-one (21) days. Temporary paving in residential streets shall be replaced with final paving within forty-two (42) days. If a surface other than asphalt concrete is planned to be used, prior approval is required from the Engineer. This Temporary Pavement shall be maintained in a safe and reasonably smooth condition until the required final pavement replacement is completed. Temporary paving removed shall be hauled from the job site and disposed of at the Contractor's expense; no additional compensation will be provided therefor.

The Contractor shall provide such flagmen, and furnish, erect, and maintain such fences, barriers, lights, and signs as are necessary to give adequate warning to the public at all times throughout the duration of the contract that the road, street, or other work area is under construction and of any dangerous condition to be encountered as a result thereof. Traffic control conforming to Part 6 of the California MUTCD shall be maintained at all times in, through, and surrounding the construction site continuously throughout the duration of the project including weekends and holidays, 7 days a week, 24 hours a day. Compliance with the requirements of said manual shall be considered as a minimum requirement and the Contractor shall provide additional safety devices when necessary to maintain a safe condition. The Contractor may be required to cover certain signs which regulate or direct public traffic to roadways that are not open to traffic. The Engineer will determine which signs shall be covered.

Safe, adequate, continuous and unobstructed pedestrian and vehicular access shall be maintained to fire hydrants, residences, commercial and industrial establishments, etc., unless other arrangements satisfactory to the owners have been made. Safe and adequate pedestrian zones and public transportation stops, as well as pedestrian crossings of the work at intervals not exceeding 300 feet also shall be maintained unless otherwise approved by the Engineer.

Where public traffic and/or emergency vehicles must be routed over areas under construction, the contractor's operations shall be conducted in such a manner as to provide a smooth and stable roadway surface at all times when the specific area is not under actual construction. Dust control conforming to Section 10, "Dust Control," shall be provided at all times. Alternating traffic over work areas, use of one-way traffic control with flaggers, or any other methods used by the Contractor shall be approved by the Engineer and shall conform to Part 6 of the California MUTCD.

Construction Area Signs shall be picked up and removed from the street right of way at the end of each work day except where said signs are required to remain overnight to adequately warn the public for convenience or safety. Any signs that are permitted to remain overnight shall be turned and oriented in a manner that does not allow the sign to be read by the adjacent traffic. All signs, delineators, and other traffic control facilities left out overnight shall be retroreflective meeting the requirements of the California MUTCD. All traffic signs and barricades located in any part of the street right of way or pedestrian pathways (sidewalk) that are left out overnight shall have flashing yellow beacons installed on them that meet the specifications listed in the California MUTCD. Exception: Temporary traffic stop signs shall have flashing red beacons instead of yellow.

Contact the City Arborist at (559) 713-4295 prior to installing any construction area sign in any landscaped areas.

In situations where street paveouts are being constructed or other improvements are being constructed that leave a vertical drop along an edge of pavement in the roadway within 6 feet of a travel lane or designated bike path, the Contractor shall be responsible for installing a compacted and stable 4:1 (4 feet horizontal

to 1 foot vertical) fill slope from the existing pavement edge to the adjacent grade unless solid unmovable barricades or K-rails are installed to protect the public and isolate the area. At a minimum, this 4:1 slope shall be in place at the end of each work day and at any other time that work is not being performed at the site.

12-2.3 Flaggers

Flaggers while on duty and assigned to traffic control or to give warning to the public that the street or other area is under construction and of any dangerous conditions to be encountered as a result thereof, shall perform their duties and shall be provided with the necessary equipment in conformance with Part 6 of the California MUTCD. The equipment shall be furnished and kept clean and in good condition by the Contractor at the Contractor's expense. All flaggers shall have the proper training and shall meet the qualification requirements of Section 6E.01 "Qualifications for Flaggers" of the California MUTCD. At the request of the engineer, the Contractor shall be responsible for providing training documentation for each flagger on the jobsite prior to construction.

12-2.4 Road Closures

Where road closures and detours are required by the Contract Specifications or the plans, the Contractor shall implement such closures in accordance with the provisions thereof. Notifications shall be provided in accordance with Section 12-2.1, "Traffic Control Plan; Notifications, PCMS, Construction Notification Signs." The Contractor shall conduct his operations in accordance with Section 12-2.2, "Contractor's Operations."

Where road closures are not prohibited by the Specifications, and the Contractor for his own convenience requests a closure, such request shall be made to the Engineer in writing not less than fifteen (15) working days prior to the requested date of closure. Such request shall be accompanied by a Traffic Management Plan (Road Closure and Detour Plan) prepared by a Civil or Traffic Engineer registered by the State of California or an IMSA or ATSSA certified designer. The Plan shall conform to the appropriate Part(s) of the California MUTCD. The Engineer should respond to the Contractor not less than five (5) working days prior to the requested date of closure. If approved by the Engineer, the Contractor shall implement the plan as prepared, including any amendments made by the Engineer thereto. Notifications shall be made in accordance with Subsection 12-2.1, "Traffic Control Plan, Notifications, PCMS, Construction Notification Signs."

Unless approved otherwise in the Special Provisions or by the City Engineer, all roads shall be re-opened to the public at the end of each work day. Temporary paving shall be installed, the appropriate traffic signage shall be removed or left in place, and the roadway shall be made safe for the public.

Where the Engineer determines that non-emergency traffic or other conditions warrant closure of a road, the Engineer may direct the Contractor to immediately prepare a Traffic Management Plan no later than twenty four (24) hours prior to the closure for review by the Engineer. Alternatively, the City may prepare such Plan. The Contractor shall implement the Plan at the time prescribed by the Engineer.

Changed conditions considered to be dangerous or emergencies requiring immediate closure of a road shall immediately be brought to the Engineer's attention. If deemed warranted by the Engineer, the Contractor shall immediately implement the closure in accordance with the instructions given by the Engineer.

12-2.5 Deficiencies

Should the Contractor appear to be neglectful or negligent in furnishing warning devices and taking protective measures as provided in Section 12-2.2, "Contractor's Operations," the Engineer may direct the

Contractor's attention to the existence of a hazard and the necessary warning devices shall be furnished and installed and protective measures taken by the Contractor at the Contractor's expense. Should the Engineer point out the inadequacy of warning devices and protective measures, that action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety or abrogate the obligation to furnish and pay for these devices and measures.

Should the Contractor fail to correct any traffic control deficiency after being notified by the Engineer or Inspector and ordered to correct the deficiency, then the City has the right to remedy the situation and deduct the City's costs from the Contractor's Contract. Contractor will also be responsible if the Engineer or Inspector determines the violation requires an immediate corrective response and the City summarily abates the violation.

If City Municipal Codes requiring compliance with encroachment permits, including an applicable traffic control plan are violated, then the Contractor may be subject a code enforcement action and separate penalty or fine under those provisions.

12-3 Construction Area Traffic Control Devices

12-3.1 Traffic Control Devices

All traffic control devices required in these Specifications and furnished by the Contractor shall conform to the requirements of Section 12-3, "Traffic-Handling Equipment and Devices," of the State Standard Specifications. All references therein to the MUTCD and MUTCD California Supplement shall mean the California MUTCD as defined in Section 1, "Definitions and Terms."

12-4 Measurement and Payment

Unless otherwise provided in the Contract Specifications, all costs for providing Traffic Control and Construction Area Traffic Control Devices as required in this Section 12 shall be measured and paid for at the lump sum price bid for Traffic Control, and includes compensation for furnishing all labor, materials, tools, equipment, signs, devices, pavement markings, channelizers, flaggers as required, road closures and detours, temporary pavement installation and removal and disposal, temporary fences, securing approval of traffic control plans, traffic control plan design, notifications, providing convenient access to adjacent residences and businesses, all devices required for the control of traffic as herein provided, and all incidentals and work required for furnishing Traffic Control and Construction Area Traffic Control Devices as shown on the Plans and specified in the Specifications and the City of Visalia Encroachment Permit Policy Manual.

Full compensation for Portable Changeable Message Signs (PCMS) shall be measured and paid for on a lump sum basis and shall include furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in transporting, installing, maintaining, and removing Portable Changeable Message Signs to the satisfaction of the City of Visalia, and no additional compensation shall be allowed therefore.

Full compensation for Construction Notification Signs shall be paid per each, and shall include furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in transporting, installing, maintaining, and removing Construction Notification Signs to the satisfaction of the City of Visalia, and no additional compensation shall be allowed therefore.

At the discretion of the Engineer, monthly progress payments may be prorated on the basis of the ratio that the completed dollar amount of the work bears to the total contract dollar amount, less any other prorated items.

Where road closures and detours are provided for the convenience of the Contractor which are not otherwise shown on the Plans to be constructed, all costs shall be borne by the Contractor for such road closures and detours, including preparation of the required Traffic Management Plan. No additional payment will be made therefor.

Where the Engineer determines that non-emergency, emergency, or hazardous conditions not created by the Contractor, nor are due to the failure of the Contractor to act or use due diligence and care in performance of the work, warrants road closures and detours which are not otherwise shown on the Plans to be constructed, the cost thereof shall be paid for as extra work in accordance with Section 9-5, "Payment for Extra Work," including preparation of a Traffic Management Plan if so directed by the Engineer.

Where road closures and detours are made necessary due to conditions created by the Contractor, or due to the failure of the Contractor to act or use due diligence and care in the performance of the work, and where no closure or detour was otherwise contemplated, the Contractor shall be responsible for the cost thereof including the cost of preparing a Traffic Management Plan. No additional payment will be made therefor.

SECTION 13 (RESERVED)

SECTION 14 (RESERVED)

SECTION 15 REMOVING EXISTING FACILITIES

15-1 General

15-1.1 Description

This work shall consist of removing existing facilities which interfere with construction within the area to be cleared and grubbed as specified in Section 16, "Clearing and Grubbing," or within any area of construction or reconstruction shown on the Plans or specified in the Specifications, or as directed by the Engineer. Removed facilities shall be disposed of, salvaged, relaid, reset, relocated or reconstructed as shown on the Plans or specified in the Contract Specifications.

Trenches, holes, depressions and pits caused by the removal of existing facilities shall be backfilled with embankment material as provided in Section 19, "Earthwork." Trenches, holes, depressions and pits caused by the removal of street or other facilities that are in surfaced areas, otherwise to remain undisturbed, shall be backfilled with embankment material as provided in Section 19, "Earthwork," and shall be compacted and final paving installed in accordance with the Trench Backfill/Patch Paving Standard Drawing.

15-1.2 Preservation of Property

Existing facilities which are to remain in place shall be protected in conformance with the provisions of Sections 5-3, "Contractor's Responsibility for Work," 5-9, "Preservation of Property," 7-4, "Contractor's Insurance Requirements and Hold Harmless," Section 7-16, Injury or Damage to Persons or property," and Section 8-15, "Utility and Non Street Facilities; Potholing."

A. Traffic Signal Detection Loops

Traffic Signal Detection Loops may exist as far as 300 feet or more from a signalized intersection. After calling for USA mark-outs, the Contractors working within such an area must meet with the City Traffic Signal Technician at the project site to physically review all detection loops in the area in order to minimize damage to the existing loops that are to remain. The Contractor shall be responsible for setting up and having the meeting prior to construction. Any loops that are to remain which are damaged by the Contractor's operation shall, at the Contractor's expense, be replaced in accordance with the provisions in Section 45, "Signals, Lighting and Electrical Systems," and as directed by the Engineer.

15-2 Miscellaneous Facilities

15-2.1 Description

Miscellaneous facilities shall include all structures, drainage, irrigation, water and sewer facilities, water wells or cisterns, drain wells, septic tanks or pits, leach fields, right of way and traffic control facilities including traffic signal detection loops, mail boxes, fences, walls, survey monuments, corners, or other markers, private driveways or approaches, and any other miscellaneous improvements or facilities not mentioned in this Section 15-2 but located within the area to be cleared and grubbed, constructed, or reconstructed, except concrete, bridges and concrete culverts which are provided for in Sections 15-3, "Removing Concrete," and 15-4, "Bridge, Concrete Culvert Removal."

15-2.2 Removal Methods

Removing or abandoning existing facilities which interfere with construction or which are directed to be removed or abandoned by the Engineer shall be performed as shown on the Plans, as specified in the Specifications, or as directed by the Engineer.

A. Well Abandonment

All existing drainage or supply wells, within the limits of the project, which are not in use or intended for future use shall be abandoned in accordance with State of California Bulletin 74-81, Water Well Standards, as amended by Bulletin 74-90, as implemented by the Tulare County Health and Human Services Department. The Contractor performing the well abandonment shall be licensed to perform such work (Class A or Class C-57) in accordance with the provisions of the State Business and Professions Code, Chapter 9, Division 3.

The Contractor shall obtain a permit for the work from the City of Visalia Building Division prior to performing the well abandonment, and shall coordinate with the Building Division for inspection of the work as required. The exposed well shall be securely covered during all periods of inactivity with a suitable cover sufficiently anchored as approved by the County and the City of Visalia to prevent hazard to the public and/or contamination of the well.

B. Obliterating Roads and Detours

Prior to obliteration, all existing bituminous material shall be removed from the roadway and properly disposed of. Unless otherwise specified in the Specifications, obliteration shall consist of rooting, plowing, pulverizing, or scarifying to a minimum depth of 0.5 foot or to the bottom of the impermeable underlying base, whichever is the greater.

After obliteration, the area shall be graded, as shown on the plans or as directed by the Engineer, so that it will blend in with the surrounding terrain and be well drained.

Wherever a portion of existing surfacing is to be obliterated, the outside edge of the existing surfacing, which is to remain in place, shall be sawed to a neat line, prior to obliteration operations.

C. Traffic Stripes and Pavement Markings

Prior to any traffic signs, traffic stripes and pavement markings being removed/modified the Contractor shall have all temporary traffic control measures and signs in place to safely direct traffic through or around the work zone. The City inspector or engineer shall approve the temporary traffic measures prior to any existing street signage, traffic stripes, and pavement markings being removed.

1. Where shown on the Plans or specified in the Specifications, traffic stripes and pavement markings (paint and thermoplastic) to be removed shall be accomplished by wet sandblasting or other approved methods which will cause the least possible damage to the pavement. Dry sandblasting may be used in selected areas only with the permission of the Engineer and with approval of the air pollution control authority having jurisdiction over the area in which the work will be performed. Alternate methods of removal require prior approval of the Engineer.

   Pavement marking images shall be removed in such a manner that the old message cannot be identified. Where grinding is approved by the Engineer for use, the pavement marking image shall be removed by grinding a rectangular area. The minimum dimensions of the rectangle shall be the height and width of the pavement marking. Residue resulting from removal operations shall be removed from pavement surfaces by sweeping or vacuuming before the residue is blown by the action of traffic or wind, migrates across lanes or shoulders, or enters

into drainage facilities. Traffic stripes shall be removed before any change is made in the traffic pattern.

Traffic Stripes and Pavement Markings designated to be removed and not to receive a pavement surface treatment per Section 15-2.2.C.3 shall be removed completely as herein specified. Any voids created by grinding shall be filled using a Type II slurry approved by the Engineer.

All existing striping, stenciling, or other markings, whether shown for removal or not, that will be in conflict with the intent of any new striping shown on the Plans or specified in the Contract Specifications, shall be removed.

2. Removal of Yellow Traffic Striping and Markings that may produce Hazardous Waste Residue:
Where grinding or other authorized methods are used to remove yellow thermoplastic and yellow painted traffic stripe and pavement marking that will produce a hazardous waste residue, immediately contain and collect the removed residue, including dust. Use a HEPA filter-equipped vacuum attachment operated concurrently with the removal operations or other equally effective approved methods for collection of the residue.

   Make necessary arrangements to test the yellow thermoplastic and yellow paint hazardous waste residue as required by the disposal facility and these specifications. Testing methods and procedures shall meet all current applicable state and federal guidelines.

   If analytical test results demonstrate that the residue is hazardous waste, dispose of yellow thermoplastic and yellow paint hazardous waste residue at a Class 1 disposal facility located in California under the requirements of the disposal facility operator within 90 days after accumulating 220 pounds of residue and dust. If the test results demonstrate that the residue is a non-hazardous waste, dispose of the residue at an appropriately permitted CA Class II or CA Class III facility.

3. Traffic stripes and Pavement Markings to be removed for various pavement surface treatment operations shall comply with the following:

   Preparation for Fog Seal or Slurry Seal.
   In addition to the provisions of (1) above, for Fog Seal and Slurry Seal applications, the Contractor shall protect existing permanent raised pavement markers from damage or coating. Damaged or coated markers shall be replaced in accordance with Section 47, "Raised Pavement Markers," at the contractor's expense.

   Preparation for Cape Seal.
   In addition to the provisions of (1) above, for Cape Seal applications the Contractor shall remove permanent raised pavement markers in conformance with Section 15-2.2.D "Pavement Markers," and at the completion of work replace them in accordance with Section 47, "Raised Pavement Markers."

   Preparation for Overlay.
   Unless the Plans or Contract Specifications require otherwise, for Overlay applications, the Contractor shall only remove permanent raised pavement markers in conformance with Section 15-2.2.D "Pavement Markers," and at the completion of work replace them in accordance with Section 47, "Raised Pavement Markers."

4. The Contractor shall remove the existing paint and thermoplastic striping, pavement markings or raised pavement markers where required, no earlier than five (5) days before the start of any of the applications specified in (3) above. After removing the existing paint, markings, or markers, unless otherwise authorized by the Engineer, the Contractor shall immediately install temporary reflectorized markers and temporary reflectorized tape which shall be left in place until beginning the applicable application.

   Extra caution shall be required at locations with traffic signal loops where pavement markings or striping must be removed. Loops are located just below surface grade. Temporary reflective road marker tabs, approved for use by the Engineer, shall be placed in accordance with the manufacturer's specifications but shall not be spaced at more than 15-foot intervals. Temporary reflective road marker tabs shall also be placed at all stop bars that are removed and shall have a minimum of six (6) reflectors or as directed by the Engineer. The Contractor shall also install temporary reflective tape to establish obliterated pavement markings including but not limited to crosswalks, stop bars, stop markings, and turn arrows. The temporary reflective markers and temporary reflective tape shall be the same color as the lane line, centerline, or pavement marking the markers/tape replace. The Contractor shall maintain all temporary reflective markers and temporary reflective tape for the entire duration of the project

   All temporary markers and tape shall be completely removed prior to the applicable applications specified in (3) above and reinstalled upon completion of the application prior to installation of permanent striping. All protective covers of markers left in place shall be removed after the application for nighttime reflectivity and visibility. Prior to the application of paint, thermoplastic striping, and pavement markings, temporary road marker tabs and tape shall be removed completely. Re-installation of Traffic Stripes and Pavement Markings shall comply with Section 46, "Traffic Stripes, Signs, and Pavement Markings."

D. Pavement Markers

Where removal of existing raised pavement markers is called for on the Plans and/or Contract Specifications, markers including underlying adhesive shall be removed by an approved method that will result in the least possible damage to the pavement or other surfacing. Damage to the pavement or surfacing caused by pavement marker removal shall be repaired by the Contractor at the Contractor's expense by methods acceptable to the Engineer. Pavement markers, whether shown for removal or not, that will be in conflict with the intent of any new striping diagram, shall be removed. During the removal of ceramic type pavement markers, screens or other protective devices shall be furnished to contain any fragments as provided for in Section 7-18, "Public Safety." Fragments resulting from the removal of pavement markers shall be removed from the roadway before the lane or lanes are opened to traffic.

Removal shall be at the direction of the Engineer. The cost thereof shall be included in the various items of work; no additional compensation will be paid therefor.

E. Traffic Signs

All traffic signs and street signs within the limits of the improvement project, if required, shall be removed, salvaged and stockpiled at locations designated by the Engineer. Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer. The Contractor shall install (and ultimately remove) temporary traffic control devices,

as required, at locations designated by the Engineer. Traffic control signs and street signs previously removed and salvaged shall be replaced upon completion of the work.

Where the plans indicate the removal of an existing traffic sign from an existing post holding multiple signs, when the top sign is removed, the Contractor shall raise the remaining signs to the top of the existing post.

15-2.3 Disposal

Removed existing facilities that are not to be salvaged or reused in the work shall become the property of the Contractor and shall be disposed of as provided in Section 5-12, "Disposal of Material Outside the Right of Way."

15-2.4 Salvage

Materials from existing facilities which are shown on the Plans or specified in the Contract Specifications to be salvaged, shall remain the property of the City. Salvaging shall include the removal, disassembly, preparation, marking, bundling, packaging, tagging, hauling and stockpiling of salvaged materials or facilities to the location shown on the plans or specified in the Specifications. Materials include parts, articles and equipment of assembled facilities. Salvaging does not include the preparation of existing material that is to be reused in the work.

Materials from an existing facility to be salvaged shall be salvaged; except, when only specific materials from the facility are designated to be salvaged, the remaining materials from that facility shall be removed and disposed of.

Materials to be salvaged shall not be removed until their use is no longer required as determined by the Engineer. Salvaged materials shall be cleaned of earth and other foreign materials. Adhering concrete shall be removed from salvaged materials.

When practicable, salvaged materials shall be hauled directly to the location specified in the Specifications and stockpiled; however, salvaged materials may be temporarily stored at a location selected by the Contractor and approved by the Engineer, and later hauled to and stockpiled at the final location. Materials which are lost for any reason before stockpiling at the final location shall be either replaced by the Contractor at the Contractor's expense, or, at the discretion of the Engineer, the estimated cost of replacement may be deducted from any moneys due or to become due to the Contractor.

Materials designated to be salvaged that are damaged, as determined by the Engineer, shall be segregated from undamaged material. The damaged material shall become the property of the Contractor and shall be disposed of outside the right of way in conformance with the provisions in Section 5-12, "Disposal of Material Outside the Right of Way."

Materials to be salvaged that are damaged as a result of the Contractor's operations shall be repaired by the Contractor, at the Contractor's expense, to the satisfaction of the Engineer. Materials that are damaged beyond repair as a result of the Contractor's operations shall be disposed of outside the street right of way as provided in said Section 5-12 and replaced at the Contractor's expense, or, at the discretion of the Engineer, the estimated cost of replacement may be deducted from any moneys due or to become due to the Contractor. Replacements for lost or damaged materials shall be of the same kind and of the same or better quality and condition as the lost or damaged materials were prior to removal.

Salvaged material shall be packaged and bundled as specified in the Specifications or as directed by the Engineer, except that frames and covers or frames and grates of existing manholes, inlets, or other facilities such as water valve frames and lids, shall be match-marked in pairs.

15-2.5 Reconstruction

Existing facilities that are shown on the Plans or specified in the Contract Specifications to be reconstructed or re-installed at existing or new locations shall conform to the design of the existing facilities and shall be new. The work of reconstruction shall be performed in accordance with the Plans, Contract Specifications, and the requirements of these Specifications for new work of similar character, which apply to the type of facility to be reconstructed, adjusted, modified, remodeled, re-laid, relocated or reset. Where an existing facility not conforming to current Americans With Disabilities Act (ADA) Standards is to be replaced, unless otherwise shown on the Plans or specified in the Contract Specifications, the new facility shall be constructed to meet current ADA standards as directed by the Engineer.

Materials to be reused shall not be removed until their use is no longer required as determined by the Engineer. Materials to be reused in the work shall be cleaned of earth and other foreign materials. Adhering concrete shall be removed from materials to be reused in the work. Materials shown on the Plans or specified in the Contract Specifications to be reused in the work that are damaged as a result of the Contractor's operations shall be repaired by the Contractor, at the Contractor's expense, to the satisfaction of the Engineer. Materials that are damaged beyond repair as a result of the Contractor's operations shall be disposed of outside the right of way in conformance with the provisions in Section 5-12, "Disposal of Material Outside the Right of Way."

Material from existing facilities to be reused in the work that, in the opinion of the Engineer, is unsuitable for use in the work shall become the property of the Contractor and shall be disposed of in conformance with the provisions in said Section 5-12. The unsuitable material shall be replaced with new material. Furnishing of material to replace unsuitable materials as ordered by the Engineer will be paid for as extra work as provided in Section 4-11, "Extra Work."

A. Frames, Covers, Grates, and Manholes

Frames, covers or grates of existing manholes, traffic boxes, inlets or other facilities shall be adjusted to grade with new materials in accordance with the provisions of these Specifications, the Contract Specifications, and the Standard Drawings. In the absence of any requirements set forth by the foregoing, raising existing facilities to grade shall be accomplished using new materials similar in character to those in the original structure. Existing facilities being adjusted to grade shall be cleaned internally of all mud and debris down to and including the bottom of the manhole, other structure, regardless of whether the material was present prior to beginning of construction.

After the existing cover or grate frame has been removed, the top of the structure to be raised shall be trimmed to provide a suitable foundation for the new material. When reconstruction or adjustment of a concrete drainage or other facility requires partial removal of concrete, sufficient concrete shall be removed to permit new reinforcing steel to be spliced to existing reinforcing steel as specified in Section 52-6, "Splicing," of the State Standard Specifications. Existing reinforcement that is to be incorporated in new work shall be protected from damage and shall be thoroughly cleaned of adhering material before being embedded in new concrete.

Concrete removal shall be performed without damage to the portion that is to remain in place. Damage to the existing concrete, which is to remain in place, shall be repaired to a condition

equal to that existing prior to the beginning of removal operations. The cost of repairing existing concrete damaged by the Contractor's operations shall be at the Contractor's expense.

If a manhole cover that is raised to grade is unstable or noisy under traffic, the conditions shall be corrected by placing a coil of asphalt saturated rope, a plastic type washer or asphaltic compounds approved by the Engineer, on the cover seat.

Facilities located in the pavement area shall not be constructed to final grade until the adjacent pavement or surfacing has been completed. All facilities shall be raised to final grade within 10 calendar days of being covered with final paving. The Engineer shall approve the order in which facilities are raised.

Portions of manholes that are to be lowered shall be removed as directed by the Engineer. Where insufficient depth will exist to allow the proper use of grade adjusting rings to raise the cover to final pavement grade, the manhole shall be lowered to an approximate depth of 3.5 feet below finished grade and shall then be reconstructed with the proper taper to finished grade. When existing manholes or inlets are to be abandoned, pipes entering the manhole or inlet 48 inches in inner diameter or less shall be securely closed by a tight fitting plug or wall of minor concrete not less than 0.67 foot thick, or by a tight brick wall not less than 0.67 foot thick with cement mortar joints in accordance with the Standard Drawings. Minor concrete shall conform to the provisions in Section 50, "Portland Cement Concrete," of these Specifications. The bases of manholes or inlets shall be broken in a manner to prevent entrapment of water. Unless otherwise specified by the Contract Specifications, the manhole or inlet shall be demolished to an elevation 3.5 feet below finished grade and backfilled in conformance with the provisions in Section 19-3.3.B, "Structure Backfill."

B. Fences

Corner posts with braces shall be placed at the junctions of reconstructed fences and existing cross fences and the two fences properly fastened thereto. Gates to be reused shall be installed in reconstructed fences at the locations designated by the Engineer. Clearing required for reconstructed fences shall conform to the provisions in Section 16, "Clearing and Grubbing." Removing and reconstructing fence shall be performed in a manner that will prevent the escape of any animals contained within the fenced area.

C. Extending Pipes

Existing pipe shall be extended as shown on the Plans or specified in the Contract Specifications and shall conform to the requirements for installing new pipe. Existing headwalls, endwalls, or other structures shall be removed and disposed of or moved to the extended location as shown on the Plans or directed by the Engineer. When headwalls or endwalls are to be moved, the pipe shall be cut with smooth edges at a point about one foot back of the headwall or endwall along a plane perpendicular to the center line of the pipe. The headwall or endwall shall then be moved and placed in its new location and the new pipe shall be connected to the existing pipe as shown on the plans or as directed by the Engineer.

D. Irrigation and Sprinkler Systems

1. Sprinkler or irrigation lines disturbed by roadway and structure construction shall be temporarily capped when first disturbed. Contractor shall be responsible for irrigating existing lawns, shrubs, trees and other landscaping until the irrigation system is reconstructed. Suitable repairs and reconstruction of irrigations systems shall be completed no later than 10 days from the original disturbance date. Any landscaping that dies or is damaged by the

Contractor's operations shall be replaced to an equivalent level or better than it existed prior to construction at the Contractor's expense.

2. Sprinkler or irrigation lines and facilities disturbed shall be replaced to original condition using similar material as removed. (Galvanized pipe to be replaced with galvanized pipe, brand name heads replaced with same brand name and model.) Sprinkler lines shall be realigned around new improvements and structures in order to duplicate original irrigation coverage.

3. Sprinkler systems disturbed and repaired shall be water-tested by the Contractor, prior to backfilling the trenches, in the presence of the Inspector or Engineer before acceptance of the repair.

15-2.6 Measurement

The work performed under this Section 15-2, "Miscellaneous Facilities," will be measured by units specified in the Contract Specifications for the various work described. In the absence of a contract item setting forth methods of measurement, the cost of the work involved shall be considered as included in the price paid for other various items of work, and no measurement is required.

15-2.7 Payment

When the contract includes separate items with unit or lump sum prices for removing, salvaging, adjusting, modifying, remodeling, abandoning, obliterating, relaying, reconstructing, relocating or resetting any of the miscellaneous facilities, the quantities will be paid for at the contract unit or lump sum price for the item of work involved. If no contract items are provided, then the cost thereof shall be considered to be included in the various other items of work. No additional payment will be made therefor.

Payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in completing the operations as shown on the Plans, as specified in the Specifications, and as directed by the Engineer.

Full compensation for all excavation and backfill required to remove, dispose of, salvage, relay, reset, relocate and reconstruct facilities for which payment is not otherwise provided, shall be considered as included in the contract unit or lump sum price paid for the item of work involved and no separate payment will be made therefor. If no contract items are provided, then the cost thereof shall be considered to be included in the various other items of work. No additional payment will be made therefor.

Full compensation for removal of existing striping, pavement markings, and raised pavement markers where required, including additional grinding outside the limits of the existing pavement marking image to obtain a rectangular area, and placement and removal of temporary pavement markings, and repainting or remarking, shall be considered as included in the contract price paid for the item of work involved and no additional compensation will be allowed therefor. If no contract items are provided, then the cost thereof shall be considered to be included in the various other items of work. No additional payment will be made therefor.

Full compensation for removing, preparing, disassembling, packaging, bundling, tagging, hauling and stockpiling of salvaged materials including any temporary storage prior to stockpiling and disposal of unwanted portions of facilities or damaged materials, shall be considered as included in the contract price paid for the item involved and no separate payment will be made therefor. In the absence of a contract

item, the cost thereof shall be considered as included in the various other items of work. No additional payment will be made therefor.

When the contract does not include separate items for removing any of the existing facilities encountered within the area to be cleared and grubbed or the removal is not included in another item, then payment for removing the facilities shall be considered as included in the contract prices paid for Clearing and Grubbing or excavation of the type in which the facilities are located. If the contract does not include items for clearing and grubbing or excavation, then removing the existing facilities within the area to be cleared and grubbed will be considered as being included in the various items of work; and no additional payment will be made therefor.

When an existing facility which is outside the area to be cleared and grubbed is shown on the Plans or specified in the Contract Specifications to be removed and the contract does not include an item for its removal, or its removal is not included in another item, then payment for removing the facility will be considered as included in the contract price paid for Clearing and Grubbing. If the contract does not include an item for clearing and grubbing, then the cost thereof shall be considered as included in the various items of work; no additional payment will be made therefor.

If the Engineer orders the removal of a facility which is not shown on the Plans or specified in the Contract Specifications to be removed, then removing the existing facility will be paid for as extra work as provided in Section 4-11, "Extra Work."

15-3 Removing Concrete

15-3.1 Description

Concrete shall be removed at the locations shown on the Plans or described in the Contract Specifications, or where directed by the Engineer. Removal shall be to the lines and elevations shown, specified, or determined by the Engineer.

Concrete shall be defined as all or portions of mortared rubble masonry, brick or stone curbs, gutters and sidewalks; and portland cement concrete curbs, gutters, sidewalks, gutter depressions, driveways, aprons, slope paving, island paving, barriers, retaining walls, spillways, dams, structures, foundations, footings, and all other portland cement concrete or masonry construction, except bridges, concrete culverts and pavement which are provided for in Section 15-4, "Bridge, Concrete Culvert Removal," and Section 19-1.1, "Description."

Types of existing subbase, base, surfacing and pavement to be removed will be classified for payment as the type of excavation in which the subbase, base, surfacing and pavement are located. The work for removal of concrete shall include removal and disposal of any reinforcing steel except as provided herein.

Concrete pipe and clay pipe will be considered as miscellaneous facilities to be removed, salvaged, relaid or disposed of as provided in Section 15-2, "Miscellaneous Facilities," and will not be paid for as removing concrete.

15-3.2 Removal Methods

Unless otherwise specified in the Contract Specifications, existing concrete shall be removed to a depth of at least three (3) feet below finished grade. Existing concrete shall be cut to a true line where new concrete is to join existing concrete. Explosives shall not be used for any concrete removal. Concrete removal operations shall be performed without damage to any portion that is to remain in place. Damage to the existing concrete, which is to remain in place, shall be repaired to a condition equal to that existing

prior to the beginning of removal operations. The cost of repairing existing concrete damaged by the Contractor's operations shall be at the Contractor's expense.

Existing reinforcement that is to be incorporated in new work shall be protected from damage and shall be thoroughly cleaned of adhering material before being embedded in new concrete.

Unless otherwise provided in the Contract Specifications, removed concrete shall not be buried in adjacent embankments, and shall be disposed of in accordance with Section 5-12, "Disposal of Material Outside the Right of Way." If burial is otherwise provided for, removed concrete shall be broken into pieces which can be readily handled and incorporated into embankments and is placed at a depth of not less than 3 feet below finished grade and slope lines. The removed concrete shall not be buried in areas where piling is to be placed or within ten feet of trees, pipelines, poles, buildings or other permanent objects or structures.

The floors of concrete basements, pits and structures, that are not required to be removed and which are located within the roadway shall be broken in a manner that will prevent the entrapment of water. Full compensation for breaking up concrete will be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefor.

When there is a contract item for shattering concrete, concrete pavement and similar slabs upon which embankments are to be constructed, the concrete shall be broken up into pieces not larger than 2 feet in greatest dimension and left in place.

15-3.3 Measurement

The work performed under this Section 15-3 and paid for by contract items will be measured by the method specified in the Contract Specifications. In the absence of a contract item for Removing Concrete, the cost thereof will be considered as being included in the lump sum price paid for Clearing and Grubbing and no measurement will be made.

No deductions will be made from any excavation quantities for the volume of concrete removed.

15-3.4 Payment

Payment for Removing Concrete will be made at the price per unit of measurement specified in the Contract Specifications. Payment includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work and performing all the operations involved in removal of concrete as shown on the Plans, as specified in the Specifications, and as directed by the Engineer. No additional compensation will be paid for the removal of concrete containing steel reinforcing or other steel where encountered.

In the absence of a contract item for Removing Concrete, the cost thereof shall be considered as included in the contract lump sum price paid for Clearing and Grubbing. If no contract item is provided for Removing Concrete or Clearing and Grubbing, then the cost thereof shall be considered to be included in the various other items of work. No additional payment will be made therefor.

15-4 Bridge, Concrete Culvert Removal

15-4.1 Description

This work shall consist of removing existing bridges, concrete culverts, or portions thereof. The type and general dimensions of the bridges or portions of bridges or concrete culverts to be removed will be shown

on the Plans or described in the Contract Specifications. For purposes of these Standard Specifications, "bridge" shall include concrete box culverts.

Where portions of bridges or culverts are to be removed, the removal operations shall be conducted so that there will be the least interference to public traffic using the structure involved. When complete bridges or culverts are to be removed, removal operations shall not be started until public traffic is no longer routed over the structure to be removed.

15-4.2 Removal Methods

At least 10 working days before beginning bridge or culvert removal, the Contractor shall submit to the Engineer details of the removal operations showing the methods and sequence of removal and equipment to be used. Traffic control conforming to Section 12, "Traffic Control; Construction Area Traffic Control Devices," and as directed by the Engineer shall be provided.

Materials that are to be salvaged shall be carefully removed and stockpiled near the site at a location designated by the Engineer. Material which is to be used in any specified reconstructed bridge work and has been damaged or destroyed as a result of the Contractor's operations shall be repaired or replaced by the Contractor at the Contractor's expense.

Piling, piers, abutments and pedestals shall be removed to at least one foot below ground line or three feet below finished grade, whichever is lower.

Where portions of a bridge or culvert are to be removed, the removal operations shall be performed without damage to any portion of the structure that is to remain in place. In these cases, tools with a manufacturer's rated striking energy in excess of 1,200-foot pounds per blow, a freely falling mass or a falling mass attached to a cable, rope or chain shall not be used for breaking or removing concrete which is attached to or supported by the bridge. Existing reinforcement that is to be incorporated in new work shall be protected from damage and shall be thoroughly cleaned of all adhering material before being imbedded in new concrete.

A freely falling mass or a falling mass attached to a cable, rope or chain shall not be used above any area open to the public. Falling masses shall not be used within 30 feet horizontally of any area open to the public unless adequate protective shields are in place. Protective shields shall be of sufficient size and strength to prevent any debris or equipment from endangering the public. The shields shall be designed and proportioned as required by the size of equipment and method of operations employed, but in no case shall the shields have a strength less than that provided by good, sound 2 inch thick Douglas fir planking supported on posts at 5 foot centers.

Before beginning concrete removal operations involving the removal of a portion of a monolithic concrete element, a saw cut approximately one inch deep shall be made to a true line along the limits of removal on faces of the element which will be visible in the completed work.

15-4.3 Measurement and Payment

Unless otherwise provided in the Contract Specifications, the work to be performed in accordance with this Section 15-4 will be measured and paid for on a lump sum basis price paid for Bridge Concrete Removal or Culvert Removal. Payment shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in removing and disposing of bridges or concrete culverts or portions thereof, including salvaging materials not to be reused in the project when salvaging is specified and not otherwise paid for, as shown on the Plans, as specified in the Specifications, and as directed by the Engineer.

Full compensation for removing materials that are to be reused in the project shall be considered as included in the contract prices paid for reconstructing, relocating or resetting the items involved, or in such other contract pay items that may be designated in the Contract Specifications. No additional payment will be made therefor.

SECTION 16 CLEARING AND GRUBBING

16-1 Description

Clearing and Grubbing shall consist of the removal and disposal of all objectionable materials within the limits of the project as required by the Plans, the Contract Specifications, and as directed by the Engineer. Clearing and Grubbing shall be performed in advance of grading operations and in accordance with the requirements of these specifications. Reference is made to Section 15, "Removing Existing Facilities." Any existing facility not specifically designated on the plans or Contract Specifications to be removed shall remain and be protected in place in accordance with this Section 16. Removal and disposal of existing roadway or alley materials in advance of roadway or alley reconstruction shall be considered as excavation for the associated construction items and not a part of, or to be paid for as, Clearing and Grubbing. Any holes, depressions, or pits resulting from the removal of objectionable material shall be backfilled in accordance with Section 19-4, "Embankment Construction."

16-2 Preservation of Property

The Contractor shall comply with the requirements of Sections 5-3, "Contractor's Responsibility for Work," 5-9, "Preservation of Property," 7-4, "Contractor's Insurance Requirements and Hold Harmless," 7-16, "Injury or Damage to Persons or Property," and Section 8-15, "Utility and Non-Street Facilities; Potholing." Whether shown on the Plans or not, existing improvements, adjacent property, utility and other facilities, and trees and plants that are not to be removed shall be protected from injury or damage resulting from the Contractor's operations. Unless otherwise specified in the Contract Specifications or on the plans, only trees and plants that are designated on the plans or marked for removal by the Engineer shall be removed.

The Contractor shall notify Underground Service Alert at 811 or 1-800-227-2600 a minimum of 5 working days prior to construction and shall make such additional investigations and examinations as necessary to determine the existence and locations of all pipes, conduits, and other underground improvements and shall consult with and advise the owners of the utilities before undertaking any work that might endanger them.

The Contractor shall bear full responsibility for any damage to pipes, conduits, poles, or any other structures or utilities. The Contractor shall not make any claim for inconvenience, delay or added cost of performing the work which may be attributed in any degree to inaccuracy of information furnished by the City of Visalia relative to the locations, sizes, dimensions, depths, and character of any pipes, conduits, poles or other structures and utilities.

Existing survey monuments and stakes shall be fully protected from damage or displacement and they shall not be disturbed unless directed by the Engineer. Any survey monumentation disturbed in connection with the Contractor's operations shall be reset in accordance with Section 37-2, "Survey Monuments." Such re-monumentation shall be replaced at the Contractor's expense with no additional compensation paid therefor.

16-3 Construction

Unless otherwise specified or shown on the Plans or specified in the Contract Specifications, the entire area within the project limits shall be cleared and grubbed by the Contractor. No payment will be made to the Contractor for clearing and grubbing outside these limits, unless such work is authorized by the Engineer.

All of the work shown on the Plans and included in the Specifications that is located in public streets, alleys, parks, trails, or other public rights of way of the City of Visalia shall be done in accordance with

City ordinances regulating the use of public rights of way within the City, except as otherwise provided in these Specifications. The Contractor shall comply with all regulations and requirements of the City of Visalia and shall conduct his operations in compliance therewith.

Within the limits of Clearing and Grubbing, the area above and below the natural ground surface shall be cleared of all vegetation, such as trees, logs, upturned stumps, roots of down trees, brush, grass, weeds or other objectionable material as determined by the Engineer. The grading provisions of the City of Visalia Landscape Standards and Specifications apply for special treatment of grass, weeds, and other organic material in projects involving landscape planting. Trees and other vegetation not to be removed shall be protected from damage in accordance with these specifications

Grubbing shall extend to the outside excavation and fill slope lines. Within the limits of clearing, all stumps, roots 1 1/2 inches in diameter or larger, buried logs, and all other objectionable material shall be removed 3 feet below and parallel with the existing ground surface or subgrade, whichever is deeper.

Trees and plants that are not to be removed shall be protected from injury by the Contractor at his expense. Chapter 12.24 of the City Municipal code regarding the preservation and protection of Oak trees must be complied with.

Within the limits of Clearing and Grubbing, the area below the natural ground surface shall be grubbed to a depth necessary to remove all organic material and other objectionable material as determined by the Engineer, including, but not limited, to concrete or masonry, wood, metal, or other scrap. All recyclable items and materials to be removed shall be removed in a manner that facilitates their recycling.

Trees designated for removal shall be removed in such a manner as not to injure standing trees, plants, and improvements which are to be preserved. Tree branches extending over the roadway which interfere with the work shall be trimmed in a professional manner by the Contractor at the direction of the Engineer.

All concrete, asphalt-concrete and oiled dirt within the right-of-way shall be removed by the Contractor unless designated to remain on the Plans. Said concrete, asphalt-concrete, or oiled dirt located within the roadway, alley, curb and gutter, or sidewalk prism to be replaced, shall be considered as included in the contract lump sum price paid for Roadway Excavation and not as Clearing and Grubbing.

Where a portion of an existing concrete facility is to be removed, it shall be cut to a minimum depth of 1.5 inches with an abrasive type saw at the first scoring line at or outside the planned joint and removed without damage to any portion that is to remain in place. If curbs and gutters cannot be cut off square and neat, the entire curb and gutter shall be removed to the nearest weakened plane or expansion joint. The shortest allowable remaining portion between expansion joints shall be 8 lineal feet. No patching at expansion joints will be permitted. Removal of portions of asphalt concrete shall be done as indicated in the Plans and Specifications.

Where a new concrete facility is to be installed adjacent to an existing facility the Contractor shall install dowels connecting the new and existing facilities as shown on the Plans and Standard Drawings.

Existing manholes, drain wells, drainage structures, structures and headwalls to be abandoned shall be removed in accordance with Section 15, “Removing Existing Facilities.” If no contract item is provided therefor, removal shall be considered as Clearing and Grubbing.

All traffic signs and street signs within the limits to be cleared and grubbed shall be considered as "Miscellaneous Facilities," and if required, shall be removed, salvaged and stockpiled in accordance with Section 15-2, "Miscellaneous Facilities."

16-4 Removal and Disposal of Materials

All materials removed and not otherwise specified to be salvaged or reused in the work shall be lawfully disposed of by the Contractor at disposal sites outside the right-of-way in conformance with. Section 5-12, "Disposal of Material Outside The Right- of-Way."

All existing materials that are designated to be salvaged shall be removed, cleaned and hauled to the location shown on the Plans or specified in the Contract Specifications and in accordance with Sections 6-11, "Salvage of Materials," and 15-2.4, "Salvage." The roadway and adjacent areas shall be left with a neat and finished appearance. No accumulation of flammable material shall remain on, or adjacent to, the right-of-way.

16-5 Measurement

Clearing and Grubbing will be measured on a lump sum basis.

16-6 Payment

The lump sum price paid for Clearing and Grubbing shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in clearing and grubbing as shown on the Plans, set forth in the Contract Specifications, and as directed by the Engineer.

If the Contract does not include a pay item for Clearing and Grubbing as herein specified, and unless otherwise provided in the Contract Specifications, full compensation for clearing and grubbing required to perform the construction operations specified shall be considered as included in the price bid for other various items of work and no additional compensation will be paid therefor.

SECTION 17 WATER USE

17-1 Description

This work shall consist of developing a water supply and furnishing all water required for the work, and applying all water. The Contractor shall comply with the provisions of Section 5-13, "Electric and Water Service."

Water for use in the work shall be potable only.

Potable water may be furnished by the Contractor from an independent source, or may be obtained from the California Water Service Company, hereinafter referred to as CWS, as specified in Section 5-13.

In compliance with the City of Visalia Landscape Standards and Specifications, the water supply for landscape planting and irrigation systems shall be provided by the Contractor. A permanent water meter will be furnished by the California Water Service Company for each irrigation system connection to the City water system unless otherwise shown on the Plans or specified in the Contract Specifications. The Contractor will be responsible for all fees and charges for all water consumed through these connections, including water consumed through the temporary hydrant meter obtained in compliance with this Section 17, and water consumed for irrigation system testing purposes and for landscape irrigation through the maintenance periods specified in the City of Visalia Landscape Standards and Specifications, and up to final acceptance of the work by the Engineer. Water for construction purposes for landscape planting and installation of irrigation systems, such as for dust control, compaction, etc., shall be obtained in accordance with 5-13, "Electrical and Water Service."

17-2 Application

Water shall be applied in the amounts, at the locations, and for the purposes designated in the Contract Specifications and these Standard Specifications, and as ordered by the Engineer. Water for compacting embankment material, soils, subgrade, subbase, base and surfacing material, and for providing dust control shall be applied by means of pressure type distributors or pipe lines equipped with a spray system or hoses with nozzles that will ensure a uniform application of water. Equipment used for the application of water shall be equipped with a positive means of shut off.

Unless otherwise permitted by the Contract Specifications or the Engineer, or unless all the water is applied by means of pipe lines, at least one mobile water distribution unit with a minimum capacity of 1,000 gallons shall be available for applying water on the project at all times.

17-3 Chemical Additives (Not Used)

17-4 Payment

Full compensation for developing and furnishing water in compliance with this Section 17 shall be considered as included in the various contract items of work requiring water, including water required for irrigation systems testing and landscape watering through the maintenance period specified in the City of Visalia Landscape Standards and Specifications. No additional compensation will be paid therefor. In accordance with Section 4-10, "Changes," no separate or additional compensation for developing and furnishing additional water will be made for any increase or decrease in the quantity of water required, regardless of the reason for such increase or decrease.

SECTION 18 DUST PALLIATIVE

18-1 General

Dust palliative shall be as specified in Section 18, “Dust Palliative,” of the State Standard Specifications except that the Payment section will be modified as noted in this Section 18.

18-2 Payment

Full compensation for furnishing Dust Palliative in compliance with this Section 18 shall be considered as included in the various contract items of work requiring dust palliative. No additional compensation will be paid therefor. In accordance with Section 4-10, "Changes," no separate or additional compensation for developing and furnishing additional dust palliative will be made for any increase or decrease in the quantity of dust palliative required, regardless of the reason for such increase or decrease.

SECTION 19 EARTHWORK

19-1 General

19-1.1 Description

This work shall consist of furnishing all labor, materials, equipment and incidentals and for performing all the work that may be required to construct and maintain the roadway, pipeline, or other facilities requiring earthwork as shown on the Plans and Standard Drawings, as specified in the Contract Specifications, and as directed by the Engineer, complete and in place, including but not limited to the following:

A. Excavation, grading, removal and replacement of material, placement of embankment, importing and exporting material, subgrade preparation and compaction and all other operations required in the construction of the finished earth surface for roadways and other surface improvements, including performing all operations necessary to excavate all materials, regardless of character and subsurface conditions, from the roadway or areas adjacent thereto.

B. Excavation, placement, backfill, importing and exporting material, compaction, and restoration of surfaces of trenches for the placement of pipelines, conduits and other utilities including, but not limited to, pipelines for sewer, water, non-potable water, storm drains, irrigation, electrical and fiber optic conduits.

C. Excavation, placement, backfill, importing and exporting material, compaction, and restoration of surfaces for the construction or installation of structures.

D. Excavation, backfill, importing and exporting material and compaction of drainage and irrigation ditches and channels;

E. Excavation of selected material from the roadway and borrow material for use as specified; construction of embankments, including the placing of selected material and imported borrow in connection therewith as specified; backfilling holes, pits and other depressions within the roadway area; applying water; removing and replacing unsuitable material;

F. Excavation, placement, importing and exporting material, compaction and grading road approaches, driveways, and connections; removal of unstable material outside the roadway prism; preparation of basement material for the placing of other material thereon;

For purposes of this Section 19, “roadway” shall include streets, alleys, easements, trails, parking lots, park sites, or the sites of other surface improvement work. Whenever reference to finished grade or finished surface is made, it shall be considered to be the finished surface of the completed facility.

All hauling of material from, to, or on the job site shall comply with Section 6-12, “Materials Hauling.” Where loads are not required to be covered, if directed by the Engineer, the loads shall be watered after trimming to eliminate dust as provided in Section 10, “Dust Control.” The Contractor shall comply with the provisions of Sections 5-9, "Preservation of Property,” and 5-10, "Protection of the Work,” and Section 15, “Removing Existing Facilities,” relative to protection and preservation of property, the work, and other utilities in performing earthwork operations.

Quantities of all types of existing subbase, base, surfacing, or pavement removed will be included in the quantities of the type of excavation in which they are located, and no separate payment will be made therefor.

Clearing and Grubbing for earthwork operations shall conform to the provisions in Section 16, “Clearing and Grubbing.”

Applying water for earthwork operations shall conform to the provisions in Section 17, "Water Use."

19-1.2 Protection of Property

The Contractor shall comply with the provisions of Section 5-3, "Contractor's Responsibility for the Work," Section 5-9, "Preservation of Property," Section 7-4, "Contractor's Insurance Requirements and Hold Harmless," Section 7-16, "Injury or Damage to Persons or Property," and Section 8-15, "Utility and Non Street Facilities; Potholing." Operations shall be conducted in such a manner that existing roadway or other facilities, utilities, railroad tracks, and other non street facilities which are to remain in place, shall not be damaged. The Contractor, at the Contractor's expense, shall furnish and install sheet piling, cribbing, bulkheads, shores or whatever means may be necessary to adequately support material carrying the facilities, or to support the facilities themselves and shall maintain the supports until they are no longer needed. Temporary pavements, facilities, utilities and installations shall also be protected until they are no longer required. When temporary supports and other protective means are no longer required, they shall be removed and disposed of as provided in Section 5-12, "Disposal of Material Outside the Right of Way."

19-1.3 Grade Tolerance

The grading plane shall not vary consistently above or below the design grade. Except for cuts made for roadway prisms, the tops and ends of cuts shall be rounded as directed by the Engineer.

Immediately prior to placing subsequent layers of material thereon, the grading plane shall conform to one of the following:

A. When asphalt concrete or asphalt concrete base, or concrete pavement, is to be placed on the grading plane, the grading plane at any point shall not vary more than 0.02 foot above or below the grade established by the Engineer.

B. When subbase or base material (other than asphalt concrete base) is to be placed on the grading plane, the grading plane at any point shall not vary more than 0.04 foot above or below the grade established by the Engineer.

C. When sidewalk, curb, curb and gutter, driveways and other road structures are to be placed on the grading plane, the grading plane at any point shall not vary more than 0.02 foot above or below the grade established by the Engineer.

Where surface improvements shall be placed on the grading plane such as sidewalk, curb and gutter, drive approaches, asphalt concrete, concrete pavement, or other improvements the thicknesses shown or called out in the Specifications, Plans and Standard Drawings shall be considered minimum thicknesses and the grading tolerances specified above shall not decrease these required minimum thicknesses.

19-1.4 Removal and Disposal of Buried Man Made Objects

If a buried man made object encountered in excavation is to be removed and its removal and disposal is not included in another item of work, the removal and disposal will be paid for at the contract unit price or lump sum price paid for the type of excavation in which the object is encountered, i.e., roadway excavation, trench or structure excavation, etc. However, if the presence of the object is not indicated on the plans or in the Contract Specifications and its presence could not have been ascertained by visual inspection, the removal and disposal of the object will be paid for as extra work as provided in Section 4-11, "Extra Work," instead of at the applicable contract item price if the Contractor so requests in writing. The request shall be made prior to removal. Unless otherwise specified in the Contract Specifications, no blasting of any kind will be permitted.

Where backfill of a cavity or depression resulting from removal of a buried manmade object is required, it will be paid for in accordance with Section 15, "Removing Existing Facilities," or Section 16, "Clearing and Grubbing," except that backfill for objects removed from within trench or structure excavations will not be paid for separately but included in the price paid for the pipe, conduit or structure requiring the excavation. Where the buried object is not shown on the plans and could not reasonably be ascertained from the surface, and backfill is required but not covered by any other item of work, and the cavity is not located in a trench or structure excavation, payment for backfill shall be made in accordance with said Section 4-11, "Extra Work."

19-1.5 Compaction Testing & Quality Assurance

No compaction tests of finished subgrade shall be made until such time as the surface is finished to within grade tolerances required by Section 19-1.3 "Grade Tolerance" and the Engineer has been notified of the time that such compaction tests will be made. The Inspector or Engineer shall specify the locations where compaction tests are to be made. Compaction testing shall be provided in accordance with Section 6-9 of these Specifications.

Prior to placing any subbase, base, or surfacing materials on the subgrade, the subgrade shall be proof-rolled with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in the direction of travel parallel with the roadway. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle truck or water truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer or Inspector, and replace with compacted backfill or fill as directed.

Proceed with placement of subbase, base, or surfacing materials only after unsatisfactory conditions have been corrected.

19-2 Roadway Excavation

19-2.1 General

Roadway excavation shall consist of all excavation involved in the grading and construction of the roadway, embankments, ditch or channel excavation, except trench and structure excavation and any excavation separately designated and paid for as a separate item. Roadway Excavation shall include the area located within the prism of the roadway to be constructed as shown on the Plans and Standard Drawings. "Roadway" shall have the meaning ascribed by Section 19-1.1, "Description."

19-2.2 Unsuitable Material

Unsuitable material encountered below the natural ground surface in embankment areas or below the grading plane in excavation areas shall be excavated and disposed of as directed by the Engineer. Unsuitable material is defined as material the Engineer determines to be:

A. of such unstable nature as to be incapable of being compacted to specified density using ordinary methods at optimum moisture content; or

B. too wet to be properly compacted and circumstances prevent suitable in place drying prior to incorporation into the work; or

C. otherwise unsuitable for the planned use.

The presence of excessive moisture in a material is not, by itself, sufficient cause for determining that the material is unsuitable.

The removal and disposal of unsuitable material will be paid for as roadway excavation for the quantities involved if the removal of the unsuitable material is shown on the plans or specified in the Contract Specifications.

If the removal of the unsuitable material is not shown on the plans or specified in the Contract Specifications, the removal and disposal of the unsuitable material will be paid for at the contract price for roadway excavation for the quantities involved unless either the Engineer, prior to removal of any unsuitable material, orders the unsuitable material to be removed and disposed of and paid for as extra work as provided in Section 4-11, "Extra Work," or the Contractor, prior to removal of the unsuitable material, requests in writing that the removal and disposal of the unsuitable material be paid for as extra work as provided in said Section 4-11. However, no payment will be made for removal and replacement or re-working of unsuitable material if such condition is deemed by the Engineer to have been caused by the Contractor's operations such as, but not limited to, over-watering or failure to adequately divert drainage around the site of work.

When unsuitable material is removed and disposed of, the resulting space shall be backfilled with material suitable for the planned use. Unless otherwise specified or directed by the Engineer, the material shall be either material conforming to Section 19-2.6, "Selected Material," or conforming to Section 19-4.2, "Imported Borrow." The backfill material shall be placed and compacted in accordance with Section 19-4, "Embankment Construction."

19-2.3 Slopes

Excavation and embankment slopes shall be constructed in conformance with the lines and grades shown on the plans. When completed, the average plane of the slopes shall conform to the slopes indicated on the Plans and no point on the completed slopes shall vary from the designated slopes by more than 0.10 feet measured at right angles to the slope. The tops of excavation slopes and the ends of excavations shall be rounded as shown on the plans or as directed by the Engineer.

19-2.4 Surplus Material/Export Material

Unless otherwise shown on the Plans or specified in the Contract Specifications, surplus excavated material shall be disposed of outside the right of way in accordance with Section 5-12, "Disposal of Material Outside the Right of Way." The Contractor shall not borrow or waste material unless authorized in writing by the Engineer. The surplus excavated material shall be classified as Export Material. The Export Material bid item, where used, shall consist of, but not be limited to, furnishing all labor, materials, equipment and incidentals and for performing all the work that may be required to excavate, stockpile, load, haul, and perform all other work to dispose of surplus excavated material outside the right of way as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer.

Export Material is a final pay item and if listed on the bid schedule will be paid on a lump sum basis. If the quantity of surplus material is shown on the Plans or specified in the Contract Specifications as Export Material, the quantity shown or specified is approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided for work involved with removing and disposing of any surplus material in excess of the quantities shown on the bid item schedule. The Contractor shall be satisfied that there is sufficient suitable material available for the completion of any embankments before disposing of any material outside the right of way. Any shortage of material, caused by premature

disposal of any material by the Contractor, shall be replaced by the Contractor and no compensation will be allowed the Contractor for such replacement.

If the Contract does not include a pay item for Export Material under this Section 19-2.4, and unless otherwise provided in the Contract Specifications, full compensation for Export Material required to perform the construction operations specified shall be considered as included in the lump sum price bid for Roadway Excavation.

19-2.5 Deficiency Material/Import Material

If the quantity of acceptable material from excavation is not sufficient to construct the roadways and embankments required by the work, the quantity of material needed to complete the embankments shall consist of imported borrow conforming to Section 19-4.2, "Imported Borrow," as shown on the Plans, or specified in the Contract Specifications, or as determined by the Engineer. The Contractor shall obtain the imported borrow in conformance with the provisions in said Section 19-4.2. The imported borrow shall be classified as Import Material. The Import Material bid item, where used, shall consist of, but not be limited to, furnishing all labor, materials, equipment and incidentals and for performing all the work that may be required to purchase, load, haul, spread, place, compact and perform all other work to install the import material complete and in place as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer

Import Material is a final pay item and if listed on the bid schedule will be paid on a lump sum basis. If the quantity of surplus material is shown on the Plans or specified in the Contract Specifications as Import Material, the quantity shown or specified is approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided for work involved with hauling and placing any import material in excess of the quantities shown on the bid item schedule.

If the Contract does not include a pay item for Import Material under this Section 19-2.5, and unless otherwise provided in the Contract Specifications, full compensation for Import Material required to perform the construction operations specified shall be considered as included in the lump sum price bid for Roadway Excavation

19-2.6 Selected Material

Selected material shall be defined as material which is excavated from a location within the right of way as specified in the Contract Specifications or shown on the plans, and the Contractor shall have no choice in the selection.

Selected material shall be used as shown on the plans or specified in the Contract Specifications.

Topsoil excavated within the limits of the project shall be considered as selected material and may be reused as topsoil in landscaping areas.

Granular non-expansive native soil from excavations may be used, unless noted otherwise on the Plans or in the Specifications, as selected material for backfill in holes, pits or other depressions caused by removal of existing facilities in conformance with Section 15, "Removing Existing Facilities," Section 16, "Clearing and Grubbing," Section 19-1.4, "Removal and Disposal of Buried Man-Made Objects," or Section 19-2.2, "Unsuitable Material." Selected Material used for backfill or embankment construction shall be granular non-epansive native soil from excavations free from organic, vegetation, and rocks or cobbles larger than 3 inches or shall comply with Section 19-4.2, "Imported Borrow."

When selected material is shown on the Plans or designated in the Contract Specifications as a specified layer in the roadway prism, spreading and compacting the material shall conform to the provisions in Section 25, "Aggregate Subbases," of the Specifications. When practicable, and processing is not specified, selected material shall be hauled directly from excavation to its final position in the roadway prism and compacted in place and the work will be paid for at the contract lump sum price for Roadway Excavation.

When practicable, selected material shall remain in place until it can be excavated and placed in final position as provided above. No additional compensation will be allowed for any delay or inconvenience in excavation operations, except that if ordered in writing by the Engineer, selected material may be excavated and stockpiled at locations designated by the Engineer and later placed in final position in the roadway prism.

Excavating selected material and stockpiling, if required, will be paid for at the contract price for roadway excavation. Removing the selected material from stockpiles for later placement in its final position will not be paid for. Placement and compaction will be paid for at the unit price bid for the type of construction requiring the use of selected material. No payment for stockpiling of selected material will be made.

19-2.7 Subgrade Preparation, Compaction

Reference is made to the definitions in Section 1 for, “Basement Material,” “Grading Plane,” and “Subgrade.” Unless otherwise shown on the Plans or specified in the Contract Specifications, for streets divided by a concrete median island, the grading plane extends from the back of the concrete curb and gutter adjacent to the outside travel lane, parking lane, or bicycle lane (the “outside curb and gutter”), to the back of the concrete median curb. For streets not divided by concrete median island, the grading plane extends from the back of one outside curb and gutter to the back of the opposite outside curb and gutter. For alleys, trails, paths, or other places to receive an improved surface, the grading plane shall extend 12 inches beyond (right of way permitting) either side of the planned finish surface.

The preparation and compaction of the subgrade below the grading plane to receive subbase, aggregate base, asphalt-concrete, concrete or other paving materials shall consist of the following:

The soil material beneath the grading plane shall be bladed or disked to a depth of 6 inches (unless noted otherwise in the Plans, Specifications, or Special Provisions) and all rocks, hardpan chunks or otherwise unsuitable material over 2 inches in greatest dimension, shall be removed and disposed of off the project site in accordance with Section 5-12, “Disposal of Material Outside the Right of Way.”

The material thus disced or bladed shall be thoroughly mixed, watered and rolled to a smooth and even condition to a relative compaction of not less than 95 percent in compliance with Sections 6-8, “Samples and Tests,” and 6-9, “Compaction Tests,” to a depth of not less than 6 inches below the grading plane or as otherwise shown on the Plans or Standard Drawings or specified in the Contract Specifications.

Any soft, spongy or otherwise unstable areas shall be repaired by completely removing the material and replacing it with acceptable materials in accordance with these Specifications. Before subbase, aggregate base, asphalt-concrete, concrete or other paving material is placed, the Engineer will require, at the Contractor’s expense, the subgrade to be proof rolled as required in Section 19-1.5 to ascertain that there are no such soft or spongy areas.

No subsequent layer of a structural section shall be placed until the finished subgrade is in a stable condition satisfactory to the Engineer, regardless if said subgrade passed any prior compaction test. Any trenches cut for pipelines or conduit installation after the subgrade or any other layer of the roadway prism has been stabilized, shall be compacted in compliance with Section 19-3.3E, "Compaction," herein. It shall be the Contractor's responsibility to ensure that others doing work within the area under his control, including subcontractors, utility and communications contractors, comply with this provision.

The relative compaction of the top 6 inches of subgrade or basement material under curb returns including the ramps and adjacent sidewalk, landing, driveway approaches including adjacent sidewalk, valley gutters, paved trails, and alleys shall be no less than 95 percent.

The relative compaction of the top 6 inches of subgrade or basement material under sidewalk shall be no less than 90 percent.

All compacted subgrade soils must indicate a moisture content within 2%± of optimum.

No compaction test of subgrade shall be made until such time as the subgrade is finished to within the grade tolerances specified in these specifications. For Public projects the Contractor shall notify the Inspector a minimum of 2 working days, prior to when the subgrade is ready for compaction testing, and the Inspector will notify the appropriate testing laboratory designated to perform such tests. The Inspector or Engineer shall specify the locations where compaction tests are to be made.

No excavation shall be made below the plane of the bottom of curb or curb and gutter subsequent to installing curb or curb and gutter until backfill has been placed behind the curb.

19-2.8 Measurement & Payment

Roadway Excavation

Roadway Excavation will be paid for at the contract lump sum price. Roadway Excavation is a final pay item. Any quantities shown on the plans or on the bid item schedule are considered approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided therefor.

The price paid for Roadway Excavation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing Roadway Excavation complete and in place in accordance with this Section 19-1 "General," and 19-2 "Roadway Excavation," as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer, excepting the work performed under the Export Material and Import Material Bid items if used.

Where no bid item is provided for Roadway Excavation, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

Export Material

Export Material will be paid for at the contract lump sum price. Export Material is a final pay item. Any quantities shown on the plans or on the bid item schedule are considered approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided therefor.

The price paid for Export Material shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing Export Material

complete and in place in accordance with Section 19-2.4 "Surplus Material/Export Material," the other applicable portions of Section 19-1 and 19-2, as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer.

If the Contract does not include a pay item for Export Material, and unless otherwise provided in the Contract Specifications, full compensation for Export Material required to perform the construction operations specified shall be considered as included in the price bid for Roadway Excavation. Where no bid item is provided for Roadway Excavation, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

Import Material

Import Material will be paid for at the contract lump sum price. Import Material is a final pay item. Any quantities shown on the plans or on the bid item schedule are considered approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided therefor.

The price paid for Import Material shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing Import Material complete and in place in accordance with Section 19-2.5 "Deficiency Material/Import Material," the other applicable portions of Section 19-1 and 19-2, and as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer.

If the Contract does not include a pay item for Import Material, and unless otherwise provided in the Contract Specifications, full compensation for Import Material required to perform the construction operations specified shall be considered as included in the price bid for Roadway Excavation. Where no bid item is provided for Roadway Excavation, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

19-3 Trench and Structure Excavation, Backfill, and Surface Restoration

19-3.1 General

This work shall consist of all excavation, backfill, importing and exporting material, and compaction necessary for the construction or installation of underground pipelines, conduits, structures and other facilities, and the replacement or restoration of surfaces disturbed by such work, all as set forth in the Plans, Standard Drawings, the Specifications, Contract Documents and as directed by the Engineer. As a minimum, structures shall include manholes, storm drain inlets, water valve boxes, cleanouts, traffic control boxes, pull boxes and any other structures, vaults, or boxes located within the street right of way.

Backfill, compaction, and surface restoration of potholes or other excavations performed to determine the location of underground utilities or facilities as required by Section 8-15, "Utility and Non-Street Facilities; Potholing," shall conform to the applicable portions of this Section 19-3 and to the special backfill requirements of said Section 8-15.

19-3.2 Trench and Structure Excavation

Excavations shall be made to the depths and widths required to accommodate the construction or installation of pipelines, conduits and structures to specified dimensions and to the lines and grades shown on the Plans.

The Contractor shall comply with the provisions of Sections 7-12, "Safety Provisions; First Aid; Injury/Illness Prevention Program," 7-13, "Worker Protection From Toxic Or Explosive Gases, Confined

Spaces Entry," and 7-15, "Worker Protection From Caving Ground In Excavations," and all Safety Orders issued by the State Division of Industrial Safety. Material excavated from trenches or for structures shall be placed to offer minimum obstructions to traffic.

The City has made every effort to locate and show all underground utilities and facilities on the plans. However, before installation of any new improvements shown on the Plans, the Contractor shall be responsible to field verify the locations by calling for USA mark-outs, potholing, and any other means or methods to determine both the horizontal and vertical locations of underground utilities and other facilities, and shall notify the Engineer immediately if conflicts occur. The Contractor shall comply with the provisions of Section 8-15, "Utility and Non-street Facilities; Potholing," relating to existing utilities, and the location and protection thereof. The location of subsurface obstructions found in the field may necessitate a variance in the depth or alignment of proposed facilities.

Prior to commencing construction of the proposed improvements shown on the plans, the Contractor will be responsible for potholing and verifying the horizontal location and vertical elevation of any utility connection points shown on the Plans. Any cost incurred by the Contractor because of his failure to comply with this requirement will be paid for by the Contractor.

When a trench or structure site is to be located in an existing oiled earth or pavement area, the existing surfacing to be removed shall be cut to a clean and neat line by appropriate methods shown on the plans or as approved by the Engineer along each side of the trench or around the structure site. Existing surfacing, when removed, shall be kept separated from the material that is to be returned to the excavation as backfill. Failure to comply with this requirement shall be grounds for rejection of the contaminated material for use as backfill.

General Note: Prior to Construction the Contractor shall be responsible for reviewing the pipe manufacturers recommended installation procedures for the type of pipe being used and comparing the recommended procedures with the City of Visalia's Standard Plans and Standard Specifications. If any discrepancy exists, the Contractor shall be responsible for bringing the discrepancy to the attention of the Engineer. The Engineer shall make the final decision on details of the trench. The Contractor will be responsible for installing the pipe in the manner that provides the highest level of support for the pipe.

All pipe with an inner diameter greater than six inches (6") shall have a prepared and compacted bedding except as follows: bedding preparation is not required for precast rubber gasket reinforced concrete pipe with an inner diameter of twenty-four inches (24") or less where firm and unyielding native soil is present at the bottom of the trench. Trenches shall be over-excavated a minimum of 6 inches below the grade established for the bottom of the pipe and then backfilled to the design pipe grade with granular non-expansive native material meeting the requirements of these specifications and thoroughly compacted to a minimum of 92 percent relative compaction. Trenches shall be uniformly graded and prepared to provide a firm and uniform bearing for the entire length of the barrel of the pipe to be placed therein. Coupling or bell holes are required for all trenches to receive pipes or conduits with couplings or bells, and shall be excavated at each location where pipes are to be joined. Coupling or bell holes shall be of sufficient and of adequate size to permit ease in making the joint and so the coupling or bell does not rest on the bottom of the hole excavated therefor. Except for pipe bells and couplings, any portion of the trench excavated below the approved grade shall be corrected and brought up to grade with approved material and thoroughly compacted.

Trenches for structures such as manholes shall be over-excavated a minimum of 12 inches below the grade established for the bottom of the structure to a distance of 12 inches outside the limits of the structure base and then backfilled to the design bottom grade with granular non-expansive native material

meeting the requirements of these specifications and thoroughly compacted to a minimum of 92 percent relative compaction. Trenches shall be uniformly graded and prepared to provide a firm and uniform bearing for the entire length of the structure to be placed therein.

In all trenches or structure sites where a firm foundation is not encountered, such as soft, spongy, or otherwise unsuitable material, the material shall be removed a minimum depth of 2 feet or to a depth determined by the Engineer, below the normal bottom of the trench or structure excavation. The over-excavated space shall be backfilled with suitable material containing sufficient moisture to produce maximum compaction. The backfill material shall be free from lumps or other unsuitable material, and when compacted to the satisfaction of the Engineer, shall be finish graded as provided herein or as required by the Engineer for pipelines, conduits, or structures. No additional payment will be made for such additional excavation or backfill.

The width of the trench from the bottom to the top of the pipe or conduit shall be a minimum of 9 inches on either side of the pipe, or per the pipe manufacturer's recommendations. The maximum trench width shall be as approved by the Engineer. The Contractor shall make every effort to minimize the width of the trench at the top of the trench. Excessive trench widths, as determined by the Engineer, may require special trench and pipe backfill methods to counteract excessive pipe loads and provide a bond between backfill and trench walls. Reference is made to Sections 19-3.3A.2, "Final Backfill, Precast Pipe," and 19-3.3A.3, "Backfill, Cast-in-Place Pipe." In accordance with Section 6-8 "Samples and Tests," the City requires haunch compaction testing in trenches where pipes with an inner diameter of 24 inches or larger are being installed. The Contractor is responsible for planning construction means and methods appropriately and for providing safe access to City and testing staff to perform the required compaction testing in the pipe haunch and trench areas. No additional payment will be made for such special backfill methods for failure of the Contractor to exercise good construction practices to minimize trench widths.

Trenches for cast-in-place concrete pipe shall be graded and prepared to provide full, firm and uniform support by undisturbed earth or compacted fill throughout the bottom 220º of the pipe periphery.

The Contractor shall be responsible for drainage of trenches and other excavation areas, and such areas shall be kept as dry as practicable throughout the construction period. Pumping or other approved method shall be used to remove any accumulation of water. Trenches damaged because of failure to provide temporary drainage control shall be repaired or reconstructed at the Contractor's expense. The Contractor shall adhere to the provisions of Section 5-16, "Maintaining Drainage." No drainage water may be pumped or otherwise deposited in any sanitary sewer system, unless otherwise approved by the Engineer.

19-3.3 Trench and Structure Backfill and Compaction

Unless otherwise specified, material used for trench or structure backfill shall be granular non-expansive native material, free from debris, lumps, hardpan chunks, paving material, cobbles larger than 3 inches, or organic matter of other deleterious or unsuitable substances or it shall comply with Section 19-4.2, "Imported Borrow." Material shall be approved by the Engineer before use in the work.

A. Trench Backfill

Backfill of trenches shall conform to the Plans, Standard Drawings pertaining thereto, the Specifications, and the directions of the Engineer. Backfill for trenches in which precast pipe, including utility or communications conduits, has been installed shall be placed in two phases, classified as Initial Backfill and Final Backfill. No vibratory equipment shall be used to compact backfill until there is a minimum of 3 feet of cover over the initial backfill.

1. Initial Backfill, Precast Pipe, Conduit

After the bedding is prepared and the precast pipe or conduit has been laid to line and grade, Initial Backfill shall consist of placing by hand and firmly compacting selected granular native material under the haunches and up to the spring line of the pipe so as to form a firm bedding, and then filling with granular native material and compacting to a level 12 inches above the top of the pipe. The method of compacting and obtaining density requirements for initial backfill shall be such that the line and grade of the pipe is not disturbed and the pipe is not damaged. Backfill material shall be returned to the trench in lifts not to exceed 6 inches in depth (loose), and compacted. Jetting or flooding of Initial Backfill to completely fill the space under pipe haunches will not be permitted.

2. Final Backfill, Precast Pipe, Conduit

   Final Backfill for trenches in which precast pipe or conduit has been placed shall consist of placing and compacting backfill material into the remaining trench cavity following completion of initial backfill. Backfill material shall be returned to the trench in lifts not to exceed 8 inches in depth (loose), and compacted. Each lift shall be compacted the full depth of the lift prior to placement of the next lift of backfill material. Jetting or flooding of final backfill will not be permitted. In cases of excessive trench width, soil conditions, and soil type, as determined by the Engineer, to assure proper pipe load distribution and bonding between trench backfill and trench walls, the Contractor may be required by the Engineer to bench, plow, or scarify trench walls prior to placement of backfill. The cost for such trench wall treatment, if so required, shall be included in the price paid per linear foot of pipe. No additional payment will be made therefor.

3. Backfill, Cast-in-Place Pipe

   Backfill material for trenches in which cast-in-place concrete pipe has been constructed shall be returned to the trench in lifts not to exceed 8 inches in depth (loose), and compacted. Initial backfill efforts may proceed no sooner than 48 hours after construction of the pipe, except that compaction efforts using equipment which imparts load on the pipe or structures, shall not proceed for a minimum of seven (7) calendar days following placement of the pipe unless this requirement is specifically waived by the Engineer, or is otherwise specified. Each lift shall be compacted prior to placement of the next lift of backfill material. In cases of excessive trench width, soil conditions, and soil type, as determined by the Engineer, to assure proper pipe load distribution and bonding between trench backfill and trench walls, the Contractor may be required by the Engineer to bench, plow, or scarify trench walls prior to placement of backfill. The cost for such trench wall treatment, if so required, shall be included in the price paid per linear foot of pipe. No additional payment will be made therefor.

B. Structure Backfill

Structure backfill shall consist of placing and compacting backfill material around structures to the lines designated on the Plans or directed by the Engineer. Where cast-in-place structures are constructed, no backfill shall be placed until all forms are removed, all voids in the concrete properly filled, and the exterior of the structure has been inspected by the Engineer and approved for backfilling. Backfill material shall be placed in lifts not to exceed 8 inches in loose depth and compacted. Each lift shall be compacted prior to placement of the next lift of backfill material.

C. Slurry Cement Backfill

Where specified in the Plans or Contract Specifications, and as specified in Section 8-15, "Utility and Non-Street Facilities; Potholing," for backfill of small diameter excavations, slurry cement backfill shall be furnished and placed in conformance with this Section.

- Slurry cement backfill shall consist of a fluid, workable mixture of aggregate, cement and water.
- Slurry cement backfill may be used as structure backfill for pipes only where specifically approved by the Engineer in writing.
- When slurry cement backfill is used for structure backfill, the width of the excavation shown on the plans may be reduced so that the clear distance between the outside of the pipe and the side of the excavation, on each side of the pipe, is a minimum of 6 inches for pipes up to and including 42 inches in diameter or span, or one foot for pipes over 42 inches in diameter or span.
- Slurry cement backfill shall be placed only for that portion of the structure backfill below the original ground or the grading plane or the top of the embankment placed prior to excavating for the pipe. Where necessary, earth plugs shall be compacted at each end of the pipe prior to placing backfill in a manner that will completely contain the slurry in the pipe trench.
- Cement shall be portland cement conforming to the provisions in Section 50.
- Water used for slurry cement backfill shall be free from oil, salts and other impurities which would have an adverse effect on the quality of the backfill material.
- At the option of the Contractor, aggregate shall be either (1) material selected from excavation, imported material or a combination thereof, which is free of organic material and other deleterious substances, or (2) commercial quality concrete sand. Material selected from excavation, imported material or a combination thereof, shall meet the following grading:

Sieve Sizes	Percentage Passing
1 1/2"	100
1"	80 - 100
3/4"	60 - 100
3/8"	50 - 100
No. 4	40 - 80
No. 100	10 - 40

- The aggregate, cement and water shall be proportioned either by weight or by volume. Not less than 188 pounds of cement shall be used for each cubic yard of material produced. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed.
- Materials for slurry cement backfill shall be thoroughly machine mixed in a pugmill, rotary drum, or other approved mixer. Mixing shall continue until the cement and water are thoroughly dispersed throughout the material. Slurry cement backfill shall be placed in the work within one hour after mixing.
- Slurry cement backfill shall be placed in a uniform manner that will prevent voids in, or segregation of, the backfill, and will not float or shift the pipe. Foreign material which falls into the trench prior to or during placing of the slurry cement backfill shall be immediately removed.
- Backfilling over or placing any material over slurry cement backfill shall not commence until 4 hours after the slurry cement backfill has been placed, except that when concrete sand is used for the aggregate and the in place material is free draining, backfilling may commence as soon as the surface water is gone.

D. Pervious Backfill Material

Where specified in the Plans or Contract Specifications, Pervious Backfill Material shall be furnished and placed in conformance with plans and this Section.

- Pervious backfill material shall be placed behind bridge abutments, wingwalls and retaining walls as shown on the plans and in accordance with the following requirements.
- Pervious backfill material shall consist of gravel, crushed gravel, crushed rock, natural sands, manufactured sand or combinations thereof. Pervious backfill material, except for sacked material at wall drain outlets, shall conform to the following grading requirements:

Sieve Sizes	Percentage Passing
2"	100
No. 50	0 - 100
No. 100	0 - 8
No. 200	0 - 4

- Wall drain outlets shall be backed with sacked pervious backfill material, except that the grading for the sacked material shall conform to the grading for the 1-1/2" x 3/4" primary aggregate size specified in State Standard Specification Section 90-1.02C(4)(b), "Coarse Aggregate Grading."

- Pervious backfill material shall be placed in layers along with and by the same methods specified for structure backfill. Pervious backfill material at any one location shall be approximately the same grading, and at locations where the material would otherwise be exposed to erosion shall be covered with at least a one foot layer of earthy material approved by the Engineer.

E. Compaction

Compaction shall conform to the requirements of Section 6-9, “Compaction Tests,” and the applicable Standard Drawings for Trench Backfill/Patch Paving and Resurfacing. All trench and structure backfill, including that for utility or communications conduit whether installed under City Contract or Encroachment Permit, shall be compacted to a relative compaction of not less than 92 percent to within 24 inches of the bottom of the planned structural pavement surfacing section of trench resurfacing, or roadway structural section if the trench or structure is located in a roadway to be reconstructed as part of the work, or the ground surface when the trench or structure is located in an unimproved area. The upper 24 inches of trench and structure backfill as defined in the previous sentence shall be compacted to a relative compaction of not less than 95 percent within the roadway. In landscape areas the top 24 inches of the trench shall be compacted to not less than 85 percent.

For trenches or areas around structures that are to receive an improved surface, the compacted backfill shall be brought to a smooth and level condition so as to receive the full thickness of surfacing. Where the trench or area around a structure is not to be resurfaced, the surface of compacted backfill shall be brought to a smooth condition even with adjacent undisturbed soil. The surface of the finished backfill in all areas shall be made even and uniform, free from depressions or raised areas.

Excess material resulting from backfill and compaction of trenches and structures not used in the work shall be disposed of outside the right-of-way as set forth in Section 5-12, “Disposal of Material Outside the Right of Way,” at the Contractor’s expense.

F. Imported Borrow

If imported borrow material is required to backfill trenches or excavations, the Contractor shall, at his expense, make his own arrangements for obtaining imported borrow and pay all costs

involved. Imported borrow shall be of a quality suitable for the purpose intended, free of vegetable matter or other unsatisfactory material, and shall have a minimum R- value of 40 as determined from tests conducted in accordance with Section 6-8, "Samples and Tests." Selected material from excavation or imported borrow material having a Sand Equivalent value less than 10 shall not be placed within 2.5 feet of finished grade and shall be placed in the lower portions of embankments. Large rocky material, including rocks, broken concrete or other solid materials, or hard lumps such as hardpan or cemented gravel, which cannot be broken readily shall not be used in trenches and excavations. All imported borrow shall meet the requirements of Section 19-4.2 "Imported Borrow," and shall be subject to the approval of the Engineer. The Contractor shall supply to the City, at the Contractor's expense, test results required by the Engineer to determine the suitability of any borrow proposed for import. These tests, which are to be representative of the material delivered to the site, will be required at the original site of the proposed borrow material and also at the delivery site. The Contractor shall remove, at the Contractor's expense, any borrow placed which fails to meet the approval of the Engineer.

G. Water

The use of water in the work shall comply with the requirements of Section 5-13, "Electric and Water Service," and Section 17, "Water Use." The Contractor shall obtain the permission of the California Water Service Company as to which fire hydrants are to be utilized. Jetting of trench backfill is not allowed. Flooding of trenches from the top is not permitted.

19-3.4 Progress of Work, Trench and Structure Excavation, Backfill

All work of excavation and backfilling shall be done as quickly as possible.

Where trench or structure excavation is to occur in an area with improved surfacing, the existing surfacing at any location shall be removed no sooner than 48 hours prior to excavation at that location. No surfacing shall be removed on Friday unless excavation and follow-up work will occur the same day.

Unless authorized in writing by the Engineer, no more than 100 feet of trench in business and commercial districts or 300 feet of trench in all other areas shall be excavated at any location ahead of any preceding trench which has not received pipeline or other conduit and backfilled.

No excavation or trench shall be opened and left open more than 24 hours before: a) the installation of the pipeline or other conduit which is to be placed in said trench; b) the start of construction of a structure in said excavation. The backfilling of said excavation or trench shall be completed within twenty four hours after the installation of the facility for which the excavation was made, except for cast-in-place pipe installations and that portion of trenches or excavations to be used for connecting the extension of the installation, provided said portion is adequately barricaded and protected, and backfilled the following working day. All trenches that remain open at the end of the work day shall be plated in accordance with City Encroachment Permit Policy Manual and Standard Drawing requirements.

Backfill for cast-in-place concrete pipe shall be accomplished as soon as practicable but shall comply with the timing requirements of Section 19-3.3A.3, "Backfill, Cast-in-Place Pipe." Trenches shall be adequately barricaded and access shall be provided for abutting properties and street intersections.

Unless otherwise specified in the Contract Specifications or authorized in writing by the Engineer, where an excavation or trench crosses a street intersection, the excavation, installation, and backfill or bridging shall be conducted in a manner such that the street shall remain open at all times. Alleys may be closed only with written approval from the Engineer, but shall be reopened at the end of the work day.

All excavations located within a street or alley for the purpose of boring or jacking pits shall be properly barricaded and protected, and may be left open for a period of not more than seven (7) calendar days, unless an extension of time is approved by the Engineer in writing.

Immediately after trenches or other excavations have been backfilled and preliminarily compacted in streets or alleys, temporary surfacing shall be placed in conformance with Section 19-3.5, "Restoration of Surfaces," and in accordance with the Plans, Standard Drawings, and Contract Specifications therefor.

19-3.5 Restoration of Surfaces

For trench or structure excavations located in existing paved areas not to be reconstructed as part of the work, final pavement replacement shall be accomplished as soon as possible and practicable, but in no case later than the time limits specified in these Specifications.

Restoration of surfaces shall consist of restoring the surfaces (resurfacing) of all trenches and surfaces at or around structure sites, or any other surfaces damaged or disturbed by the work. Surfaces shall include pavement of any kind including asphalt concrete and portland cement concrete and paving stones, grass, shrubbery or other landscaping, gravel, treated or untreated soil, etc. All work shall be done in accordance with the Plans, Standard Drawing, and the Specifications.

Temporary Trench Resurfacing shall comply with these Specifications and shall be placed and diligently maintained by the Contractor until permanent trench resurfacing is installed. Temporary pavement shall consist of a minimum of 2 inches of temporary asphalt concrete pavement (cutback or cold mix asphalt) and shall be placed immediately following backfilling activities. This temporary pavement shall be maintained in a safe and reasonably smooth condition until required backfill compaction is obtained and final pavement replacement is completed. Temporary surfacing shall be required to be in place whenever the road is opened to vehicular traffic. Temporary surfacing shall be placed in all streets and alleys, and such other locations as specified or shown on the Plans, or directed by the Engineer. Temporary surfacing shall be removed and disposed of by the Contractor prior to placing final resurfacing.

The maximum length of time that temporary trench resurfacing shall remain in paved areas shall be 21days in collector and arterial streets and 42 days in residential streets, unless approved otherwise in writing by the Engineer. Prior to the end of these periods the Contractor shall complete the Final Trench Resurfacing.

Final Trench Resurfacing, replacement of pavement section including subbases, aggregate bases, and hot mix asphalt, shall be performed in a manner consistent with good construction practices and methods which, when completed, shall leave all areas requiring replacement of pavement with a neat and clean appearance. Areas to receive final pavement replacement shall be completely cleaned of all debris, rubbish, dirt, temporary paving, or any other deleterious material which might affect the quality of the work in any way. Cleaning shall be accomplished to a minimum of 6 feet outside the edges of trenches or other areas to receive pavement replacement. This distance may be increased by the Engineer as necessary to prevent contamination of the new work.

All sawcutting and final pavement replacement section construction shall be completed in accordance with the Plans, Standard Drawings, Specifications and Contract Documents.

Where sawcutting of existing pavement edges is not shown on the standard drawing or specified, all damaged existing pavement shall be removed and the edges trimmed to neat lines as directed by the Engineer and by a method approved by the Engineer.

Where sawcutting of existing pavement edges is shown on the standard drawing or is specified, the cut shall be made on a straight line along both sides of trenches, and to neat lines around structures or other locations requiring pavement replacement. The full depth cut shall be made and shall encompass all pavement damaged by the work or specified to be removed or replaced.

The Contractor shall notify the Inspector a minimum of 2 working days prior to sawcutting or trimming operations begin to arrange a site walk through to define the required sawcutting/trimming limits.

All edges of existing pavement, whether trimmed or sawcut, shall be protected from damage. Any edges damaged from any cause prior to or during paving operations, shall be re-cut or re-trimmed as directed by the Engineer. No additional payment will be made therefor.

Where Aggregate Base is specified to be used as part of the resurfacing structural section or backfill, it shall be furnished and placed in conformance with Section 26, "Aggregate Bases," of these Specifications.

Where Portland Cement Concrete is specified to be used as part of the resurfacing structural section or backfill, unless otherwise specified on the Plans or in the Contract Specifications, it shall be Class 2 or 3 as noted on the Plans, Standard Drawings, and these Specifications with 1 inch maximum aggregate, conforming to the requirements of Section 50, "Portland Cement Concrete," of these Specifications. The top surface of the concrete shall be given the appropriate finish based on the improvement type while the mix is still workable.

A paint binder of asphaltic emulsion shall be furnished and applied, in conformance with Section 28 "Hot Mix Asphalt" of these Specifications, to all vertical or other surfaces of existing pavement, curbs, gutters, or other surfaces against which asphalt-concrete pavement is to be placed.

HMA shall be furnished and placed in conformance with Section 28, "Hot Mix Asphalt," of these Specifications. When replacing pavement in existing paved areas, the new pavement shall be placed in accordance with the Plans, Standard Drawings, and Contract Documents therefor which shall apply to replacing pavement around structures as well as within trenches. The Contractor shall not commence surface paving until the subbase and/or base have been inspected, tested and approved. Violation of this requirement shall be cause for rejection of that portion of paving involved.

When compacted, the new asphalt pavement edge shall be one-eighth of one inch (1/8") to one-quarter of one inch (1/4") higher than the existing pavement and edges of adjacent concrete improvements where applicable, except at curb returns where the new pavement edge shall be flush at all accessibility ramp landings. The surface shall be smooth, without humps or depressions. Except where the trench is located in the crown of the road, the top of the finished surfacing shall deviate no more than one-quarter of one inch (1/4") higher, and in no case lower, than a line struck off from two points on the existing road surface, one on each side of the trench. Deviation from this tolerance shall be cause for rejection of the surfacing. The Contractor shall be responsible for removing and re-constructing the trench surfacing that does not meet these tolerances at his own expense.

All cuts in existing pavement that is less than eight years old, or as directed by the City Engineer, shall be required to have seamless joints with the existing pavement by using an approved heater-remix process.

Restoration of miscellaneous surfaces shall consist of replacing or restoring in-kind any surface damaged or disturbed by the work, including but not limited to, grass, landscaping of any kind, gravel, oiled dirt, concrete, or soil, all as directed by the Engineer. The surfaces of all trenches, excavations, existing streets

or other areas damaged or disturbed by the work, upon completion of miscellaneous surface restoration, shall conform to the elevations and character of the areas which existed before work commenced.

In all cases regardless of surface material or type, all existing or new facilities shall be brought to the finish grade of that surface in compliance with Section 15-2.5A, "Frames, Covers, Grates, Manholes." The interior of the existing or new facilities shall be thoroughly cleaned of all debris or dirt, regardless of whether the debris or dirt was present before construction began.

Restoration of surfaces shall comply with Sections 4-13, "Interim Cleanup," 5-20, "Surface Restoration," and 5-21, "Final Cleanup."

19-3.6 Measurement

Trench and structure excavation will not be measured as it is to be included in the work requiring such excavation and backfill. Unless otherwise provided in the Contract Specifications, measurement of Slurry Cement Backfill or Pervious Backfill Material used for trench backfill shall be by lineal foot as measured along the centerline of trench in which such backfill was placed.

Measurement for Temporary or Final Trench Resurfacing will be by the lineal foot as measured along the centerline of the actual trench resurfaced, unless otherwise indicated in the Plans and/or Contract Specifications. The Temporary and Final Trench Resurfacing bid items only apply to the length of trench located in the existing City street pavement section between the lips of curb and gutters or from edge of pavement to edge of pavement in streets with no curb and gutter. Regardless of composition or combination of materials used in trench resurfacing, measurement will be as though only one material is used. Temporary or Final Trench Resurfacing outside of the existing City street pavement limits defined in this paragraph shall be considered restoration of miscellaneous surfaces and no measurement will be made, as no separate payment will be made therefor. Measurement of resurfacing around structures will not be made, as no separate payment will be made therefor.

Temporary and Final Trench Resurfacing for conduit and other items installed in accordance with Section 45 "Signals, Lighting, and Electrical Systems," will not be made, as no separate payment will be made therefor.

Unless otherwise specified in the Contract Specifications, restoration of miscellaneous surfaces for trenches or structures will be included in the cost of the various items of work to which the work relates, and no measurement will be made.

Measurement of facilities raised to grade shall be in accordance with the contract item therefor. In the absence of a contract item(s) for the measurement and payment of raising existing and/or new facilities to grade within the trench surface restoration area, no measurement will be made, and payment therefor shall be included in the various items of work to which the work relates.

19-3.7 Payment

Except for Slurry Cement Backfill and Pervious Backfill Material, payment for trench and structure excavation, backfill and compaction, importing material, exporting material, removal and disposal of materials, maintaining and covering trenches, trench plating, including any benching, plowing, or scarifying required by the Engineer shall be included in the amount bid for installing the pipe, conduit, structure or other facility to be installed in such trench, structure or other excavation. Payment shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals including water, and for doing all the work involved as shown on the Plans, as set forth in these Specifications, the Contract Specifications, and as directed by the Engineer.

The unit price bid per lineal foot for Slurry Cement Backfill and Pervious Backfill Material shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved as shown on the Plans, as set forth in these Specifications, the Contract Specifications, and as directed by the Engineer.

Unless otherwise provided in the Contract Specifications, the unit price bid per lineal foot for Final Trench Resurfacing shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans and Standard Drawings, as set forth in these Specifications, the Contract Specifications, and as directed by the Engineer, including, but not limited to, sawcutting or trimming existing pavement edges, removal and disposal of the existing pavement section, clean up preparation for final trench resurfacing, application of tack coat, installing the final trench resurfacing section (full structural section including subgrade preparation, AS, AB, HMA or Concrete) complete and in place, and providing seamless joints with the existing pavement where required. Payment for Final Trench Resurfacing around structures, sawcutting the existing pavement around structures, removal and disposal, and installation of final trench resurfacing, and providing seamless joints with the existing pavement where required shall be included in the price paid for the structure involved, not in the Final Trench Resurfacing bid item.

Unless otherwise provided in the Contract Specifications, the unit price bid per lineal foot for Temporary Trench Resurfacing shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans and Standard Drawings, as set forth in these Specifications, the Contract Specifications, and as directed by the Engineer, including maintaining temporary surfacing and removing it prior to final resurfacing, hauling, and disposal. Payment for Temporary Trench Resurfacing around structures including removal and disposal shall be included in the price paid for the structure involved, not in the Temporary Trench Resurfacing bid item.

When the Contract does not include a pay item for Temporary or Final Trench resurfacing as above specified, and unless otherwise provided in the Contract Specifications, full compensation for any necessary temporary or final trench resurfacing including required sawcutting shall be considered as included in the prices bid for the various bid items to which the work relates and no separate payment will be made therefor.

Temporary and Final Trench Resurfacing for conduit and other items installed in accordance with Section 45 “Signals, Lighting, and Electrical Systems,” shall be included in the costs for the various bid items to which the work relates under said Section 45 and shall not be included in the Temporary Resurfacing or Final Trench Resurfacing bid items.

Unless otherwise provided in the Contract Specifications, full compensation for restoration of miscellaneous surfaces shall be considered as included in the price bid for the various items of work and no separate payment will be made therefor.

19-4 Embankment Construction

19-4.1 General

Embankment construction shall consist of constructing roadway embankments, including the preparation of the areas upon which embankment materials are to be placed; the construction of temporary surcharge embankment above the grading plane; the construction of earthen dikes within or outside the right of way; the placing and compacting of approved material within the areas to receive embankment where unsuitable material has been removed; and the placing and compacting of embankment material in holes,

pits and other depressions within the area to receive embankment. Embankment material shall be either selected material conforming to Section 19-2.6, “Selected Material,” or imported borrow conforming to Section 19-4.2, “Imported Borrow.”

19-4.2 Imported Borrow

The Contractor shall, at his expense, make his own arrangements for obtaining imported borrow and pay all costs involved. Imported borrow shall be of a quality suitable for the purpose intended, free of vegetable matter or other unsatisfactory material, and shall have a minimum R- value of 40 as determined from tests conducted in accordance with Section 6-8, “Samples and Tests.” Selected material from excavation or imported borrow material having a Sand Equivalent value less than 10 shall not be placed within 2.5 feet of finished grade and shall be placed in the lower portions of embankments. Clods or hard lumps of earth over 8 inches in greatest dimension shall be broken up before compacting the material in embankment. Large rocky material, including rocks, broken concrete or other solid materials, or hard lumps such as hardpan or cemented gravel, which cannot be broken readily shall not be used in embankments. All imported borrow shall be subject to the approval of the Engineer and should consist of non-expansive, inorganic granular soils conforming to the following criteria:

IMPORTED BORROW	
Maximum Plasticity Index	8
Maximum Particle Size (inches)	3
Percentage Passing #200 Sieve	0-40
Sand Equivalent	20 Minimum
Maximum Water Soluble Sulfate (SO_4) in Soil, percent by weight	0.2

The Contractor shall supply to the City, at the Contractor's expense, test results required by the Engineer to determine the suitability of any borrow proposed for import. These tests, which are to be representative of the material delivered to the site, will be required at the original site of the proposed borrow material and also at the delivery site. The Contractor shall remove, at the Contractor's expense, any borrow placed which fails to meet the approval of the Engineer.

19-4.3 Placing

Where shown in the Plans or specified in the Contract Specifications, the Contractor shall provide excavation, grading, placement and compaction for the construction of roadway embankment from approved surplus excavated material (selected material) or from Imported Borrow, to the line, grade and cross-section shown on the Plans, or as directed by the Engineer. Unsuitable surplus excavated material shall be disposed of by the Contractor in accordance with Section 5-12, "Disposal of Material Outside the Right of Way.” If the quantity of selected material is not sufficient to construct the embankments required by the Plans, the quantity of material needed to complete the embankments shall consist of Imported Borrow.

Embankments shall be constructed in layers. The loose thickness of each layer of embankment material before compaction shall not exceed 8 inches. Areas to receive embankment construction shall first be cleared of all debris, bushes, weeds, stumps, or other deleterious material, in accordance with Section 16, “Clearing and Grubbing.” If embankment material is to be placed on existing slope areas, the existing surface shall be benched, plowed, or scarified in accordance with the plans or as directed by the Engineer to produce a bond with the material to be placed.

Attention is directed to Section 19-4.4, "Compacting." Where embankment is to be made and compacted on slopes or where new embankment is to be compacted against existing embankments or where embankment is built one half width at a time, the original slopes and old or new embankments shall be cut into a minimum of 3 feet horizontally as the work is brought up in layers. Material thus cut out shall be re-compacted along with the new embankment material at the Contractor's expense.

Where embankment is to be made and compacted on original slopes, old or new embankments, and end dumping is permitted, the slopes of the original ground or embankment shall be benched, plowed or cut into before starting end dumping.

When embankment is to be placed on an existing roadway, the existing roadbed shall be scarified, watered, graded and rolled in advance of placing new material thereon.

The construction of earthen dikes, the placing and compacting of approved material within the right of way where unsuitable material has been removed, and the filling of holes, pits and other depressions within the right of way, shall conform to the provisions herein and in conformance with the provisions in said Section 19-4.4. Trenches, holes, depressions and pits outside of areas where embankments are to be constructed shall be graded to provide a presentable and well drained area.

Embankments shall be maintained to the grade and cross section shown on the plans until the acceptance of the contract.

19-4.4 Compacting

Embankments shall be constructed in layers of uniform thickness as specified in Section 19-4.3, "Placing." Each layer shall be compacted to a relative compaction of not less than 92 percent, except that any layer within 2.5 feet of finish grade shall be compacted to a relative compaction of not less than 95 percent.

Sidehill embankments, where the width including bench cuts for bonding existing and new embankments is too narrow to accommodate compacting equipment, may be constructed by end dumping if permitted by the Engineer, until the embankment, including benching, is wide enough to permit the use of compacting equipment, after which the remainder of the embankment shall be placed in layers and compacted as specified.

At the time of compaction, the moisture content of embankment material shall be such that the specified relative compaction will be obtained and the embankment will be in a firm and stable condition. Embankment material which contains excessive moisture shall not be compacted until the material is dry enough to obtain the required compaction. Full compensation for any additional work involved in drying embankment material to the required moisture content shall be considered as included in the contract price paid for excavating or furnishing the material and no additional compensation will be allowed therefor.

Any subsequent trenching through completed embankments, including trenching for utility or communications conduits, shall comply with Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration." The Contractor shall assure that others doing work within the area under the control of the Contractor comply with this requirement.

19-4.5 Measurement

Embankment Construction will be measured on a lump sum basis. Where embankment construction is included as backfill for other contract items of work, no measurement will be made.

Any quantities shown on the plans or on the bid item schedule for Embankment Construction are considered approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding.

19-4.6 Measurement & Payment

Embankment construction shall include furnishing all labor, materials, equipment and incidentals and performing all work required for clearing, subgrade preparation for placing embankment, including placing and compacting approved material where unsuitable and unstable embankment foundation material has been removed, benching, plowing, or scarifying as required, excavation, hauling, obtaining imported borrow, placing and compacting local or imported borrow, exporting material and finish grading to the lines and grades shown on the Plans and specified in the Specifications.

Embankment construction will be paid for under the lump sum price paid for Roadway Excavation or the lump sum price paid for Import Material in accordance with Section 19-2.8 "Measurement & Payment." Any work related to importing material required to construct the embankments complete and in place shall be include in the lump sum price paid for Import Material under Section 19-2.8. All other earthwork required to construct the embankment complete and in place that is not involved with importing material shall be included under the lump sum price paid for Roadway Excavation under Section 19-2.8.

Filling and compacting holes, pits and other depressions, backfilling excavations resulting from the removal of structures and other facilities, or replacement of unsuitable material will be paid for in accordance with Section 15, "Removing Existing Facilities," Section 16, "Clearing and Grubbing," and Section 19-2.7, "Subgrade Preparation, Compaction."

SECTION 20 LANDSCAPE CONSTRUCTION SYSTEMS

20-1 General

All materials used and work performed for Landscape Construction Systems shall be done in accordance with the City of Visalia Landscape Standard Specifications, hereinafter referred to as Landscape Specifications, the City of Visalia Landscape Standard Plans, hereinafter referred to as Landscape Standard Plans, these Specifications, Plans and other Contract Documents. The Landscape Specifications and Landscape Standard Plans are incorporated into these specifications and Contract Documents by virtue of reference. The Contractor may obtain a copy of said documents from the City's website at the following address: http://www.ci.visalia.ca.us/depts/parks_n_recreation/urban_forestry/default.asp or by contacting the Urban Forestry Department at (559) 713-4384.

20-2 Measurement

Landscape Construction Systems will be measured on a lump sum basis unless noted otherwise in the Plans, Special Provisions, or other Contract Documents.

20-3 Payment

The lump sum price paid for Landscape Construction Systems shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in Landscape Construction Systems as shown on the Plans, set forth in the Landscape Specifications and Landscape Standard Plans, these Specifications, the Contract Documents, and as directed by the Engineer unless noted otherwise in the Plans, Special Provisions, or other Contract Documents.

Where no bid item for Landscape Construction Systems is provided, all costs for providing Landscape Construction Systems shall be included in the various bid items of work; no additional payment will be made therefor.

SECTION 21 (RESERVED)

SECTION 22 FINISHING ROADWAY

22-1 General

Section 22 includes specifications for finishing the roadway. Perform finishing activities after completing all other construction activities.

22-2 Materials

Not Used

22-3 Construction

Trim and shape graded areas without surfacing to smooth and uniform cross sections and slopes:

A. Between edge of shoulder and hinge point of slopes

B. At medians

For a graded roadbed without surfacing or pavement, trim and shape the entire roadbed to uniform cross sections and slopes.

Trim slopes of gutters without lining or surfacing to the required grade and cross section.

Do not stockpile material on finished pavement or allow material to drift across pavement. Clean finished pavement of dirt and foreign material.

Clear debris and obstructions from ditches and channels constructed under the Contract.

Clean out sewers, culverts, and other drainage facilities and appurtenant structures constructed under the Contract.

Remove debris and excess material next to culverts, headwalls and endwalls, bridge ends, poles, posts, trees, or other objects and leave in a neat and orderly condition.

Remove from slopes any exposed material that might become loose such as rocks and roots.

Remove loose rock larger than 2-1/2 inches in maximum dimension from:

A. Between edge of shoulder and hinge point of slopes

B. At medians

C. Finished roadbed

Dispose of material resulting from finishing activities.

22-4 Payment

Not Used

SECTION 23 (RESERVED)

SECTION 24 (RESERVED)

SECTION 25 AGGREGATE SUBBASES

25-1 General

Section 25 includes specifications for furnishing, spreading and compacting Aggregate Subbases (AS). This Section has been copied from State Standard Specifications Section 25 "Aggregate Subbases" and has been modified for use in the City of Visalia

25-2 Materials

25-2.1 General

Aggregate for Class 1, 2, and 3 AS must be clean and consist of any combination of the following:

A. Broken stone

B. Crushed gravel

C. Natural rough surfaced gravel

D. Sand

E. Reclaimed processed asphalt concrete, portland cement concrete (PCC), lean concrete base (LCB), or cement treated base (CTB).

When recycled materials listed under section 25-2.1E are being used in any mix, the Contractor shall have the material provider stockpile the materials for the project at the manufacturing site for materials testing. After these materials have been deemed acceptable for use on the project, the materials in this stockpile shall be the only materials used at the project site.

25-2.2 Class 1, Class 2, and Class 3 Aggregate Subbases

When tested under California Test 202, aggregate must comply with the grading requirements for the sieve sizes shown in the following table:

Aggregate Grading

Sieve size	Percentage passing					
	Class 1		Class 2		Class 3	
	Operating range	Contract compliance	Operating range	Contract compliance	Operating range	Contract compliance
3"	100	100	100	100	100	100
2 1/2"	90–100	87–100	90–100	87–100	90–100	87–100
No. 4	35–70	30–75	40–90	35–95	50–100	45–100
No. 200	0–20	0–23	0–25	0–29	0–30	0–34

Aggregate must comply with the quality requirements for the classes shown in the following table:

Aggregate Quality

Property	California Test	Class 1		Class 2		Class 3	
		Operating range	Contract compliance	Operating range	Contract compliance	Operating range	Contract compliance
Sand equivalent (min)	217	21	18	21	18	21	18
Resistance (R-value) (min)	301	--	60	--	50	--	40

If the aggregate grading test results, the sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing AS for the remainder of the work day. Do not place additional AS until you demonstrate to the Engineer the AS to be placed complies with the operating range requirements.

If the aggregate grading test results, sand equivalent test results, or both do not comply with contract compliance requirements, remove the AS or request a payment deduction. If your request is authorized, $2.00/CY is deducted for each noncompliant test result. An aggregate grading and a sand equivalent test represents up to (1) 500 CY or (2) 1 day's production if less than 500 CY.

25-3 Construction

25-3.1 General

Water AS under section 17.

25-3.2 Subgrade

Immediately before spreading the AS, the subgrade must comply with the specified compaction and elevation tolerance for the material involved and be free from loose or extraneous material.

Areas of the subgrade lower than the grade established by the Engineer may be filled with AS. AS used to fill low areas of the subgrade is not included in the quantity for payment.

25-3.3 Spreading

Deliver uniform mixtures of AS to the roadbed. Deposit AS in layers or windrows. Spread and shape the AS to such thickness that after watering and compacting, the completed AS is within the tolerances specified. When AS is spread and compacted the moisture content must be uniform and sufficient to obtain the required compaction. Avoid material segregation. AS must be free from pockets of coarse or fine material.

Where the subgrade is cohesionless sand and if authorized, you may dump AS in piles and spread it ahead in sufficient quantities to stabilize the subgrade.

Where the shown subbase thickness is 0.50 foot or less you may spread and compact the AS in one layer.

Where the shown thickness is more than 0.50 foot, spread and compact in 2 or more layers approximately equal in thickness. The compacted thickness of any one layer must not exceed 0.50 foot. At locations inaccessible to spreading equipment, spread and compact AS by any means that will produce the specified results.

25-3.4 Compacting & Quality Control

Compact each AS layer to at least 95 percent relative compaction.

The finished surface of AS must not vary by more than 0.04 foot above or below the grade established by the Engineer.

Correct areas of AS that do not comply with the thickness shown or request a payment deduction. If your request is authorized, the Engineer calculates the deduction by multiplying:

A. Deficient thickness less allowable tolerance

B. Planned width

C. Longitudinal distance of the deficient thickness

D. $11.00/cu yd

Prior to placing any base materials on the subbase, the subbase shall be proof-rolled with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in the direction of travel parallel with the roadway. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle truck or water truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer or Inspector, and replace with compacted backfill or fill as directed.

Proceed with placement of base materials only after unsatisfactory conditions have been corrected.

25-4 Measurement & Payment

Payment for Aggregate Subbase shall be at the contract unit price per cubic yard as calculated from the dimensions shown on the Plans, and shall include full compensation for furnishing labor, materials, tools, equipment and incidentals for doing all work involved for Aggregate Subbase complete and in place as shown on the Plans and as specified in these Specifications and as directed by the Engineer, and no additional compensation will be allowed therefor.

SECTION 26 AGGREGATE BASES

26-1 General

Section 26 includes specifications for Aggregate Base (AB) materials and spreading and compacting, AB. All aggregate base used on City of Visalia projects shall be Class 2 Aggregate Base in accordance with the requirements of this Section 26. This Section has been copied from the State Standard Specifications Section 26 "Aggregate Bases" and has been modified for use in the City of Visalia.

26-2 Materials

26-2.1 General

Aggregate for Class 2 AB must be clean and consist of any combination of the following:

A. Broken stone

B. Crushed gravel

C. Natural rough surfaced gravel

D. Sand

E. Processed reclaimed asphalt concrete, portland cement concrete (PCC), lean concrete base (LCB), or cement treated base (CTB)

When recycled materials listed under section 25-2.1E are being used in any mix, the Contractor shall have the material provider stockpile the materials for the project at the manufacturing site for materials testing. After these materials have been deemed acceptable for use on the project, the materials in this stockpile shall be the only materials used at the project site.

Use 3/4 inch aggregate grading unless approved otherwise by the Engineer. Do not change your selected aggregate grading without authorization.

Aggregate for bases shall be clean from vegetable matter and other deleterious substances, and shall be of such nature that it can be readily compacted under watering and rolling to form a firm, stable base.

Existing aggregate base shall not be re-used in the new project improvements unless specifically approved by the Engineer in writing. The Contractor will be responsible for all testing costs associated with verifying that the existing aggregate meets the requirements of the specifications.

If the aggregate grading test results, sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing AB for the remainder of the work day. Do not place additional AB until you demonstrate to the Engineer the AB to be placed complies with the operating range requirements.

If the aggregate grading test results, sand equivalent test results, or both do not comply with contract compliance requirements, remove the AB or request a payment deduction. If your request is authorized, $2.00/CY is deducted. If AB is paid by weight, the Engineer converts tons to cubic yards for the purpose of reducing payment for noncompliant AB left in place. An aggregate grading and a sand equivalent test represents up to (1) 500 CY or (2) 1 day's production if less than 500 CY. If the request is not authorized, the AB shall be removed and replaced at the Contractor's expense.

26-2.2 Class 2 Aggregate Base

When tested under California Test 202, aggregate must comply with the grading requirements for the sieve sizes shown in the following table:

Aggregate Grading

Sieve sizes	Percentage passing			
	1-1/2 inch maximum		3/4 inch maximum	
	Operating range	Contract compliance	Operating range	Contract compliance
2"	100	100	--	--
1-1/2"	90–100	87–100	--	--
1"	--	--	100	100
3/4"	50–85	45–90	90–100	87–100
No. 4	25–45	20–50	35–60	30–65
No. 30	10–25	6–29	10–30	5–35
No. 200	2–9	0–12	2–9	0–12

Aggregate must comply with the quality requirements shown in the following table:

Aggregate Quality

Property	California Test	Operating range	Contract compliance
Resistance (R-value) (min)	301	--	78
Sand equivalent (min)	217	25	22
Durability index (min)	229	--	35

Aggregate samples must not be treated with lime, cement, or chemicals before testing for durability index. Aggregate from untreated reclaimed processed asphalt concrete, PCC, LCB, or CTB is not considered treated.

26-3 Construction

26-3.1 General

Water AB under section 17.

26-3.2 Subgrade

Immediately before spreading AB, the subgrade or aggregate subbase must comply with the specified compaction and elevation tolerance for the material involved and be free from loose or extraneous material.

If the subgrade or AS areas are lower than the grade established by the Engineer they must be filled with subgrade or AS materials prior to the placement of AB.

26-3.3 Spreading

Deliver uniform mixtures of AB to the roadbed. Deposit AB in layers or windrows. Spread and shape the AB to such thickness that after watering and compacting, the completed AB is within the tolerances specified in Section 26-3.4. When AB is spread and compacted the moisture content must be uniform and

sufficient to obtain the required compaction. Avoid material segregation. AB must be free from pockets of coarse or fine material.

Where the subgrade is cohesionless sand you may dump AB in piles and spread it ahead in sufficient quantities to stabilize the subgrade, if authorized by the Engineer.

Where the shown AB thickness is 0.50 foot or less you may spread and compact the AB in one layer. Where the shown thickness is more than 0.50 foot, spread and compact in 2 or more layers approximately equal in thickness. The compacted thickness of any one layer must not exceed 0.50 foot. At locations inaccessible to spreading equipment, spread and compact AB by any means that will obtain the specified results.

Any soft, spongy or otherwise unstable areas shall be repaired by completely removing the material and replacing it with acceptable materials in accordance with these Specifications.

26-3.4 Compacting & Quality Control

Compact each AB layer to at least 95 percent relative compaction under ASTM D1557.

The finished surface of AB must not vary by more than 0.02 foot above or below the grade established by the Engineer.

Correct areas of AB that do not comply with the described thickness or request a payment deduction if AB is paid for by volume. If AB is paid by weight, the Engineer converts tons to cubic yards for the purpose of reducing payment for noncompliant AB left in place. If your request is authorized, the Engineer calculates the deduction by multiplying:

A. Deficient thickness less allowable tolerance
B. Planned width
C. Longitudinal distance of the deficient thickness
D. $17.00 per cubic yard or the item bid price adjusted for cubic yards, whichever is higher

Prior to placing any surfacing materials on the AB, the AB shall be proof-rolled with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated base material.

1. Completely proof-roll base in the direction of travel parallel with the roadway. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle truck or water truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer or Inspector, and replace with compacted base or as directed.

Proceed with placement of surfacing materials only after unsatisfactory conditions have been corrected.

26-4 Measurement & Payment

Payment for Class 2 AB shall be at the contract unit price per ton. The contract price paid for Class 2 AB shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in hauling, placing, grading, compaction and watering, and constructing

aggregate base, complete in place as shown on the plans and as specified in the Specifications, and as directed by the Engineer. Quantities shall be measured in accordance with the provisions of these specifications.

Payment for the weight of material will be determined by deducting from the weight of material delivered to the work, the weight of water in the material at the time of delivery to the job, as determined by Test Method California No. 226, in excess of one percentage (1%) point more than the optimum moisture content as determined by ASTM D1557. Payment for the weight of water deducted as provided herein shall not be made.

Existing aggregate base shall not be re-used in the new project improvements unless specifically approved by the Engineer in writing. The Contractor shall be responsible for all materials testing required to verify that the existing aggregate base is suitable for reuse where proposed. As a part of the Contractor's bid he shall not assume that there is an existing AB layer under the existing pavement, or that this AB layer can be re-used in the project, or that the Contractor can receive money from recycling or selling the existing AB. Any assumptions made by the Contractor are at his own risk and no additional compensation will be provided therefor.

Aggregate base used for items other than the structural street and paving sections shown on the plans shall not be charged as part of the contract line item "Class 2 AB". Aggregate base used for trench and structure backfill in trenches or excavations, temporary traffic lanes, over excavation, or for any use other than the specified street structural section must be considered part of the contract line item related to that work and, unless written authorization is obtained from the Engineer, may not be charged to the line item "Class 2 AB".

SECTION 27 BITUMINOUS SEALS

27-1 General

Bituminous Seals shall be as specified in Section 37, "Bituminous Seals," of the State Standard Specifications.

27-2 Payment

Bituminous Seals will be paid for by the ton in accordance with Caltrans Section 37 or by the square yard as shown on the bid item schedule. If seals are being paid for by the square yard, the deductions listed in Caltrans Section 37 will still apply. The contract price paid for the Bituminous Seals shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in noticing the public, clearing the roadways, cleaning the roadway, preparing the roadway, traffic control, spreading, placing, and curing, striping and pavement marking replacement, and pavement marker replacement complete in place as shown on the Plans and as specified in the Specifications, and as directed by the Engineer.

SECTION 28 HOT MIX ASPHALT

28-1 General

Hot Mix Asphalt shall comply with this Section 28 "Hot Mix Asphalt," and the State Standard Specification Section 39 "Hot Mix Asphalt." Where requirements and provisions are shown in both this Section 28 "Hot Mix Asphalt" and Section 39 "Hot Mix Asphalt" of the State Standard Specifications, the requirements and provisions of this Section 28 shall take precedence and govern over the State Standard Specifications.

28-1.1 Summary

Section 28-1 includes general specifications for producing and placing hot mix asphalt (HMA) by mixing aggregate and asphalt binder at a mixing plant and spreading and compacting the HMA mixture. All HMA shall be Type B and shall conform to the provisions in Section 39 of the State Standard Specifications, these Specifications, and the Contract Specifications.

In the City of Visalia all HMA shall be Type "B" asphalt concrete with 3/4" aggregate gradation and PG 64-10 liquid asphalt binder where the total HMA pavement thickness is equal to or greater than 2" in depth unless approved otherwise by the Engineer with the following exceptions:

A. For City of Visalia Trail projects all HMA shall be Type "B" asphalt concrete with 1/2" aggregate gradation and PG 64-10 liquid asphalt binder.

B. Where not otherwise specified Type "B" asphalt concrete with 1/2" gradation and PG 64-10 liquid asphalt binder shall only be used where noted on the Plans, Standard Drawings, these Specifications, the Contract Specifications or where specifically approved by the Engineer in writing.

C. Where a total HMA pavement thickness of less than 2" is specified on the plans, see the Plans and Contract Specifications for the type of HMA that shall be used.

28-1.2 Definitions

coarse aggregate: Aggregate retained on a no. 4 sieve.

fine aggregate: Aggregate passing the no. 4 sieve.

supplemental fine aggregate: Aggregate passing the no. 30 sieve, including hydrated lime, portland cement, and fines from dust collectors.

28-2 Materials

28-2.1 Geosynthetic Pavement Interlayer

Geosynthetic pavement interlayer must comply with the specifications for pavement fabric, paving mat, paving grid, paving geocomposite grid, or geocomposite strip membrane of the State Standard Specifications.

28-2.2 Tack Coat

Tack coat must comply with the specifications for asphaltic emulsion or asphalts of the State Standard Specifications and shall be as specified in Section 28-6.3.

Notify the Engineer if you dilute asphaltic emulsion with water. The weight ratio of added water to asphaltic emulsion must not exceed 1 to 1.

Measure added water either by weight or volume in compliance with section 9-1.02 of the State Standard Specifications or you may use water meters from the California Water Service Co. If you measure water by volume, apply a conversion factor to determine the correct weight.

With each dilution, submit:

A. Weight ratio of water to bituminous material in the original asphaltic emulsion
B. Weight of asphaltic emulsion before diluting
C. Weight of added water
D. Final dilution weight ratio of water to asphaltic emulsion

28-2.3 Asphalt Binder

Asphalt binder in HMA shall be performance graded PG 64-10 and shall comply with the State Standard Specifications for asphalts.

Asphalt binder for geosynthetic pavement interlayer must comply with the State Standard Specifications for asphalts.

28-2.4 Aggregate

Aggregate must be clean and free from deleterious substances.

The specified aggregate gradation may be determined before the addition of asphalt binder or from hot mix asphalt samples delivered to the site as directed by the Engineer and includes supplemental fine aggregate. The City tests for aggregate grading under ASTM C136 & C117 or California Test 202, modified by California Test 105 if there is a difference in specific gravity of 0.2 or more between the coarse and fine parts of different aggregate blends. The City tests for aggregate gradation of extracted samples using ASTM D5444 or equivalent method.

Choose sieve size TV within each TV limit presented in the aggregate gradation tables.

The proposed aggregate gradation must be within the TV limits for the specified sieve sizes shown in the following tables:

Aggregate Gradation
(Percentage Passing)
HMA Type B

3/4-inch HMA Type B

Sieve sizes	TV limits	Allowable tolerance
1"	100	--
3/4"	95–100	TV ± 4
1/2"	85–95	TV ± 5
3/8”	65-80	TV ± 6
No. 4	45–55	TV ± 7
No. 8	32–40	TV ± 5
No. 30	12–21	TV ± 4
No. 200	2.0–7.0	TV ± 2

The 3/4-inch HMA Type B gradation limits have been modified from the 2010 State Standard Specifications to fit the specific requirements of the City of Visalia.

1/2-inch HMA Type B

Sieve sizes	TV limits	Allowable tolerance
3/4"	100	—
1/2"	95–99	TV ± 6
3/8"	75–95	TV ± 6
No. 4	55–66	TV ± 7
No. 8	38–49	TV ± 5
No. 30	15–27	TV ± 4
No. 200	2.0–8.0	TV ± 2

Before the addition of asphalt binder and lime treatment, aggregate must have the values for the quality characteristics shown in the following table:

Aggregate Quality

Quality characteristic	Test method	HMA type			
		A	B	RHMA-G	OGFC
Percent of crushed particles	California				
Coarse aggregate (% min.)	Test 205				
One fractured face		90	25	--	90
Two fractured faces		75	--	90	75
Fine aggregate (% min)					
(Passing no. 4 sieve and retained on no. 8 sieve.)					
One fractured face		70	20	70	90
Los Angeles Rattler (% max.)	California				
Loss at 100 rev.	Test 211	12	--	12	12
Loss at 500 rev.		45	50	40	40
Sand equivalent (min.) [a]	California Test 217	47	42	47	--
Fine aggregate angularity (% min.) [b]	California Test 234	45	45	45	--
Flat and elongated particles (% max. by weight @ 5:1)	California Test 235	10	10	10	10

[a] Reported value must be the average of 3 tests from a single sample.
[b] The Engineer waives this specification if HMA contains less than 10 percent of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

28-2.5 Reclaimed Asphalt Pavement

HMA may be produced using Reclaimed Asphalt Pavement (RAP) in accordance with Section 39-1.02F of the State Standard Specifications. Section 39-1.02F has been copied below for reference. All RAP must meet the requirements of the State Standard Specifications.

You may produce HMA Type A or B, using RAP. HMA produced using RAP must comply with the specifications for HMA, except aggregate quality specifications do not apply to RAP. You may substitute RAP aggregate for a part of the virgin aggregate in HMA in a quantity not exceeding 15.0 percent of the aggregate blend. Do not use RAP in OGFC and RHMA-G.

Assign the substitution rate of RAP aggregate for virgin aggregate with the JMF submittal. The JMF must include the percent of RAP used. If you change your assigned RAP aggregate substitution rate by more than 5 percent (within the 15.0 percent limit), submit a new JMF.

Process RAP from asphalt concrete. You may process and stockpile RAP during the entire project. Prevent material contamination and segregation. Store RAP in stockpiles on smooth surfaces free of debris and organic material. Processed RAP stockpiles must be only homogeneous RAP.

28-3 Hot Mix Asphalt Design Requirements

HMA mix shall be designed in accordance with Section 39-1.03 of the State Standard Specifications. The Engineer will not be performing testing verification as described in Section 39-1.03E or 39-1.03F of the State Standard Specifications.

The Contractor shall provide the City with HMA mix test results and design mix for approval from the HMA supplier prior to construction. The HMA mix design provided by the supplier must be dated within one-year of the date submitted. A Certificate of Compliance from the Batch Plant is required. The Contractor shall be responsible for providing the City with Certificates of Compliance and any other submittal/information/testing the City feels is necessary to verify that the HMA complies with the Contract Specifications.

28-4 Contractor Quality Control & City Quality Assurance

28-4.1 Contractor Quality Control

The Contractor shall be solely responsible for establishing, maintaining, and changing a quality control system to ensure materials and work comply with the Specifications, Plans, and Contract Documents.

It shall be the responsibility of the Contractor to set up a pre-paving conference with the Inspector and Engineer at a mutually agreed time and place prior to paving activities to discuss methods of performing the production of the paving work.

28-4.2 City Quality Assurance

The City of Visalia will be performing quality assurance testing of the HMA throughout the duration of the construction project for City Public Projects. Acceptance of the material placed will be based on the results of the quality assurance testing performed. Any testing required in addition to the original tests due to the failure of the materials to meet Contract Specifications shall be paid for by the Contractor.

For Non-Public projects, the Contractor shall be responsible for all costs involved with providing samples, material testing, and compaction testing, as required for acceptance by the City Inspector and Engineer. The Contractor shall be responsible for providing all test results to the City for acceptance of the materials placed.

The asphalt content of the HMA mixture will be determined by extraction tests in conformance with the requirements of ASTM D2172, ASTM D6307 or Caltrans Test Method 382. The asphalt binder content percentage bitumen ratio (pounds of asphalt per 100 pounds of dry aggregate including supplemental fine aggregate if used) shall not vary by more than 0.40% of asphalt above or below the amount designated by the approved HMA mix submittals. Compliance with this requirement will be determined by testing samples taken from the mat behind the paver before initial or breakdown compaction of the mat. If the Contractor requests, and if the City authorizes, samples may be taken from the plant, truck, windrow, or paver hopper.

Average in-place density will be determined by nuclear gage in conformance with California Test 375, ASTM D2950, or equivalent method approved by the Engineer. Percent of theoretical maximum density shall be determined by laboratory specimens tested in accordance with California Test 309. The HMA will be tested at intervals as required by the City of Visalia. HMA shall be compacted to a percentage of maximum theoretical density of 91% to 97% when compared to laboratory specimens tested in accordance with California Test 309.

For percent of maximum theoretical density, the Engineer determines a deduction for each test result outside the specifications using the reduced payment factors shown in the following table:

Reduced Payment Factors for Percent of Maximum Theoretical Density

HMA Type A and B and RHMA-G percent of maximum theoretical density	Reduced payment factor	HMA Type A and B and RHMA-G percent of maximum theoretical density	Reduced payment factor
91.0	0.0000	97.0	0.0000
90.9	0.0125	97.1	0.0125
90.8	0.0250	97.2	0.0250
90.7	0.0375	97.3	0.0375
90.6	0.0500	97.4	0.0500
90.5	0.0625	97.5	0.0625
90.4	0.0750	97.6	0.0750
90.3	0.0875	97.7	0.0875
90.2	0.1000	97.8	0.1000
90.1	0.1125	97.9	0.1125
90.0	0.1250	98.0	0.1250
		98.1	0.1375
		98.2	0.1500
		98.3	0.1625
		98.4	0.1750
		98.5	0.1875
		98.6	0.2000
		98.7	0.2125
		98.8	0.2250
		98.9	0.2375
		99.0	0.2500
< 90.0	Remove and replace	> 99.0	Remove and replace

Any HMA that has a percent of maximum theoretical density of less than 90.0% or greater than 99.0% shall be removed and replaced by the Contractor at no cost to the City.

If HMA materials do not meet the requirements of the specifications as determined by quality assurance testing, the Engineer shall have the option to order the Contractor to remove and replace the HMA, as directed by the Engineer, with acceptable materials or reduce the payment for the HMA. Any removals and replacements required shall be paid for by the Contractor.

28-4.3 Dispute Resolution

If any disputes arise concerning HMA density or quality of materials, the disputes shall be resolved by taking density cores and testing briquettes in accordance with State Standard Specification Sections 39-1.04F through 39-1.04G. One density core shall represent up to 250 tons of HMA. The Contractor shall be responsible for providing all materials, equipment, and labor for performing the cores and for repairing all cored locations to the satisfaction of the Engineer. The Contractor will also be responsible for providing all traffic control necessary to perform coring and repairs. The cores shall be taken in the presence of the Inspector and shall be given directly to the testing laboratory. All costs will be paid for by the Contractor at no additional cost to the City.

28-5 Production

Production HMA shall comply with the requirements of Section 39-1.08, "Production" of the State Standard Specifications.

28-6 Subgrade, Tack Coat, and Geosynthetic Pavement Layer

28-6.1 General

Prepare subgrade or apply tack coat to surfaces receiving HMA. If specified, place geosynthetic pavement interlayer over a coat of asphalt binder.

28-6.2 Subgrade

Subgrade and base to receive HMA must comply with the compaction and elevation tolerance specifications in the sections for the material involved. Subgrade and base must be free of loose and extraneous material. If HMA is paved on existing base or pavement, remove loose paving particles, dirt, and other extraneous material by any means including flushing and sweeping. HMA shall not be placed on wet or saturated subgrade or base materials.

28-6.3 Tack Coat

A tack coat of grade SS-1h emulsified asphalt at an approximate rate of 0.05 to 0.10 gallon per square yard (0.23 to 0.45 liter per square meter) shall be uniformly applied upon the existing pavement, any paving course, if the surface is such that a satisfactory bond cannot be obtained between it and a succeeding course, all vertical surfaces, gutters, cold paving joints, manholes and the like, shall be painted immediately before the adjoining HMA is placed.

The surface shall be free of water, foreign material, or dust, when the tack coat is applied. To minimize public inconvenience, no greater area shall be treated in any one day than is planned to be covered by HMA during the same day. Close areas receiving tack coat to traffic. Do not track tack coat onto pavement surfaces beyond the job site.

Unless otherwise specified in the Specifications, SS-1h emulsified asphalt shall be applied at the temperatures of 75 degrees F to 130 degrees F. The SS-1h can be cut back with water at the approximate rate of 50 percent.

Full compensation for tack coat material and application shall be considered as included in the contract unit price paid per ton for hot mix asphalt, and no additional compensation will be allowed, therefore. If no hot mix asphalt bid item is included, the cost will be considered included in the various bid items to which the work is associated with; no additional compensation will be allowed therefor.

28-6.4 Geosynthetic Pavement Interlayer

Geosynthetic pavement interlayer will only be used where shown on the Plans or specified in the Contract Specifications. Place geosynthetic pavement interlayer under the manufacturer's instruction.

Before placing the geosynthetic pavement interlayer and asphalt binder:

A. Repair cracks 1/4 inch and wider, spalls, and holes in the pavement. These repairs are not change order work.

B. Clean the pavement of loose and extraneous material.

Immediately before placing the interlayer, apply 0.25 ± 0.03 gal of asphalt binder per square yard of interlayer or until the fabric is saturated. Apply asphalt binder the width of the geosynthetic pavement interlayer plus 3 inches on each side. At interlayer overlaps, apply asphalt binder on the lower interlayer the same overlap distance as the upper interlayer.

Asphalt binder must be from 285 to 350 degrees F and below the minimum melting point of the geosynthetic pavement interlayer when applied.

Align and place the interlayer with no folds that result in a triple thickness, except that triple thickness layers less than 1 inch in width may remain if less than 1/2 inch in height. Folds that result in a triple layer greater than a 1 inch width must be slit and overlapped in a double thickness at least 2 inches in width.

The minimum HMA thickness over the interlayer must be 0.12 foot thick, including conform tapers. Do not place the interlayer on a wet or frozen surface.

Overlap the interlayer borders from 2 to 4 inches. In the direction of paving, overlap the following roll with the preceding roll at any break.

You may use rolling equipment to correct distortions or wrinkles in the interlayer.

If asphalt binder tracked onto the interlayer or brought to the surface by construction equipment causes interlayer displacement, cover it with a small quantity of HMA.

Before placing HMA on the interlayer, do not expose the interlayer to:

A. Traffic, except for crossings under traffic control, and only after you place a small HMA quantity

B. Sharp turns from construction equipment

C. Damaging elements

Pave HMA on the interlayer during the same work shift.

28-7 Spreading and Compacting Equipment

28-7.1 General

HMA shall be spread with an asphalt paver and shall be compacted by any means to obtain the specified density and surface finish to the lines, grades and cross section shown on the plans.

Paving equipment for spreading must be:

A. Self-propelled

B. Mechanical

C. Equipped with a screed or strike-off assembly that can distribute HMA the full width of a traffic lane

D. Equipped with a full-width compacting device

E. Equipped with automatic screed controls and sensing devices that control the thickness, longitudinal grade, and transverse screed slope

Install and maintain grade and slope references. The screed must produce a uniform HMA surface texture without tearing, shoving, or gouging. The paver must not leave marks such as ridges and indentations, unless you can eliminate them by rolling.

Rollers must be equipped with a system that prevents HMA from sticking to the wheels. You may use a parting agent that does not damage the HMA or impede the bonding of layers.

At locations where the HMA is to be placed over areas inaccessible to an asphalt paver, the HMA shall be spread by any means that will obtain the specified results and shall be compacted to the specified density and to the required lines, grades and cross sections.

28-8 Transporting, Spreading, and Compacting

28-8.1 General

Do not pave HMA on wet or a frozen surface surfaces.

You may deposit HMA in a windrow and load it in the paver if:

A. Paver is equipped with a hopper that automatically feeds the screed

B. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material

C. Activities for deposit, pickup, loading, and paving are continuous

D. HMA temperature in the windrow does not fall below 260 degrees F

In areas less than 5 feet wide and outside the traveled way, including shoulders, you may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

A. Segregation
B. Coarse or fine aggregate pockets
C. Hardened lumps
D. Checking

Longitudinal joints in the top layer must match specified lane edges. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the specified lane edges. You may request other longitudinal joint placement patterns.

Until the adjoining through lane's top layer has been paved, do not pave the top layer of:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets

If the number of lanes changes, pave each through lane's top layer before paving a tapering lane's top layer. Simultaneous to paving a through lane's top layer, you may pave an adjoining area's top layer, including shoulders. Do not operate spreading equipment on any area's top layer until completing final compaction.

If leveling with HMA is specified, fill and level irregularities and ruts with HMA before spreading HMA over the base, existing surfaces, or bridge decks. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

If placing HMA against the edge of existing pavement, sawcut or grind the pavement straight and vertical along the joint and remove extraneous material.

Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving. Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder
2. Below 140 degrees F for HMA with modified binder

If a vibratory roller is used as a finish roller, turn the vibrator off.

Do not allow traffic on new HMA pavement until its surface temperature is below 160 degrees F.

If you request and if authorized, you may cool HMA Type B with water when rolling activities are complete. Apply water under Section 17.

If any deficiencies or irregularities occur within the HMA it shall be removed and replaced at the Contractor’s expense as directed by the Engineer.

28-8.2 Spreading HMA

In addition to the general requirements of these Specifications, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices. When placing HMA to lines and grades established by the Engineer, the automatic controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed and maintained by the Contractor.

HMA shall be spread and compacted in layers according to the following table. All thicknesses shown in the table are compacted thicknesses. The top layer shall not exceed the dimensions listed in the following table. All lower layers shall not exceed 0.25 - foot in compacted thickness. The minimum thickness for each compacted layer shall be 2 inches. These requirements may be modified where specifically approved by the Engineer in writing.

Total Thickness Shown on Plans	No. of Layers	Top Layer Thickness		Next Lower Layer Thickness		All Other Lower Layers Thickness	
		Min.	Max.	Min.	Max.	Min.	Max.
3 or Less	One	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
3-1/2	One*	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
4 through 5	2	2	2-1/2	2	3	- - - -	- - - -
5-1/2 or more	**	2	3	2	3	2	3

* It shall be the Contractor's responsibility to use the appropriate equipment and procedures to meet compaction requirements.

** At least 2 layers if total thickness is 5-1/2 inches. At least 3 layers if total thickness is more than 6 inches and less than 11 inches. At least 4 layers if total thickness is 11 inches or more.

When placing the initial mat of HMA on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device. The end of the screed farthest from centerline shall be controlled by a sensor activated by a similar ski device. When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within a 0.01 - foot tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same manner as when placing the initial mat.

Should the methods and equipment furnished by the Contractor fail to produce a layer of HMA conforming to the Section 28-9 "Smoothness" requirements, the paving operations shall be discontinued and the Contractor shall modify his equipment or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during any day's work, the Contractor may use manual control of the spreading equipment for the remainder of that day, however, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the requirements in this section before starting another day's work.

When multiple layers of HMA are required by the Engineer or these Specifications the Contractor shall offset seams of adjacent layers of HMA by twelve inches (12") minimum. The Contractor shall make every effort to lay HMA so that seams on the travel course shall match proposed lane lines as noted on the project striping plans.

28-8.3 Temperatures

HMA shall not be placed when the atmospheric temperature is below 50 degrees F or during unsuitable weather. All HMA paving shall be applied to dry ground.

At the time of delivery to the site of the work, the temperature of mixture shall not be lower than 260 degrees F or higher than 320 degrees F, the lower limit to be approached in warm weather and the higher in cold weather. The temperature of the asphalt at the time it is spread shall be within the above mentioned limits, materials that do not meet these temperature requirements will be rejected, and removed and disposed of at the Contractors expense and no compensation will be allowed for the material.

No layer shall be placed over a layer until the temperature at the surface, of the existing layer, is not more than 160 degrees F.

28-8.4 Compacting

Compacting equipment shall conform to all the general requirements of this Section. HMA shall be thoroughly compacted by rolling. Each roller shall have a separate operator. Rollers must be self-propelled and reversible. It shall be the Contractor's responsibility to determine the type of equipment, number of rollers, number of roller passes, and all other general process means and methods to produce a final HMA section that meets all of the requirements of this Section 28.

Self-propelled compacting rollers shall meet the following criteria:

A. Each roller manufactured after 1998 shall have a Manufacturer's identification plate that is readily accessible and readable with the following information:

   1. Name of Manufacturer.
   2. Model Number.
   3. Static pounds per lineal inch (PLI) (newton per millimeter (N/mm)) of each drum.
   4. Static PLI (N/mm) of ballasted drum
   5. PLI (N/mm) of each drum in vibratory mode.

   Contractors using rollers manufactured prior to 1999 shall have the manufacturer's specifications, providing the information requested above, available to the Engineer upon request. Any roller not having this information shall not be used and shall be removed from the jobsite.

B. Tandem rollers in the static mode used for breakdown or intermediate rolling shall be such that the ballasted or unballasted weight on at least one drum is a minimum of 250 PLI (44 N/mm).

C. Vibratory rollers used for breakdown or intermediate rolling shall have a compactive effort of not less than 250 PLI (44N/mm) of centrifugal force at the setting indicated by the manufacturer's ID plate.

D. Finish rolling shall be performed by static or vibratory steel rollers in static mode

E. Pneumatic-tired rollers used for intermediate rolling shall be the oscillating type having a width of not less than 4 feet and equipped with pneumatic-tires of equal size and diameter, having treads satisfactory to the Engineer. Wobble-wheel rollers will not be permitted. The tires shall be

so spaced that the gap between adjacent tires will be covered by the tread of the following tire. The tires shall be inflated to 90 psi or such lower pressure as designated by the Engineer, and maintained so that the air pressure will vary not more than 5 psi from the designated pressure. Pneumatic-tired rollers shall be so constructed that the total mass of the roller can be varied to produce an operating mass per tire of not less than 2,000 pounds. The total operating mass of the roller shall be varied as directed by the Engineer.

Other rollers may be used subject to approval of the Engineer. All rollers must be maintained in good mechanical condition. Those that cannot be driven along a straight path, operated without jerking, or the amplitude or frequency cannot be adjusted shall not be used and shall be removed from the Work site. No leakage of petroleum products from any roller shall be allowed to come in contact with pavement being constructed, nor shall any roller be permitted to stand motionless on any portion of the work. The surfaces of all roller wheels shall be treated with sufficient water to prevent the pickup of bituminous materials, but under no circumstances shall the quantity of water used be detrimental to the surface of pavement being rolled.

As soon as the layer of HMA has been placed the breakdown rolling shall commence. If the asphalt binder for HMA Type B is unmodified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 250 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 200 degrees F
3. Finish compaction before the surface temperature drops below 150 degrees F

If the asphalt binder for HMA Type B is modified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 240 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 180 degrees F
3. Finish compaction before the surface temperature drops below 140 degrees F

Rolling shall be commenced along the lower edge of the area to be rolled and continued until the edge is thoroughly compacted, after which the roller shall progress toward the highest portion, unless directed otherwise by the Engineer or Inspector. All areas shall be rolled in a like manner.

Rolling shall be performed so that cracking, shoving or displacement will be avoided.

Upon completion of rolling operations, if ordered by the Engineer, the HMA or HMA base may be cooled by applying water.

The completed surfacing shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the HMA by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations, or other objectionable marks in the HMA shall be discontinued, and acceptable equipment shall be furnished by the contractor.

Average in-place density will be determined by nuclear gage in conformance with California Test 375, ASTM D2950, or equivalent method approved by the Engineer. Percent of theoretical maximum density shall be determined by laboratory specimens tested in accordance with California Test 309. The HMA will be tested at intervals as required by the City of Visalia. HMA shall be compacted to percentage of maximum theoretical density of 91% to 97% when compared to laboratory specimens tested in accordance with California Test 309.

28-8.5 Headers

2" x 6" redwood headers or any specie pressure treated wood shall be installed along the unrestrained/free edges of all hot mix asphalt pavement sections. The headers shall have a firm bearing on the header subgrade and the top edges shall be set to conform to the grade of the proposed street grade. Side stakes 2 inches by 3 inches, 18 inches long, or longer, and spaced not over 4 feet apart, shall be driven on the outside of the headers to a depth of 1 inch below the top edge and then nailed to the header with galvanized nails. The joints between the individual boards being used as headers shall be spliced with a 1-inch by 6 inches, 24 inches long board, of the same type as the headers. Payment for furnishing all labor, equipment, tools, and materials to install headers complete in place shall be considered included in the various bid items to which this work is associated with; no additional compensation will be provided therefor.

28-8.6 Joints

Joints between successive runs shall be vertical and at right angles to the line of the improvement. Care shall be exercised in connection with the construction of all joints to ensure that the surface of the pavement is true to grade and cross section. Lapped joints will not be permitted.

When terminating paving operations for the day, the Contractor shall construct temporary hot-mix ramps at all vertical joints which are greater than 1-1/2 inches in height and transverse to through traffic. Temporary hot-mix ramp dimensions and compaction shall be approved by the Engineer. Prior to resuming paving operations, the Contractor shall remove temporary hot-mix ramps to provide for vertical face and a full depth lift joint and apply a tack coat to the faces of the joint.

In locations where new HMA paving abuts existing asphalt concrete that is less than eight years old, or as directed by the City Engineer, all joints shall be required to be finished using an approved heater-remix process to provide a seamless joint with the existing pavement.

28-9 Smoothness

28-9.1 Straightedge

The top layer of HMA pavement must not vary from the lower edge of a 10-foot straightedge:

A. More than 0.01 foot when the straightedge is laid parallel with the centerline

B. More than 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane

C. More than 0.02 foot when the straightedge is laid perpendicular to the centerline and extends edge to edge on any portion of the roadway that is required to have a consistent cross slope

D. More than 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

28-9.2 Smoothness Correction

If the top layer of HMA pavement does not comply with the smoothness specifications, grind and place an overlay of HMA, or remove and replace it. Grind and overlay methods shall only be allowed where specifically approved by the engineer. Do not start corrective work until your choice of methods is authorized by the Engineer.

Corrected HMA pavement areas must be uniform rectangles with edges:

A. Parallel to the nearest HMA pavement edge or lane line

B. Perpendicular to the pavement centerline

Measure the corrected HMA pavement surface with a 10-foot straightedge and correct the pavement to within specified tolerances. All repairs shall be completed to meet the requirements of the Contract Documents at the Contractor's expense and no additional payment will be made therefor.

28-10 Additional Testing and Requirements

When compacted, the new asphalt pavement shall be at the elevations and slopes shown on the plans and shall meet all of the requirements of the Plans, Specifications, and other Contract Documents. Where the new pavement abuts concrete curb and gutter, vee gutter, drive approaches or other concrete improvements used to drain the roadway, the pavement edge shall be one-eighth of one inch (1/8") to three-eights of one inch (3/8") higher than the adjacent concrete improvement, except at the bottom of curb return accessibility ramps or other accessibility ramps where the new pavement edge shall be flush. The surface shall be smooth, without humps or depressions. Deviation from this tolerance shall be cause for rejection of the surfacing. Any areas that are found to be out of compliance with these requirements shall be removed and replaced at the Contractor's expense.

All hot mix asphalt surfaces shall be water tested prior to acceptance. The Contractor shall coordinate with the inspector to schedule the water testing and all testing shall be performed in the presence of the inspector. The entire asphalt surface shall be flooded with water to identify deficient areas. Any areas that are found to be out of compliance with the specification requirements shall be removed and replaced, as approved by the Engineer, at the Contractor's expense.

28-11 Measurement and Payment

Payment for Hot Mix Asphalt used for roadway construction shall be at the contract unit price per ton. The contract price paid for Hot Mix Asphalt shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in sawcutting, grinding, tack coating, hauling, placing, spreading, compacting, finishing, and constructing HMA, complete in place as shown on the plans and as specified in the Specifications, the Contract Documents and as directed by the Engineer. Quantities shall be measured in accordance with the provisions of these Specifications.

Hot Mix Asphalt used for items other than the structural street and paving sections shown on the plans or required by the Contract Documents shall not be charged as part of the contract line item "Hot Mix Asphalt." HMA used for constructing dikes, drive approaches, temporary traffic lanes, trench resurfacing, or for any use other than the specified road structural section must be considered part of the contract line item related to that work and, unless written authorization is obtained from the Engineer, may not be charged to the line item "Hot Mix Asphalt".

Where no bid item for Hot Mix Asphalt is provided, all costs for providing Hot Mix Asphalt shall be included in the various bid items of work to which the work relates; no additional payment will be made therefor.

SECTION 29 STORM DRAINAGE AND SANITARY SEWER FACILITIES

29-1 General

This work shall consist of furnishing all gravity sewer facilities including main pipelines, branch fittings, building or house branches (services), manholes, stub-outs, lampholes, and other sewer facilities and all gravity storm drainage facilities including main pipelines, manholes, laterals, drainage inlets, stub outs, and other storm drainage facilities as shown on the Plans, as specified in the Specifications, and as directed by the Engineer, including testing and internal inspection of all pipes and structures after installation.

QUALITY ASSURANCE: Unless otherwise indicated, all referenced standards shall be the latest edition available at the time of bidding. Any requirements of these Specifications shall in no way invalidate the minimum requirements of the referenced standards.

ASTM C33	Standard Specification for Concrete Aggregates
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM Cl50	Standard Specification for Portland Cement
ASTM C36l	Standard Specification for Reinforced Concrete Low-Head Pressure Pipe
ASTM C443	Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, using rubber gaskets
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM A615	Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
ASTM F679	Standard Specification for polyvinyl chloride (PVC), Large Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM D3034	Standard Specification for Polyvinyl Chloride PVC Pipe & Fittings
ASTM F1336	Standard Specification for Poly(Vinyl Chloride) (PVC) Gasketed Sewer Fittings
ASTM F477	Elastomeric Seals (Rubber Gaskets) for PVC Pipe
ASTM D3212	Standard Specification for joints for drain and sewer plastic pipes using flexible elastomeric seals
ASTM C700	Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM C425	Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings

Manufacturer's Qualifications: Firms regularly engaged in the manufacturing of sanitary sewer and storm drainage system products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years, unless approved otherwise by the Engineer.

Installer's Qualifications: Firm with at least 5 years of successful installation experience on projects with sanitary sewer and storm drainage system work similar to that required for this project, unless approved otherwise by the Engineer.

Inspection and Acceptance of Pipe: Acceptance will be on the basis of design, material tests, and inspection of the complete product. The quality of all materials used in the pipe, the process of manufacture, and the finished pipe shall be subject to inspection by the City. Inspection may be made at the place of manufacture, or on the job site after delivery, or at both places and the pipe shall be subject to rejection at any time on account of failure to meet any of the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture. All pipe which is rejected must be immediately removed from the project site by the Contractor at his own expense.

29-2 Submittals

The Contractor shall obtain from the pipe manufacturer and shall furnish to the Engineer, prior to the use of any materials, a Certificate of Compliance. The certificate shall be signed by the manufacturer of the material or the manufacturer of assembled materials and shall state that the materials involved comply in all respects with the requirements of the Specifications. Other submittal documents may be required on a project by project basis. The Contractor will be responsible for furnishing the Engineer or Inspector with any of the following submittals upon request including, but not limited to the following:

A. Product Data: Submit manufacturer's technical product data and installation instructions for sanitary and storm sewer system materials and products.

B. Maintenance Data: Submit maintenance data and parts lists for sanitary and storm sewer system materials and products. Include this data, product data, shop drawings, and record drawings in a maintenance manual.

C. Shop Drawings; Pipe: Before fabrication, submit for approval drawings showing pipe dimensions, joints, reinforcement and other details.

D. Manufacturer's Certification: Submit design calculations which provide evidence as to the adequacy of the design of pipe proposed for use in the Work. The evidence must be approved in writing by the City before the pipe for the project is manufactured.

E. Mill Certificates; Reinforcing: Submit 2 copies of steel producer's certificates of mill tests for reinforcing steel which indicates that the reinforcing steel meets specified requirements.

F. Mill Certificates; Cement: Submit 2 copies of manufacturer's certification for each shipment of cement used in the manufacturing of pipe indicating that the chemical composition of the cement meets the requirements of ASTM Cl50.

G. Manufacturer's Data; Aggregates: Submit 2 copies of manufacturer's certificates for fine and course aggregates indicating that grading, soundness and abrasion meet the requirements of ASTM C33.

H. Laboratory's Certificate; Pipe: Before delivering pipe to the job site, submit an independent testing laboratory report certifying that the pipe and fittings are in accordance with ASTM

Standards herein referenced. Forward copies of these reports to the City; no pipe will be accepted without these reports.

I. Absorption Test Reports: Submit test reports which demonstrate and certify that the absorption test requirements for pipe to be used on this project are in accordance with ASTM C76.

J. Compression Test Results: Submit test reports which demonstrate and certify that the compression test requirements for pipe to be used on this project are in accordance with ASTM C76.

K. Shop Drawings; Manhole Frames, Grates, and Covers and Manhole Steps: Submit for approval shop drawings for grates, drains, manhole covers, frames and steps.

L. Shop Drawings; Precast Concrete Box and Manhole Sections: Submit for approval shop drawings for each type and size of precast structure. Joints between components and with pipes shall be detailed.

29-3 Materials

Unless otherwise specified in the Contract Specifications or noted on the plans, the Contractor may have the option of using any of the following:

STORM DRAIN (STORM SEWER) PIPE:
Where storm drain (storm sewer) pipe is specified in the approved Plans, the Contractor will be allowed to install Poly Vinyl Chloride Pipe (PVC) or Rubber Gasket Reinforced Concrete Pipe conforming to these Specifications or an approved equal, except where a particular type of pipe is specified in the approved Plans or Contract Specifications. Once pipe laying operations have begun, the Contractor will not be allowed to switch to a type different from that being laid.

SANITARY SEWER PIPE:
Where sanitary sewer pipe is specified in the approved Plans, the Contractor will be allowed to install Poly Vinyl Chloride (PVC) pipe conforming to these Specifications or an approved equal, except where a particular type of pipe is specified in the approved Plans or Contract Specifications. Vitrified Clay pipe will only be allowed as specified in Section 29-3.2. Once pipe laying operations have begun, the Contractor will not be allowed to switch to a type different from that being laid.

29-3.1 PVC Pipe & Fittings

Unless otherwise specified in the Contract Specifications, pipes for sanitary sewer mains, fittings, and building and house branches (services) shall be polyvinyl chloride (PVC), as specified herein.

PVC pipe shall conform to the provisions in the ASTM Standard Specifications tabulated below, for the standard dimension ratio (SDR) or pipe stiffness (PS) designation given, and these specifications.

Pipe Size (Inches)	ASTM	SDR or PS
4-15	D3034	SDR 35
18-30	F679	PS 115

PVC pipe and fittings shall be manufactured of PVC compound containing not more than 10 parts per 100, by weight, of additives and fillers, including but not limited to, stabilizers, antioxidants, lubricants, and colorants.

PVC pipe and fittings for sanitary sewers and sewer services shall be green in color.

Chemical Resistance: PVC pipe shall have the properties in the following table, when tested before and after exposure to certain chemical solutions as specified in the American Public Works Association Standard Specifications for Public Works Construction "Greenbook," Section 207-15.3, as amended.

Property	ASTM Test Method	Allowable Change (After 112-Days Exposure)		
Minimum Yield Strength (psi)	D 638	- 0% (No Reduction)		
Impact Strength (Ft. - lbs/in.) Notch Min.	D 256 Method A (Size ½" x ⅛" x 2½")	- 0% (No Reduction)		
Weight Change % Unconditioned Conditioned	D 543	 ±1.5 max ±1.0 min	 ±1.5 max ±1.0 min	 ±1.5 max ±1.0 min

PVC Pipe shall be clearly marked as follows at intervals of five feet or less:

Manufacturer's name or trademark	Legend "Type PSM SDR-35 PVC Sewer Pipe"
Nominal pipe size	ASTM D3034
PVC cell classification	(12454-B or 12454-C or 13364-B)

PVC pipe fittings shall conform to the provisions in ASTM F1336 and these specifications for gravity sanitary sewer piping. PVC fittings and accessories shall be as manufactured and furnished by the pipe supplier, or approved equal, and have bell and/or spigot configurations identical to that of the pipe. Where shown on the Plans, injection molded PVC wye fittings shall be used for future building or house branch connections at the time of installation of the sanitary sewer main. Where indicated on the Plans or specified in the Contract Specifications, each wye branch for future sewer service connections shall be provided with an end cap or plug approved by the pipe manufacturer for use with its product.

PVC Fittings shall be clearly marked as follows:

Manufacturer's name or trademark	"PSM"
Nominal size	"ASTM D3034"
Material Designation	"PVC"

A. Joints and Gaskets

Joints shall be integral bell and spigot push-on joints conforming to the provisions in ASTM D3212 and these Specifications, with factory installed elastomeric gaskets. Joints shall be configured so as to prevent improper installation of the gasket and ensure that the gasket remains in place during the joining operation. Bell and spigot configurations for fittings and couplings shall be compatible with those used for pipe joints.

Spigots shall have a home mark to indicate proper penetration when the joint is made.

Elastomeric gaskets shall conform to the provisions in ASTM F477 for thermoset elastomeric gaskets, and these specifications. Gaskets shall be factory installed by the pipe manufacturer, and shall be specifically intended for use with the pipe.

Gaskets shall be manufactured from a synthetic elastomer, containing not less than 50% by volume of first-grade synthetic rubber. The remainder of the compound shall consist of pulverized fillers free of rubber substitutes, reclaimed rubber, and deleterious substances.

A gasket shall contain no more than one splice. A splice shall be made by applying a suitable cement to the ends and vulcanizing the splice in a full mold.

B. Test Requirements

During production of the pipe, the pipe manufacturer shall perform the tests specified in ASTM D3034 and F679. A certificate of compliance with specification requirements shall be provided by the manufacturer, for each lot of pipe from which pipe is delivered, and shall be delivered with the pipe. The certificates of compliance shall include the test results. The Contractor shall submit the certificates of compliance to the Engineer prior to commencing excavation for installation of the pipe.

In addition, when so directed by the Engineer, the Contractor shall obtain PVC compound samples and shall provide test specimens in accordance with ASTM D1987. The Contractor shall also provide one test pipe selected at random by the Engineer from each 1200 feet or fraction thereof, or from each pipe lot or fraction thereof. A lot shall be defined as all pipe having identical identification marking. The length of test pipe for each selected pipe shall be a minimum of 8 feet. The Engineer may test the specimens for compliance with specification requirements.

When so directed by the Engineer, the Contractor shall furnish test specimens of gaskets from each batch used in the work.

When the pipe is delivered to the work site, the Engineer may require additional testing to determine conformance with specification requirements for pipe flattening, impact resistance, pipe stiffness, and extrusion quality.

The basis for acceptance will be compliance with specification requirements, as determined by the inspection of pipe, fittings, and couplings, the certificates of compliance, and the results of any tests conducted by the Engineer.

C. Time Limit for Installation

If the Contractor proposes to install any PVC pipe and fittings that are more than 180 days old from the date of manufacture, the Contractor shall retest the materials within 60 days prior to installation, at the Contractor's expense, to demonstrate compliance with specification requirements, unless otherwise directed by the Engineer. The Contractor shall not install any PVC pipe and fittings more than 2 years old from the date of manufacture. PVC pipe that is stored for more than 3 weeks under conditions that may subject the pipe to sunlight or other sources of ultraviolet light shall be covered or otherwise protected from such exposure to prevent pipe material degradation ultraviolet radiation. The foregoing shall also apply to elastomeric gaskets.

29-3.2 Vitrified Clay Pipe

Vitrified clay pipe and fittings shall only be used if required by the Plans or Contract Specifications. In such case, vitrified clay pipe, shall be extra strength, bell and spigot, and shall conform to ASTM Specification Designation C700 with preformed factory fabricated plastisol joints complying with ASTM

Specification Designation C425. Vitrified clay sewer pipe shall also conform to standards of the Clay Products Institute.

29-3.3 Precast Rubber Gasket Reinforced Concrete Pipe

Rubber Gasket Reinforced Concrete Pipe shall be new and comply with ASTM C76, and with the additional requirements specified herein. The cement used in manufacture shall be Type II, as per ASTM C150. Unless otherwise specified in the approved Plans or Contract Specifications, for pipes with inner diameters of 12 inches to 60 inches provide Class III pipe for all pipe buried ten feet (10') or less, Class IV pipe for pipe buried eleven feet to sixteen feet (11'-16'), and Class V pipe for all pipe buried seventeen feet to twenty-seven feet (17'-27'). Pipe class for pipes with inner diameters larger than 60 inches will be determined by the Engineer of Record and will be noted on the Plans or the Contract Specifications. All pipe approved will have an interior surface which is free from roughness, projections, indentations, offsets or irregularities of any kind. Pipe Class could vary depending on native soil type and pipe "D" loads. The Engineer of Record shall be responsible for verifying pipe class for all pipes during the project design stage. If no specific pipe class is called out on the Plans or Contract Specifications the classes above shall be used.

Pipe Lengths: Furnish pipe in standard lengths. Shorter lengths may be used where required by construction details or when approved by the City.

Physical Requirements: Tests shall be performed as described in Section 11, ASTM C76.

Repairs: Pipe may be repaired, if necessary, because of occasional minor imperfections in manufacture or accidental injury during handling and will be acceptable if, in the opinion of the City, the repairs are sound, properly finished and cured, and the repaired pipe conforms to the requirements of ASTM C76. Use mortar for repairs which has a compressive strength of 6,000 psi at the end of 28 days.

Marking: mark all pipe in accordance with ASTM C76; no pipe will be accepted unless these markings appear on all pipe.

Joints: The ends of reinforced concrete pipe sections shall be bell and spigot type and shall be of such design that when properly laid they shall have a smooth and uniform interior surface. Both ends of pipe sections shall be substantially free of cracks and broken edges. Pipe so found to be damaged shall be rejected for use in the work. Each joint shall be sealed to prevent leakage. Sealing of joints shall be accomplished with O-ring rubber gaskets and shall conform to the following specifications:

A. Rubber Gasketed Joints

   Rubber gasketed joints shall conform to the requirements of ASTM C443 and shall be flexible and able to withstand expansion, contraction and settlement.

   The ends of the pipe shall be thoroughly cleaned immediately prior to joining sections of pipe. The two (2) sections joined shall be firmly placed together in such a manner that the tongue or gasket end of the pipe "homes" on the bell end of the pipe. No appreciable gap shall exist at the completed joint, except as permitted by the Engineer at locations where curves in the pipe alignment are specified or required. Excessive gaps in any case shall be cause for rejection of the work, and corrective measures shall be taken when ordered by the Engineer.

B. Construction Joints

   Construction Joints shall only be installed where approved by the Engineer in writing. Whenever two (2) sections of pipe are to be joined where standard joints are not available, such as joining

reinforced concrete pipe to cast-in-place or asbestos cement pipe, a concrete collar shall be constructed around the full periphery of the pipe in accordance with the Standard Drawings. The collar shall be of a minimum thickness equal to that of the concrete pipe, but in no case less than eight inches (8") thick. Rebar may be required depending on the size of pipe being joined, see the Standard Drawings for details. The interior of the joint shall be smoothed with cement mortar and brushed. The area to receive the collar shall be thoroughly cleaned and dampened immediately prior to construction of the collar. Rubber "O" rings shall be installed on each pipe end as shown on the Standard Drawings. After the joint is completed and cured it shall be subjected to exfiltration testing as implemented by the City of Visalia. The cost of constructing concrete collars and testing shall be considered as included in the cost of the items requiring the collar, and no additional payment will be made therefor.

29-3.4 Manhole Materials

Cast-in-Place Concrete:

Concrete for cast-in-place manholes shall be Class 2 concrete conforming to the provisions in Section 50 of these Specifications, unless otherwise shown on the Plans or specified in the Contract Specifications. Portland cement shall be Type II low alkali sulfate resistant conforming to the provisions in ASTM C150. Slump shall not exceed 3 inches. Before using concrete, the Contractor shall submit in writing to the Engineer a copy of all mix designs for acceptance. Cast-in-Place Concrete manholes will only be allowed where approved by the Engineer.

Precast Reinforced Concrete Manhole Sections and Cast-in-Place Manhole Bases

Precast reinforced concrete manhole sections shall conform to the provisions in ASTM C478. Elliptical single line reinforcement is not allowed. The ends of manhole sections shall be in planes at right angles to the longitudinal axis of the section. The ends of manhole sections shall be finished to regular smooth surfaces, and no point on any surface of either the spigot end or bell end shall project beyond, or be more than 1/4 inch short of, the specified plane.

Joints for manhole sections shall be rubber gasket joints of flush bell and spigot design with a contained rubber gasket. Joints and gaskets shall conform to the provisions in ASTM C443 for standard gaskets, except as modified or required otherwise in these Contract Specifications. The gasket shall be confined in a groove or by a shoulder on the spigot end of the manhole section so that neither movement of the section nor hydrostatic pressure can displace the gasket. When the joint is assembled, the gasket shall be compressed to provide a watertight seal.

Rubber gasket joint assemblies shall be formed and accurately manufactured so that installed manhole sections will form a continuous watertight manhole with a smooth and uniform interior surface, and shall provide for slight movements of the sections due to expansion, contraction, settlement, or lateral displacement. The shape and dimensions of the joint shall be such that it shall be self-centering upon closure, and so designed that the gasket will not be required to support the weight of the manhole sections. The rubber gasket shall be the sole element of the joint depended upon to provide water-tightness.

At the Contractor's option Mastic (Kent Seal No. 2) sealants or Ram-Nek flexible sealants conforming to ASTM C990 or equal may be substituted at joints. Mastic shall cover a minimum of 1/2 the compressed surface and shall be installed in accordance with the manufacturer's recommendations. All joints shall be watertight.

Concrete used to construct manhole bases and other facilities shall be Class 2 concrete conforming to the provisions in Section 50 of these Specifications, unless otherwise shown on the Plans or specified in the

Contract Specifications. Portland cement shall be Type II low alkali sulfate resistant conforming to the provisions in ASTM C150. Slump shall not exceed 3 inches. All concrete shall have a 3,000 psi compressive strength at 28 days. Before using concrete, the Contractor shall submit in writing to the Engineer a copy of all mix designs for acceptance. All mix designs shall include break strength data and charts. Concrete manhole bases shall be allowed to cure for a minimum of 24 hours prior to installing manhole barrels. If the Contractor desires to set barrels sooner than 24 hours, the Contractor shall submit an appropriate mix design to the Engineer for approval prior to construction.

Manhole adjustment rings shall be precast concrete manhole adjustment rings conforming to the details shown on the Standard Drawings.

Mortar used in manholes shall be composed of one part, by weight, Portland cement (Type II low alkali conforming to ASTM C150) and 2 parts, by weight, sand. The cement and sand shall be mixed dry and then the water shall be added. All mortar shall be mixed in a proper watertight box, and in no case shall be mixed on the ground. No mortar shall be used that show evidence of having set, and no remixing of mortar or addition of water thereto will be permitted. All manhole joints shall be mortared as shown on the Standard Drawings.

Steel reinforcement bars shall be deformed billet-steel bars of the size called for in the Plans and Specifications, conforming to the provisions in ASTM A615 for Grade 60.

Manhole frames and covers shall be 24" ID Wilkerson and Nutwell or approved equal, and shall be of tough gray iron conforming to the specifications of ASTM A48 for Class No. 30 castings, with the exception that no traverse test will be required. The bearing surfaces of manhole frames and covers shall be machined for bearing and the cover shall seat firmly into the frame without rocking. All castings shall be heavily coated with asphaltum paint with the exception of machined surfaces. All manhole covers shall be marked "City of Visalia" "Storm Drain System" or "Sanitary Sewer System", as shown on the Standard Drawings.

When manholes are constructed in new streets or in areas that require new pavement section installation, they shall be left below grade until the street has been paved in accordance with Section 29-7 "Manhole Construction." After the paving materials have been compacted they will be raised to grade with grade rings. Concrete shall be placed around frame and left two (2) inches below the finished street grade. Type B 1/2 inch aggregate grading hot mix asphalt paving in accordance with the requirements of Section 28 shall be used to fill the final 2" and rolled.

29-4 Trenching and Excavation

Trenching for sanitary sewer and storm drain pipes, laterals, manholes, drain inlets and other facilities shall conform to the requirements of Section 8-15, "Utilities and Non-Street Facilities; Potholing," and Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration."

29-5 Sewer and Storm Drain Pipeline Installation

Construction of sewer or storm drain pipelines connecting to existing sewers or storm drains shall begin at the existing point of connection location and proceed upstream with the spigot end of the pipe in the direction of flow, unless otherwise approved in writing by the Engineer. Existing sewer and storm drain lines shall remain operational at all times, unless approved otherwise in writing by the Engineer. The Contractor shall furnish and install a gasketed stainless steel band-type repair coupling specifically designed for such use and approved by the Engineer where small diameter PVC sewer pipe is to be connected to an existing pipe of similar diameter. A concrete collar shall then be installed around the repair coupling completely encasing the coupling in concrete in accordance with the Standard Plans.

Where larger diameter pipes, concrete pipes or other pipe types are being connected, or pipes of dissimilar materials or diameters are being connected a concrete collar construction joint shall be constructed in accordance with the Standard Plans. All connections from new to existing pipes must be approved by the Engineer in writing prior to construction.

Sewer and Storm Drain pipe and fittings shall be laid to true line and grade, and jointed in compliance with the manufacturer's recommendation and shall be carefully adjusted to grade by scraping away or filling and tamping the trench bottom to eliminate any possible sag or high point in the pipe. Occasional variations as follows will be permitted: above grade, 1/4 inch; below grade, not to exceed 1/2 inch; alignment not to exceed 2 inches if gradual over a distance of 20 feet. Use of blocks to support the pipe is prohibited. Each joint of pipe must be fully pressed into place so that there will be no unevenness or settlement of one length of pipe with the other at the joint.

The Contractor shall furnish and use a laser device for control of alignment and grade of the pipe. When conditions are such that this method is impracticable, such as on short pipe runs, the Contractor shall have an Engineer on the ground to set grade by means of an Engineer's level. The grade line shown on the Plans indicates the flow line or invert of the pipe; all cuts, unless otherwise indicated, refer to this line.

The interior of the pipe shall be kept free from dirt and other foreign material as the laying progresses. Any pipe that shows undue settlement or is damaged shall be taken up and replaced or re-laid at the Contractor's expense. The open ends of all pipes being installed must be covered to keep out animal life, etc., whenever the pipe is left unattended for any length of time, such as overnight. The end of any pipe that does not terminate at a manhole shall be closed at the bell end with a plug manufactured for that purpose.

Pipe exposed to the sun during the summer months must be allowed to cool before connection is made to manholes and other facilities, and prior to backfill.

All pipes shall be handled and joined in accordance with the manufacturer’s recommendations. All pipe joints shall be thoroughly lubricated in accordance with the manufacturer’s recommendations prior to joining.

29-6 Sewer Service Lateral Installation

Sewer service laterals shall be furnished and installed by the Contractor at the locations shown on the Plans, in conformance with the Standard Drawing pertaining thereto, the Contract Specifications, and the directions of the Engineer.

Pipe for sewer service laterals shall conform to the requirements of Section 29-3.1, “PVC Pipe and Fittings,” and shall be installed in accordance with the requirements of Section 29-5, “Sewer and Storm Drain Pipeline Installation.”

House connections, branches and spurs shall be 4 inches in diameter, unless otherwise specified on the plans or in the Specifications. House connections shall be constructed on a straight line and slope of not less than 1/4 inch per foot fall from the point where they join the 1/8 bend at the main sewer to the property line. Maximum grades for house sewers, conditional upon main line depths and necessary depth at curb line, shall be obtained. Wyes may be laid flat where grade is a problem. All house laterals shall have a minimum cover of 5 feet below curb grade at the right-of-way line unless greater depths are shown on the Plans or noted in the Contract Specifications. Where special conditions warrant the Engineer may authorize at a reduced depth. Such approval must be obtained prior to installation.

All trenches under existing curb and gutter or other City structures shall require a slurry cement backfill meeting the requirements of Section 19-3.3C.

Wherever the depth of a side sewer from the invert to the pavement or ground surface is less than 2 feet, cast iron pipe or concrete encasement shall be used.

Sewer service laterals 4 inches or 6 inches in diameter shall be connected to all sewer mains less than 18 inches in diameter at prefabricated wye fittings conforming to Section 29-3.1, "PVC Pipe and Fittings," or shall be connected to similar pipe stub-outs from manholes. Sewer service laterals 4 inches or 6 inches in diameter may be connected directly to existing sewer mains 18 inches in diameter or greater, providing that a machine core is used in connecting to the main sewer. Sewer service laterals 8 inches in diameter or greater connecting to sewer mains shall require the construction of a manhole at the point of connection. All connections shall be of materials and methods as approved by the Engineer. All connections shall be water tight.

Sewer wye fittings, unless otherwise specified or directed, shall be inclined at an angle of not greater than 45° from the horizontal. Service laterals shall extend from the sewer main to the right-of-way line of the street or alley, where the service lateral shall be promptly closed at the bell end with a plug manufactured for that purpose.

The contractor shall cut into top of concrete curb a 3-inch "S" over house branch. In cases where a concrete curb exists, the contractor shall fasten a No. 8 copper wire or a No. 10 galvanized wire to end of lateral. Wire shall be brought up vertically to within four inches of finished grade where it shall be fastened to a metal pin driven into the side of the trench.

Excavations for laying service laterals shall be made in accordance with the Plans, Standard Drawings and Contract Specifications. Where no direction is given, service laterals shall be installed in such a manner that: 1) at no time will an existing street be closed to traffic; 2) Whenever service laterals are to be installed in existing major arterial or collector streets, or in pavement that is in good condition and free of cracking, they shall be installed by boring methods rather than open cut trenches. Laterals crossing over water mains shall comply with Section 29-12 "Alignment Changes."

29-7 Manhole Construction

Manhole structures shall be constructed at the locations shown on the Plans and as specified in the Contract Specifications, and as indicated on the standard drawings pertaining thereto. Construction of Manholes shall comply with Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration," and Section 29-3.5, "Manhole Materials."

Manholes shall be complete structures in place and backfilled including the furnishing and placing of all materials involved. Cast-in-Place Concrete manholes shall consist of a poured-in-place base and riser section, reinforced concrete reducing cone sections. Pre-cast concrete pipe manholes shall consist of a poured in place concrete base section, reinforced concrete pipe riser and reducing cone sections. Both types shall have a cast iron frame and cover and a poured in place concrete collar with paving patch. In Sanitary Sewer manholes invert channels shall be smooth and semicircular in shape conforming to the inside of the adjacent pipe invert, or flow channels may be provided by use of the bottom half of the specified main pipe as shown on the Standard Drawings. The floor and wall of the manhole outside the channels shall be smooth and shall slope toward the channels. Storm Drain manhole bottoms shall be constructed as shown on the Standard Drawings.

The top of the manhole base section shall be keyed to receive the tongue end of the riser section. The key shall be formed in the freshly poured concrete by using a template manufactured to the dimensions of the riser section. If the riser is cast-in-place monolithically with the base section by using a slip form or other means, the key may be omitted between the base and riser. If the base and riser sections are not poured monolithically, but separately, a key shall be provided in the base section. In either case, a key will be required in the top of the riser section to receive the tongue end of the tapered cone. Cast-in-place concrete manhole bases shall be allowed to cure for a minimum of 24 hours prior to installing manhole barrels. If the Contractor desires to set barrels sooner than 24 hours, the Contractor shall submit an appropriate mix design to the Engineer for approval prior to construction.

All joints in the interior and on the exterior of the manhole shall be mortared and troweled smooth as shown on the Standard Drawings. All excess mortar and any other debris shall be removed from the manhole.

In Sanitary Sewer manholes changes in direction of flow shall be made with a smooth curve of as large a radius as the size of the manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly.

Stub-outs shall be installed in manholes at the locations and sizes shown on the Plans. All stub-outs shall be sealed with a plug of a type approved by the manufacturer of the pipe and shall be capable of forming a watertight seal. Seal shall be capable of remaining water tight when subjected to hydrostatic pressure resulting from submerged pipeline situations. For concrete pipes with an inner diameter of 48 inches or less where a pre-manufactured plug is not available the plug may be installed in accordance with the City Pipe End Plug Standard Drawing. End plugs for pipes with an inner diameter larger than 48 inches shall be designed by the Engineer of Record and approved by the City Engineer.

All manholes shall be completed to finish grade with concrete collar and paving patches (where indicated) as shown on the Standard Drawings and as herein specified. In undeveloped areas where no street or alley surfacing is to be done in conjunction with or immediately after utility installation, the manhole cover shall be finished off to a level 1 inch above ground elevation and shall be provided with 12 inches of grade rings. In existing street areas where surfacing exists and no new street re-grading is contemplated in conjunction with or immediately after utility installation, the manhole cover shall be brought to existing street grade and finished off. In areas where street or alley surfacing is to be done in conjunction with or immediately after utility installation, such as new subdivisions, or in existing street/alley areas manholes shall initially terminate with the top of the cone 6 inches below subgrade and shall be brought to street or alley surface with grade adjustment rings and completed after street paving/trench resurfacing is accomplished. Unless specifically otherwise indicated in the Contract Specifications, it will be the responsibility of the Contractor to install the manhole covers to finish grade as specified and as shown on the Plans and Standard Drawings.

The Contractor should be aware that connections to existing sewers will be "wet" and the Contractor shall make whatever arrangements are necessary to complete the manhole connections under the "wet" conditions.

Where necessary, mounds or dikes shall be placed around the perimeter of manhole covers to prevent rainwater or other inflow of water from entering the manholes. No steps shall be installed in manholes unless otherwise noted on the Plans or Specifications.

29-8 Drainage Inlets

29-8.1 General

Drainage inlets shall be cast-in-place concrete as shown on the Plans and Standard Drawings.

29-8.2 Portland Cement Concrete

Portland cement concrete shall conform to the requirements of Section 50 of these Specifications. Portland cement shall be Type II low alkali sulfate resistant conforming to the provisions in ASTM C150. Slump shall not exceed 3 inches. Concrete shall be Class 2 having a minimum 28-day compressive strength of 3000 psi. All concrete shall be ready-mixed and delivered by a supplier acceptable to the City.

29-8.3 Reinforcing Steel

Reinforcing steel, if required, shall conform to ASTM A615, A616, A617, or A706, Grade 40 or Grade 60 and of the applicable size as indicated on the Plans and Standard Drawings.

29-9 Backfill, Compaction, and Surface Restoration

Backfilling, compacting and restoration of surfaces of trenches and excavations for sewer and storm drain facilities shall conform to the requirements of Section 19-3, "Trench and Structure Excavation Backfill, Compaction, and Surface Restoration."

29-10 Existing Utilities

Prior to construction it shall be the responsibility of the Contractor to expose all existing pipelines/utilities or other underground obstructions that have the potential to conflict with gravity pipelines and structures being constructed with the project and verify that there are no grade conflicts or other conflicts. Failure to do so relieves the City from further responsibility of said conflict. Any additional costs incurred as a result of the Contractor's failure to comply with this requirement shall be borne by the Contractor and considered included in the contract unit price.

Utility company service laterals are not shown on project plans. Contractor should allow for gas, water, sewer, telephone, and cable TV services for each lot shown. Utility companies will locate services and Contractor shall protect all services and facilities from injury. In case of damage to existing utilities, they shall be restored by the Contractor or by utility company personnel to the same type and quality of improvement without additional compensation.

Whenever underground conduit is constructed through, under, or across lawns, shrubbery, gardens, or fences, the Contractor shall remove such improvements before excavating, give them proper care and attention, and replace them in their original location upon completion of the backfill.

All curbs, walks, gutters, curb drains and any improvements broken during construction shall be reconstructed by the Contractor, using new material with the same dimensions as the original work, at the Contractor's expense unless otherwise provided in the Specifications. In addition, curb, gutter and walk shall be removed and replaced to a smooth edge or to the next joint or scoring line beyond the actual damaged or broken sections. All work shall be new and shall match as nearly as possible the appearance of the original improvements.

29-11 Pipeline and Structure Acceptance Tests (Sanitary and Storm)

The required acceptance tests are dependent on pipe material type as specified in the following paragraphs. This section describes the acceptance test requirements for mandrel deflection testing, exfiltration testing, low pressure air testing, and video inspection. All tests shall be performed under the supervision of the Inspector or Engineer and utilizing the procedures listed in this section. Test shall not

be made until the section of pipe to be tested, including house branches, have been cleaned, completely backfilled and the trenches compacted as specified in these Specifications. For larger pipes a physical inspection of the pipe may also be made. In such case, the Contractor shall furnish adequate blowers and ventilation equipment to allow passage of personnel through the pipe.

PVC Pipes

PVC pipe shall be subject to mandrel deflection testing, low pressure air testing, and video inspection in accordance with the testing requirements of this section.

Cast in Place and Precast Reinforced Concrete Pipe & Vitrified Clay Pipe

Precast Concrete Pipe, Cast in Place Concrete Pipe and Structures, Storm Drain Manholes and structures, and Vitrified Clay Pipe shall be subject to exfiltration testing and video inspection in accordance with the testing requirements listed in this section. Exfiltration testing is not required for normal City Standard Sewer manholes unless required in the Special Provisions.

29-11.1 Mandrel Deflection Test

Deflection testing shall be provided by the Contractor for all PVC pipe installations. The Contractor shall demonstrate that the maximum pipe deflection does not exceed five percent (5%) of the diameter of the pipe installed by pulling a properly sized solid ball or mandrel or a rigid set of discs, as approved by the Engineer, through the pipe. Where deflection of the pipe exceeds the allowable, the Contractor shall, at his own expense, make suitable repairs to the line before it is offered for retesting and acceptance. All repairs shall be made to the satisfaction of the Engineer.

29-11.2 Exfiltration Test

All precast concrete pipe and manholes and cast-in-place concrete pipe and manholes shall be subject to Exfiltration Acceptance Testing in accordance with ASTM C969, latest edition, as implemented by the City of Visalia Community Development Department. The Contractor may contact the Community Development Department at (559) 713-4414 for further details concerning test procedures and requirements.

29-11.3 Air Test

Air testing shall be provided by the Contractor for all PVC pipe installations without the addition of seals to the pipe interior. The application of mortar, epoxy, caulking compounds, or other material to the pipe will be prohibited unless authorized by the Engineer. Failure to meet the air test will require the Contractor to replace sections as required. Any broken pipe, separation of joints, or any pipe not laid true to line and grade, shall be replaced. All test expenses are to be borne by the Contractor.

Plugs to be used in the test shall be the pneumatic type equipped with pressure gauges for measuring air pressure in the pipe to be tested. The pressure gauges shall be calibrated in one-half of one pound per square inch (½ psi) increments and connected to the plug in such a way that when the plug is placed in the installed line, the gauge can be located outside of the manhole.

All plugs shall be seal tested before being used in the actual test installation. The seal test shall be conducted by placing in both ends of a pipe laying on the ground, the plugs to be tested. The plugs shall then be inflated to twenty-five pounds per square inch gauge (25 psig). The sealed pipe shall then be pressurized to five pounds per square inch gauge (5 psig). The plugs shall not move when subjected to this pressure.

The length of line tested at one time shall be limited to the length between adjacent manholes.

Air test procedure shall be as follows: Pressure the test section to three and one-half pounds per square inch (3½ psi) and hold above three pounds per square inch (3 psi) for not less than five (5) minutes. Add air if necessary to keep pressure above three pounds per square inch (3 psi). At the end of this five (5) minute saturation period, note the pressure (must be 3.0 psi min.) and begin the timed period. If the pressure drops one-half of one pound per square inch (½ psi) in less than the time given in the following table, then the section of pipe shall not have passed the test.

LINE SIZE	MINIMUM TIME (SECONDS)
4"	122
6"	184
8"	245
10"	306
12"	367
15"	460

For larger diameter pipe use the following formula:

Minimum Time (seconds) = 370 multiplied by pipe diameter (feet)

If the test is not passed, the leak shall be found and repaired to the satisfaction of the Engineer and the length of the repaired line retested.

The pressure gauge used shall be supplied by the Contractor, shall have minimum divisions of one tenth of one pound per square inch (0.10 psi) and shall have an accuracy of four hundredths of one pound per square inch (0.04 psi). Accuracy and calibration of the gauge shall be certified by a reliable testing firm at six (6) month intervals or when requested by the Engineer.

A physical inspection of the pipe may also be made. In such case, the Contractor shall furnish adequate blowers and ventilation equipment to allow passage of personnel through the pipe. The Contractor shall promptly repair all defects in workmanship noted in the inspections.

29-11.4 Video Inspection

The contractor shall furnish video inspection of all newly installed storm drain and sanitary sewer mains. The video inspection shall be made after required leakage and deflection tests have been completed and before permanent trench resurfacing. Prior to performance of the camera inspection, the Contractor shall flush the lines with water to provide indication of high or low spots in the flow line grade. The inspection shall be recorded in true color in DVD format. The camera resolution shall be of a quality that will allow pipe joints to be inspected, imperfections in the pipe to be noted and any sag to be detected. The camera equipment shall also provide on screen footage, date, location, and time indication.

A written log shall accompany the recorded inspection. The following information shall be included:

1. Date
2. Tape Number
3. Location and Stationing references from the Plans
4. Pipe Material and Size
5. Name of Equipment Operator
6. Name of Firm Performing the Inspection

7. All deficiencies in the pipe and installation shall be noted and their location referenced to their on-screen footage readout.

The testing company shall provide a map of the tested pipe. Information provided shall clearly correlate between pipeline plans and the recorded video inspection. Lateral lines shall be documented by stationing from centerline of manholes. For Sewer pipes with an inner diameter of 36 inches and larger and for Storm Drain pipes with an inner diameter of 48 inches and larger all pipe joints shall be video recorded in detail to verify that no damage is present, that gaskets are not visibly compressed or jammed in the joint, and that any gaps that exist in the joints meet the pipe manufacturer's requirements.

Within 24 hours of the completion of the video test, **2 hard copies** of the test log and DVD's shall be delivered to the Engineer. The video test and log shall become the property of the City of Visalia.

The City shall be the sole judge as to the acceptability of construction revealed by the video inspection. Any broken, damaged, or deficient pipe, any separation or offset of joints, any pipe exceeding the tolerances for line, grade, or deflection, and any infiltration points shall be replaced or repaired at the Contractor's expense. The repair will then be re-inspected at the Contractor's expense until the repair is satisfactory.

29-12 Alignment Changes (Separation Criteria)

All non-potable water mains, which include sanitary sewers, sewer force mains, recycled water mains, storm drains, and potable water mains must meet the separation standards of the "California Waterworks Standards", contained in Section 64572, Title 22, of the California Administrative Code, or shall be installed in accordance with alternate construction criteria as specified therein. Included by reference is a document titled "Guidance Memo No. 2003-02: Guidance Criteria for the Separation of Water Mains and Non-Potable Pipelines" published by the California Department of Health implementing said Section 64572. This document sets forth minimum spacing requirements between drinking water pipelines and sewer and other non-potable water pipelines, and has been used to set the location of the sewer and storm mains. In the event that field conditions require a change in the planned alignment (horizontal or vertical) of the sanitary sewer or storm sewers, under no circumstances shall a change be made without obtaining the express and written approval of both the City Inspector and the Engineer. Any change so authorized must comply with the Guidance Memo.

29-13 Measurement

Measurement for sanitary sewer and storm drain main installation and service lateral installation shall be by the lineal foot of pipe installed and remaining in place after the project is completed, and shall be the actual horizontal length installed, measured through wye fittings. Wyes will not be measured separately when constructed with a lateral.

Where wyes are to be installed for future lateral connections, measurement for wye fittings shall be per each wye fitting installed.

Measurement for manholes shall be per each manhole installed.

Measurement for drainage inlets shall be per each drain inlet installed.

29-14 Payment

The unit price bid per lineal foot for Sanitary Sewer Mains and Storm Drain Mains shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents,

and as directed by the Engineer. This shall include, but not be limited to, furnishing and installing the pipe, sawcutting, trenching, shoring and bracing (where there is no Worker Protection bid item), backfilling, compacting, plugging and marking, connecting to existing manholes or pipes, and acceptance testing.

The unit price bid per lineal foot for Storm Drain laterals and Sewer Service laterals shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents, and as directed by the Engineer. This shall include, but not be limited to, furnishing and installing the wye fitting, pipe, trenching, sawcutting, shoring and bracing (where there is no Worker Protection bid item), backfilling, compacting, plugging and marking, connecting to existing manholes or pipes, and acceptance testing.

The unit price bid per each for wye fittings, where wye fittings only (no lateral) are to be installed, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents and as directed by the Engineer, in excess of the cost of installing main line pipe. This shall include, but not be limited to, furnishing and installing the wye fitting and plug, trenching, sawcutting, shoring and bracing (where there is no Worker Protection bid item), backfilling, compacting, and acceptance testing.

When the contract does not include a pay item for wye fittings as above specified, and unless otherwise provided in the Contract Specifications, full compensation for wye fittings shown on the plans shall be considered as included in the price bid for the Sanitary Sewer Main item of work and no separate payment will be made therefor.

The unit price bid per each for Sewer Manholes and Storm Drain Manholes shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, and as directed by the Engineer. This shall include, but not be limited to, furnishing and installing the manhole and pipe stub-outs, shoring and bracing (where there is no Worker Protection bid item), excavation, backfill and compaction, sawcutting, returning and adjusting manhole lids and frames to final grade following street or alley construction or reconstruction, temporary and final trench resurfacing, and connections to all pipes, wet or otherwise.

The unit price bid per each for Drainage Inlets shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Specifications, and as directed by the Engineer. This shall include, but not be limited to, furnishing and installing the inlet and pipe stub-outs, shoring and bracing (where there is no Worker Protection bid item), sawcutting, excavation, backfill and compaction, returning, removal and replacement of sidewalks, pavement section, and curb and gutter, and connections to all pipes, wet or otherwise.

SECTION 30 (RESERVED)

SECTION 31 (RESERVED)

SECTION 32 (RESERVED)

SECTION 33 SANITARY SEWER FORCE MAINS (RESERVED)

SECTION 34 BORING AND JACKING PIPE

34-1 General

Description of Work:

This work shall consist of furnishing, boring, and jacking into place at the locations and type of pipe shown on the Plans or specified in the Contract Specifications, and as directed by the Engineer. This section is meant for use with gravity pipelines. See the Plans and Contract Documents for additional requirements related to pressure pipelines.

Reinforced concrete jacking pipe with rubber gasket joints, as a carrier pipe as specified in this Section 34, may be jacked into place directly without a jacked steel casing. All other carrier pipe must be installed within a jacked steel casing.

Job Conditions:

A. Protection of Existing Underground Utilities:

1. The locations of existing utilities are shown in the approved Construction Drawings based upon information and data supplied by the City or by the Owner of the utility. The utilities are shown on the approved Construction Plans for information only and are not guaranteed to be either complete or accurate. It is the Contractor's responsibility to contact all utilities and USA to locate utilities prior to construction. Utilities shall be located by hand digging or potholing prior to construction. Contractor shall be responsible for verifying that no conflicts exist between existing utilities and proposed improvements.

2. Any damaged caused to existing utilities shall be reported to the appropriate utility and repaired in accordance with the utility's standards.

3. The cost to repair/replace damaged utilities shall be borne by the Contractor.

4. If an interruption of utility service results from accidental damage, the Contractor shall take immediate steps as necessary to notify the utility and restore service. Contractor's personnel shall not leave the site until the interruption has been restored.

B. Work Within Railroad or Utility Right-of-Way:

When the Contractor is performing work within the right of way of other jurisdictions such as railroads or utilities, such work shall comply with applicable permits or regulations of such jurisdictions. The Contractor will be responsible for filling casing pipes with sand or a cement-sand slurry as directed by the jurisdiction having authority over the installation.

34-2 Materials

34-2.1 Steel Casing Pipe

Steel casing pipe shall be of the outside diameter (OD) and minimum wall thickness not less than that shown on the Plans and shall be butt welded of sheets conforming to ASTM A36, ASTM A139 Grade B (Tolerance, Yield Strength, and tensile strength with no hydro test), ASTM A53 Grade B, or ASTM A252 Grade 1. The minimum yield strength of all casings shall be thirty-five thousand pounds per square inch (35,000 psi). The Engineer of Record will be responsible for performing design calculations to determine the appropriate yield strength and wall thickness for each situation. All plans shall denote the casing strength and dimensions. The casing diameter shall be sized so that at least 3-inches of clearance is provided between the inside of the casings and outside of the carrier pipes belly, completely around. If the Contractor's operations require a greater wall thickness for successful installation of the steel casing

pipe to line and grade without damage, the Contractor shall provide steel casing pipe of such greater wall thickness at no additional cost to the City.

Steel casing pipe shall be of the size and class (including strength designation) shown on the Plans or specified in the Contract Specifications, except that the class of pipe designated has been determined for vertical loads only. Additional facilities, reinforcement, or strength of pipe required to withstand jacking pressure shall be determined and furnished by the Contractor at his expense.

All field joints also shall be butt welded full circumference or by other means approved by the Engineer. Joints to be field welded shall be shop cut to ensure a true 90° to the longitudinal axis of the pipe. It shall be the Contractor's responsibility to provide joints that are capable of resisting the jacking stresses without failure.

34-2.2 Casing Spacers

Casing spacers are required to be used for all installations. PVC casing spacers shall be attached to the conduits with stainless steel straps to center the pipe in the casing. The spacers shall prevent appreciable movement of the conduit up or down or sideways within the casing. Spacers shall be placed every four feet (4') on center throughout the steel casing.

Redwood Skids may be used instead of PVC spacers. Skids shall be comparable quality and functionality, spaced at four feet (4') on center.

Casing spacer materials shall also conform to the following requirements:

A. Bands shall be 304 stainless steel, 8 inches wide for carrier pipes up to 24 inches in diameter, and 12 inches wide for larger carrier pipes. Bands shall be two segment, 14-gauge bands for carrier pipes less than 42 inches in diameter, and shall be three or more segment, 12-gauge bands for larger carrier pipes. Bands shall be fitted with a flexible PVC liner on the inner surface of the band. The PVC liner shall have a thickness of 0.09 inch, a hardness of 85-90 (ASTM D2240, Durometer "A"), and a dielectric strength of not less than 58,000 volts (ASTM D149).

B. The configuration of the casing spacers shall be as shown on the plan. A maximum of 1-inch gap shall exist between the top of skid and inside of casing.

The casing spacer manufacturer shall have implemented a quality management system, and shall hold a current certificate of registration, issued by a certifying organization acceptable to the Engineer that is applicable to the manufacturing of casing spacers. A copy of the certificate of registration shall be submitted to the Engineer.

34-2.3 Casing End Seals

Each end of the casing shall be plugged with brick and mortar end seals able to withstand backfill pressures during the annular space fill as approved by the Engineer.

34-2.4 Reinforced Concrete Jacking Pipe

Reinforced Concrete Jacking Pipe shall only be used for jacking where shown on the plans or specifically approved by the Engineer. Where reinforced concrete jacking pipe, as a carrier pipe, is specified to be jacked into place directly without a jacked steel casing, said reinforced concrete jacking pipe conforming to ASTM Specification C76, latest revision, shall be furnished. The reinforced concrete jacking pipe shall be constructed such that no bells protrude from the outside periphery of the pipe. Sleeves for joints on reinforced concrete jacking pipe shall be furnished and manufactured of galvanized steel, stainless steel,

or fiberglass, sufficient in strength to withstand all loads, and which will maintain a rubber-gasketed watertight joint.

34-3 Tunnel Safety Orders

Reference is made to the Tunnel Safety Orders of the California Department of Industrial Relations, and to any other applicable safety codes. The tunnel site (jacking location) will be classified as to gas hazard by the California Department of Industrial Relations for casing diameters 30 inches in outside diameter and larger. The classification document issued by the State will be included in the Contract Specifications. The Contractor shall comply with the Tunnel Safety Orders. The Contractor shall contact the California Department of Industrial Relations, Division of Occupational Safety and Health. Reference is made to Section 19-3.2, "Trench and Structure Excavation," of these Specifications for additional safety requirements.

34-4 Excavating Jacking and Receiving Pits

Before starting excavation, the Contractor shall submit drawings or details of jacking pit bracing, casing pipe, jacking equipment, skids or concrete support blocks, bracing to prevent pipe shifting or flotation, and all other equipment or methods to be used.

Excavation for jacking and receiving pits shall conform to the provisions in Section 8-15, Utility and Non-Street Facilities; Potholing," Section 19-3.2, "Trench and Structure Excavation," and to the following provisions.

Jacking and receiving pits shall not extend beyond vertical planes passing through the jacking and receiving pit limits shown on the Plans, and shall be sheathed, shored, sloped or braced in accordance with the Safety Regulations of the State of California, Department of Industrial Relations, Division of Industrial Safety.

The Contractor shall be responsible for furnishing safety fencing and chain link fencing to provide for public safety. Where boring pits are located within existing roadways, the Contractor shall be responsible for providing all traffic barricades and other traffic control devices to safely route traffic around the construction work.

34-5 Boring and Jacking

Unless otherwise specified, the methods and equipment used in jacking operations shall be optional with the Contractor, provided that the proposed method is approved by the Engineer. Such approval, however, shall in no way relieve the Contractor of the responsibility for making a satisfactory installation meeting the criteria set forth on the Plans or specified in the Contract Specifications, or these specifications. Only workers experienced in jacking operations shall be used in performing the work.

Steel casing pipe and carrier pipe shall be installed as shown on the Plans, in conformance with the Contract Specifications, these specifications, and as directed by the Engineer. Steel casing pipe shall be installed such that carrier pipe, when installed to the lines and grades shown on the Plans, will be approximately centered within its casing pipe.

Carrier pipe to be installed within steel casing shall be as indicated on the Plans and specified in the Contract Specifications. Casing spacers shall be installed within 2 feet of each end of the casing pipe, at each side of each carrier pipe joint, and at evenly spaced intermediate locations to provide a maximum distance between casing spacers of 4 feet on center. The carrier pipe shall be supported on skids during the installation of the pipe. The skids shall be installed in such a manner as to relieve the couplings from

all load and bearing. Casing spacers shall be installed in conformance with the manufacturer's recommendations and as specified in these specifications.

Excavation for the casing or concrete pipe not using a casing pipe shall be accomplished by boring. Sluicing or jetting with water will not be permitted. The Contractor may elect to utilize uninterrupted around-the-clock bore and jack operations to prevent "freezing" of the casing or carrier pipe, or to preclude instability at the heading of the bore and jack. The Contractor shall notify the City a minimum of fifteen (15) days prior to performing uninterrupted activities of its intention to do so. All uninterrupted activities must be approved by the Engineer. Full compensation for additional costs incurred as a result of such continuous operations, shall be considered as included in the Contract unit price paid per linear foot for the Steel Casing Pipe or Jacked Reinforced RCP item involved, and no additional compensation will be allowed therefor. In some situations the City may require, such around-the-clock bore and jack operations. The Contractor is directed to the Special Provisions to verify if around-the-clock procedures are required for each project. If the subject is not addressed in the Special Provisions then around-the-clock procedures are not specifically required for the project.

The excavated hole being bored shall not be more than 1 inch in diameter greater than the outside limits of the casing (or reinforced concrete pipe jacked without casing pipe). If the nature of the material is such that caving will likely occur and which may result in a greater space than above specified, a metal shield or jacking head shall be installed which extends a minimum of 18 inches ahead of the jacked casing or pipe. The metal shield shall cover a minimum of the upper 1/2 of the periphery of the jacked casing or pipe. Excavation shall not proceed beyond the shield.

Where ground conditions at the face of the jacking pit are such that sloughing or caving of ground is likely to occur at the face of the excavation upon commencement thereof, the face of the pit shall be made stable so that an excessive void is not carried with the face of the excavation for the length of the casing or pipe. This may be accomplished by solid sheathing at the portal of the jack, or excavating and backfilling the face of the pit with cohesive material.

The Contractor shall diligently monitor soil and groundwater conditions encountered during casing and/or carrier pipe installation, and shall provide any and all necessary groundwater seepage control and dewatering.

Cavities or voids outside the limits specified above, regardless of cause, shall be backfilled with sand, soil, cement, or cement mortar as provided herein or as directed by the Engineer. All casing pipe 30 inches in diameter or larger shall have grout plugs installed suitable for attachment to grout pumping equipment. All reinforced concrete pipe 30 inches in diameter or larger, shall be furnished with preinstalled fittings suitable for attachment to grout pumping equipment. Such grout connections, unless otherwise indicated on the Plans or approved otherwise by the Engineer, shall be placed at 30°, 120°, 240° and 330°, measured clockwise, from vertical around the circumference of the casing or pipe, and at intervals in each row, along the pipe, of not greater than 10 feet. Alternate bottom holes shall be staggered, and alternate top holes shall be staggered, so that one hole will occur at the top every 5 feet and one hole will occur at the bottom every 5 feet.

Immediately after completion of the jacking or boring operation, if in the opinion of the Engineer, excessive voids have been created outside the jacked pipe, lean grout shall be injected through the grout connections in such a manner as to completely fill all voids outside the casing pipe or reinforced concrete pipe resulting from the jacking or boring operation. The lean grout shall consist of one part Portland cement to not more than 4 parts sand by volume, placed at low pressure. Grout pressure is to be controlled so as to avoid deformation of casing pipe and/or avoid movement of the surrounding soil. Sand for grout to be placed outside the casing shall be of such fineness that 100 percent will pass a No. 8

sieve and not less than 35 percent will pass a No. 50 sieve. After completion of grouting, the grout connections shall be closed with cast-iron threaded plugs.

In general, excavated material shall be removed from the casing or reinforced concrete pipe as jacking progresses and no accumulation of excavated material within the casing will be permitted. Should appreciable loss of ground occur in installations where the face of the excavation is accessible, the voids shall be backpacked promptly to the extent practicable with an approved soil cement.

At the successful completion of the installation, casing end seals shall be installed in accordance with Plans and Contract Specifications. Care shall be taken during the placement of these seals that the pipe is not damaged, deflected or displaced.

After the casing and carrier pipe have been installed and inspected for acceptance, dry sand shall then be blown in to fill the annular space between the carrier pipe and casing pipe. All sand must be clean and dry. After the sand has been blown in and inspected the end seals shall be completely sealed.

Special Note: Where boring is located under a waterway including, but not limited to, irrigation ditches, culverts, or creeks the bore shall be completed during a time period when no water is flowing unless approved otherwise by the Engineer. If approved by the Engineer, the Contractor assumes all liability and will be responsible for all damages or costs incurred associated with boring under an active waterway.

34-6 Grade Tolerance

The Contractor's attention is called to the fact that extreme care will be required in placing the casing pipe so as to permit the construction of the carrier pipe to the lines and grades shown on the Plans. It shall be the Contractor's responsibility for selecting a size of casing, at or above the minimum specified, in order that the jacking may be done with a sufficient degree of accuracy to permit installation of the carrier pipe to the grade as shown on the Plans within the tolerances set forth in these Specifications for the particular carrier pipe installed. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne solely by the Contractor. Variations from theoretical alignment and grade of the RCP and steel casing pipe at the time of completion of jacking shall be as follows:

Steel Casing Pipe jacked into place shall not vary from theoretical alignment and grade at the time of completion of jacking by more than 3 inches in 100 feet for storm drain, and 1 inch in 100 feet for sanitary sewer carrier pipe, unless approved otherwise by the Engineer.

Reinforced concrete jacking pipe jacked into place without steel casing shall not vary from theoretical alignment and grade at the time of completion of jacking by more than 3 inches in 100 feet for storm drain, and 1 inch in 100 feet for sanitary sewer carrier pipe, unless approved otherwise by the Engineer.

34-7 Frac-Out Contingency Plan

Unless otherwise specified in the Contract Specifications, a Frac-Out Contingency Plan will be required. Such Plan shall be prepared in accordance with the following provisions and submitted to the Engineer.
For jack-and-bore tunneling activities that use drilling lubricants, the Contractor shall prepare and implement a contingency plan that is intended to minimize the potential for a release of drilling lubricant (frac-out) associated with tunneling activities; provide for the timely detection of frac-outs; and ensure an organized, timely, and "minimum-impact" response in the event of a frac-out and release of drilling lubricant. The contingency plan shall include, at a minimum, the following measures:

A. A full-time monitor shall attend all drilling to look for observable frac-out conditions or lowered pressure readings on drilling equipment.

B. If a frac-out is identified, all work shall stop, including the recycling of drilling lubricant. In the event of a frac-out into water, the pressure of water above the tunnel may keep excess mud from escaping through the fracture. The location and extent of the frac-out shall be determined, and the frac-out shall be monitored for 4 hours to determine whether the drilling lubricant congeals (bentonite will usually harden, effectively sealing the frac-out location).

C. If the drilling lubricant congeals, no other actions shall be taken that would potentially suspend sediments in the water column.

D. Surface releases of bentonite shall be allowed to harden and then shall be removed.

E. The contingency plan shall identify additional measures to be taken to contain or remove the drilling lubricant if it does not congeal.

34-8 Backfill, Compaction, Restoration of Surfaces

Jacking and receiving pits shall be backfilled and compacted, and the surface restored, in accordance with Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration."

34-9 Measurement

Measurement for Steel Casing Pipe jacked into place shall be by the lineal foot of casing pipe jacked into place as shown on the Plans or directed by the Engineer.

Measurement for Reinforced Concrete Jacking Pipe with rubber gasket joints (without steel casing), jacked into place, shall be by the lineal foot of pipe jacked into place as shown on the Plans or directed by the Engineer.

Where carrier pipe is indicated on the Plans to be placed within a jacked casing pipe, carrier pipe will be measured by the lineal foot of pipe installed.

34-10 Payment

The unit price bid per lineal foot for Steel Casing Pipe, jacked into place, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as specified in the Specifications, Contract Documents and as directed by the Engineer. This shall include excavating, backfilling and compacting the jacking and receiving pits, boring and tunneling, furnishing and installing the casing complete with grout fittings, furnishing and installing metal shields, furnishing and installing skids and tie downs, spacers, bands, grouting and backfill of voids, sealing ends of casing, installing blown in sand, temporary and final trench resurfacing, and all other incidental work over and above that associated with the normal work of furnishing and installing the carrier pipe in a trench situation.

The unit price bid per lineal foot for Reinforced Concrete Jacking Pipe with rubber gasket joints, jacked into place, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, and as directed by the Engineer. This shall include, but not be limited to, excavating, backfilling and compacting the jacking and receiving pits, boring and tunneling, furnishing and installing the pipe complete with grout fittings, furnishing and installing metal shields, grouting and backfill of voids, temporary and final trench resurfacing, and all other incidental work over and above that associated with the normal work of furnishing and installing the carrier pipe in a trench situation.

Carrier pipe to be placed in casing pipe as shown on the Plans will be paid for under the unit price bid per lineal foot for Steel Casing Pipe.

SECTION 35 (RESERVED)

SECTION 36 (RESERVED)

SECTION 37 MISCELLANEOUS IMPROVEMENTS

37-1 General

This work shall consist of constructing or reconstruction of miscellaneous street improvements, including relocation of mail boxes, signs, fences or walls, witnessing and resetting survey monuments, lowering and adjusting existing facilities to finish grade, all as shown on the Plans and applicable Standard Drawings, as specified in the Specifications, and as directed by the Engineer.

37-2 Survey Monuments

The Contractor shall comply with the provisions in Section 5-14, "Construction Surveying/Staking." Survey monuments installed to replace existing known monuments to be damaged or destroyed by the work shall be furnished and installed at the locations shown on the Plans and as directed by the Engineer. The survey monument shall be furnished and constructed in conformance with the applicable Standard Drawings. For City Public projects the Contractor shall contact the City Land Surveyor 3 working days prior to disturbing any monuments. The City surveyor will provide the location for the monument to be reset and it shall be the responsibility of the Contractor to furnish all materials and re-build the monument at his own expense. For Non-Public projects constructing improvements in the City right of way, the Contractor shall retain a licensed land surveyor to survey and reset said monument and furnish and install all appurtenances. A record of survey shall be filed with the Tulare County Recorder at the expense of the Contractor.

All known monuments, corners, or other survey markers to be disturbed by the work shall be tied by temporary survey markers in conformance with professional standards prior to beginning construction. Temporary ties and resetting of monuments, corners, or other markers shall be performed by a licensed land surveyor obtained by the Contractor for Non-Public projects prior to beginning construction. Monuments, corners, or other markers shall be re-set to their original precise location and elevation, and marked as required. Known monuments, corners, or survey markers not to be disturbed by the work shall be protected from damage. Any known monuments, corners or markers damaged or destroyed due to the Contractor's failure to protect them shall be replaced in conformance with the applicable Standard Drawing and this Section 37-2 at the Contractor's expense.

37-3 Adjusting Existing Facilities to Finish Grade

Existing facilities shall include manhole frames and covers, valve boxes, pull boxes, vaults, and any other similar existing facilities that must fit or match the final finished surface of the improvement in which they are located. The facilities shall be adjusted to grade within five (5) working days following the completion of the surfacing in which they are located.

Sewer and storm drain manhole frames and covers shall be temporarily lowered below the grading plane and triangulated or monumented to provide quick location throughout the construction process. The manhole frames and covers, and valve boxes and covers shall then be raised to finish grade, concrete collars poured and asphalt-concrete patch placed, in accordance with the Standard Drawings and as directed by the Engineer.

Other existing facilities shall be adjusted to finish grade in accordance with the applicable utility or facility authority involved, and as directed by the Engineer. Where the utility or facility authority involved desires to do the work with their own forces and/or materials, the Contractor shall pay all the costs associated therewith.

37-4 Relocation of Walls, Fences, and Mailboxes

The Contractor shall be responsible for relocating/re-building all walls, fences, and mailboxes disturbed or noted for relocation. All walls, fences, and mailboxes shall be re-built as shown on the Plans and City Standard Drawings.

During construction operations, the mailboxes shall be moved as necessary to clear the way for the Contractor's operations, but at all times mailboxes shall be accessible for rural delivery.

When construction is complete, the mailboxes shall be placed in final position and the pedestals shall be buried the proper depth as directed by the Engineer. Mailboxes shall not extend into the sidewalk area.

37-5 Measurement and Payment

Unless otherwise specified in the Contract Specifications, Miscellaneous Street Improvements shall be measured and paid for on a lump sum basis. Payment shall include full compensation for all labor, equipment and materials required to complete all the work described herein, as shown on the Plans, Standard Drawings, and as specified in the Contract Specifications.

If the Contract does not include a pay item for Miscellaneous Street Improvements, the cost thereof shall be included in the prices bid for the other various items of work and no separate payment will be made therefor.

SECTION 38 CONCRETE CURBS, SIDEWALKS, SURFACE IMPROVEMENTS

38-1 General

This work shall consist of constructing concrete curbs, gutters, curb and gutters, curb depressions, sidewalks, curb (accessibility) ramps, driveway approaches, alley approaches, valley gutters, fence mowstrips and median caps, and other concrete surface improvements of the form and dimensions shown on the Plans or Standard Drawings, as set forth in the Specifications, Contract Documents and as directed by the Engineer. Curb (accessibility) ramps shall also comply with the most current Federal and State Accessibility Standards, whichever is more restrictive.

All concrete improvements as above defined shall be constructed by using fixed forms, except that curbs, curb and gutters, and alley gutters may be constructed by using an extrusion or slip-form machine.

38-2 Portland Cement Concrete

Concrete for curbs, sidewalks, and other surface improvements shall conform to the requirements of Section 50, "Portland Cement Concrete," of these Specifications, and shall be Class 2 or Class 3 as noted on the Plans and Standard Drawings or as specified in these Specifications.

For extruded or slip-formed concrete improvements, the maximum size of aggregate used shall be at the option of the Contractor, but in no case shall the maximum size be larger than 1 inch or smaller than 3/8 inch. For extruded or slip-formed concrete, the cement content shall be as specified for Class 2 concrete.

38-3 Reinforcement

Where the use of steel reinforcement is indicated on the Plans or Standard Drawings, it shall be furnished and installed in accordance with Section 52, "Reinforcement," of the State Standard Specifications, except that Sections 52-1.04, "Payment" of the State Standard Specifications are hereby deleted. All payment for reinforcement complete in place shall be considered included in the price for the various bid items of work to which the work relates; no additional payment will be made therefor.

38-4 Subgrade Preparation

Subgrade Preparation shall conform to the requirements of Section 19-2.7, "Subgrade Preparation, Compaction," and shall be constructed true to grade and cross-section, as shown on the Plans or directed by the Engineer. It shall be thoroughly watered and rolled or hand tamped to obtain a relative compaction of no less than 95 percent under curbs, gutters, curb and gutters, driveway approaches, valley gutters and curb ramps, and a relative compaction of no less than 90 percent under sidewalks, mowstrips and concrete median caps prior to placing the concrete. All soft or spongy material shall be removed to a depth of not less than 18 inches or to stable soil below subgrade elevation for curbs, gutters, curb and gutters, valley gutters, driveways and 6 inches below for caps, mowstrips, sidewalks and curb ramps, and the resulting space filled with earth, sand or gravel of a quality that when moistened and compacted will form a stable foundation.

The subgrade and forms shall be wet immediately in advance of placing concrete.

38-5 Construction

Concrete shall not be placed on frozen or ice-coated ground or subgrade or on ice-coated forms, reinforcing steel, structural steel, conduits, precast members, or construction joints. Under rainy conditions, placing of concrete shall be stopped before the quantity of surface water is sufficient to damage surface mortar or cause a flow or wash of the concrete surface, unless the Contractor provides adequate protection against damage. All concrete that has been frozen, or damaged by other causes, as determined by the Engineer, shall be removed and replaced by the Contractor at the Contractor's expense.

Fixed form construction shall conform to Section 73-1.03C, "Fixed Forms," of the State Standard Specifications, and as set forth in this Section 38-5. Extruded or slip-formed construction shall conform to Section 73-1.03D, "Extruded or Slipform," of the State Standard Specifications, and as set forth in this Section 38-5. The extrusion machine shall go no faster than the curb and/or gutter or alley gutter can be finished using good workmanlike practices.

Construction Joints

Construction joints shall be as shown on the Plans and Standard Drawings, and as specified below for both fixed form and extruded or slip-formed construction, as follows:

A. Where concrete improvements such as curb and gutter, valley gutters, and sidewalk, are to be placed adjacent to existing asphalt pavement, the pavement shall be sawcut and removed 6 inches to 12 inches beyond the inside edge of the formwork. The edge of the existing asphalt pavement shall not be used as formwork.

B. Weakened plane joints shall be placed at 15 foot intervals or as shown on the Plans and Standard Drawings for the item of work to which the work relates, except that for mowstrips they shall be placed at each post location not having an expansion joint. Weakened plane joints shall be placed at 8 foot intervals for median curbs and landscape curbs. Where spacing is specified on the Plans and Standard Drawings that spacing shall govern over these requirements. Tighter joint spacing will be required in areas like curb ramps and drive approaches. Contractor shall verify with inspector prior to construction. Weakened plane joints shall be a minimum of one inch (1") in depth in sidewalks and ramps and shall be finished with a one-fourth of one inch (¼") maximum radius edger. Weakened joints in curbs, gutters and drive approaches shall be a minimum of one and one half inches (1½") in depth and shall be finished with a one-fourth of one inch (¼") maximum radius edger.

C. The above spacing for construction joints shall be required in lieu of the spacing indicated in Section 73, "Concrete Curbs and Sidewalks," of the State Standard Specifications.

D. Mowstrips may not be poured monolithically with sidewalks or other concrete improvements.

E. Score lines shall be one quarter of one inch (1/4") in depth and width.

F. In areas with existing joint patterns the Contractor and Inspector should collaborate and the inspector may approve an alternate joint pattern when necessary.

The City believes that the Plans and Specifications call out Construction Joint spacing that will prevent the appearance of shrinkage and temperature cracking or other cracking from appearing in locations other than the joints. However, it shall be the sole responsibility of the Contractor to appropriately place all joints to prevent the appearance of shrinkage and temperature cracking or other cracking. If the Contractor believes that a different joint spacing should be utilized, the Contractor shall present a revised joint plan to the Engineer for approval. If no revised joint plan is submitted, this will be the Contractor's verification that he is satisfied with the joint pattern shown on the Construction Documents. Any concrete with cracking in locations other than the joints that is determined to be unacceptable by the Engineer shall be removed and replaced by the Contractor at the Contractor's expense.

Any concrete improvements damaged by the Contractor during construction shall be replaced by the Contractor at the Contractor's expense. Any concrete improvements damaged or visibly disfigured by the public during construction including but not limited to footprints, markings, bike tracks, vehicles and other damage shall be replaced by the Contractor at the Contractor's expense.

The surface of sidewalks, curb ramps and driveway approaches shall be scored, stamped, or otherwise marked as shown on the Plans, Standard Drawings, Contract Specifications, or as directed by the Engineer, utilizing a scoring tool, which will leave the edges rounded. The construction of curb ramps shall include any special surfacing required to be affixed to the concrete surface including detectable warning surfaces.

Where steel dowels are set forth on the Plans or Standard Drawings to anchor proposed concrete curbs to existing pavement or other existing infrastructure, adhesives may not be substituted therefor.

38-6 Finish

Immediately upon stripping curb forms and prior to backfill, all rock pockets or honeycombs shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

Finish of concrete surface improvements shall be free from blemishes and shall be as follows:

A. Curbs - Trowel smooth and finish with a light broom.

B. Sidewalks and mowstrips – Finish with light broom.

C. Gutters, valley gutters and median caps -Finish with light broom.

D. Driveway approaches - Finish with a light broom.

E. Curb (accessibility) ramps - Finish with a heavy broom across the ramp slope or as indicated on the Standard Drawings.

F. Stamped Concrete – Shall be colored, sealed and constructed per the Specifications and Plans and as directed by the Engineer.

Broomed surfaces to be used by pedestrian traffic shall be broomed transverse to the line of traffic.

38-7 Tolerances

The top and face of finished curbs shall be true and straight and the top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. When a straightedge 10 feet long is laid on the top or face of the curb or on the surface or flow line of gutters, valley gutters, drive approaches or other concrete improvements the surface shall not vary more than 0.02 feet from the edge of the straightedge, except at designed grade changes or curves.

All improvements shall be constructed to the slopes and elevations shown on the plans.

Under No Circumstances shall any of the following requirements be violated regardless of tolerances listed in this section:

No sidewalk or curb ramp cross slope shall exceed 2.00 percent along the path of travel. No sidewalk slope shall exceed 5.00 percent in the direction of travel along the path of travel. No curb ramp shall have a slope in the direction of travel greater than 8.33 percent. All curb ramp landings shall have a slope of not greater than 2.00 percent in any direction. If concrete improvements violate any of these requirements or other ADA requirements in effect at the time of construction, the Contractor shall remove and correctly replace the concrete improvements to the proper grades and dimensions at his own expense.

38-8 Curing

All surface concrete improvements shall be cured by application of an approved curing compound in conformance with the requirements of Subsection 90-1.03B(3)B, "Curing Compound Method," of the State Standard Specifications and the Standard Drawings.

38-9 Backfilling

After removal of forms, the area adjacent to the newly constructed concrete improvement shall be cleaned of all surplus concrete and other debris and the area filled with clean earth suitable for planting (except in front of the gutter). Backfill shall be placed behind the curb prior to any excavation in the street area below the plane of the bottom of curb and gutter.

Where there is a planter strip between the curb and the sidewalk, the planter strip shall be filled to within 1 inch of the top of curb and sidewalk with clean earth suitable for planting where grass is to be placed. When the planter strip is to be filled with bark it shall be filled to within 2 inches of the top of curb and sidewalk with clean earth suitable for planting. The area of traffic divider (median) islands not to be capped with concrete shall be backfilled with clean earth suitable for planting to within 2 inches of a line extending between adjacent tops of curb.

38-10 Measurement

Unless otherwise specified in the Contract Specifications, concrete curb, concrete gutter, concrete vee gutter, alley gutter, concrete curb and gutter, and concrete mowstrip shall be measured by the lineal foot. Curb depressions and curb and gutters around curb ramps will be included in the measurement of length of concrete curb, or concrete curb and gutter, as the case may be.

Unless otherwise specified in the Contract Specifications, concrete sidewalks and curb ramps, concrete driveway approaches, concrete alley approaches, concrete valley gutters and concrete median caps shall be measured by the square foot. Measurement of concrete driveway approaches, concrete alley approaches, and curb ramps shall be made from the back of the curb to the back of the approach or sidewalk adjacent to said improvement. Measurement for curb ramps shall include the concrete from the beginning of the curb return to the end of the curb return where curb ramps are being constructed in accordance with the Standard Drawings or ramps are being constructed similar thereto.

38-11 Payment

Payment for Concrete Curb, Concrete Gutter, Concrete Curb and Gutter, Concrete Vee Gutter, and Concrete Mowstrip shall be at the unit price bid per lineal foot and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents, and as directed by the Engineer, including subgrade preparation.

Payment for Concrete Sidewalks and Curb Ramps, Concrete Driveway Approaches, Concrete Alley Approaches, Concrete Valley Gutters and Concrete Median Caps shall be at the unit price bid per square foot and shall include full compensation for furnishing all labor, materials, tools, equipment, special surfacing materials, detectable warning surfaces, and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents and as directed by the Engineer, including subgrade preparation.

Compensation for steel reinforcement required for drive approaches, concrete valley gutters or any other facilities requiring steel reinforcement shall be included in the cost for the facilities requiring said steel reinforcement. No additional compensation shall be made therefor.

SECTION 39 PERVIOUS CONCRETE PAVEMENT

39-1 General

SCOPE OF WORK: The Work to be completed under this Section includes the furnishing of all labor, materials and equipment necessary for construction of Pervious Concrete Pavement and Baserock including the aggregate baserock and the pervious concrete in conformance with the Plans and Specifications.

SPECIAL EQUIPMENT: Pervious concrete requires specific equipment for compacting, and jointing. Depending upon which placement method listed in section Placing and Finishing is selected, the specific tools listed below are required.

A. Placement by vibratory screed, laser screed, or hand screed

1. The surface shall be compacted to the final elevation by one of three methods.
    a. A minimum 10-inch diameter steel pipe that spans the width of the section placed and exerts a vertical pressure of at least 10 psi on the concrete surface shall be used to compact the concrete surface. Small, irregular areas may be compacted with smaller rollers that do not span edge to edge provided sufficient compaction is attained.
    b. A plate compactor having a minimum base area of 2 square feet and exerting a minimum vertical pressure of 10 psi on the concrete surface. Compaction may be accomplished by placing ¾" thick plywood over the screeded surface prior to application of the plate compactor.
    c. Single tube weighted roller.
    d. Sod rollers shall not be permitted for compaction of pervious concrete.

B. Jointing

1. When rolled joints are placed in pervious pavements, they shall be formed using a small roller to which a fin with a minimum depth of ¼ the thickness of the slab. The fin shall be welded to the circumference of the roller and finished with a smooth fillet or radius.
2. Joints may also be made by hand tooling or saw cutting to a depth of ¼ of the slab thickness.

C. Water fogger

1. Water fogging equipment shall emit a fine mist.
2. Equipment that produces large drops of water that wash cement paste off the aggregate shall not be used.

39-2 Quality Assurance:

The Pervious Concrete Subcontractor:

A. Shall submit:

1. Evidence of two successful pervious concrete pavement projects including: the project name and address, owner's name, contact information and size of each project.
2. Verification of current NRMCA Certification requirements described below:

B. Shall meet, at the time of bidding: one of the following criteria for the minimum certification for each placement crew and submit verification of NRMCA Pervious Concrete Certification with the bid.

(http://www.nrmca.org/Education/Certifications/Pervious_Contractor.htm)

1. The pervious concrete subcontractor shall employ no less than one (1) NRMCA Certified Pervious Concrete Craftsman who must be onsite, actively guiding and working with each placement crew during all pervious concrete placement.
2. The pervious concrete subcontractor shall employ no less than three (3) NRMCA Certified Pervious Concrete Installers who must be onsite, actively guiding and working with pervious concrete for projects.
3. The pervious concrete subcontractor shall employ no less than three (3) NRMCA Pervious Concrete technicians and one (1) Pervious Installer who shall be onsite, actively guiding and working with each placement crew during all pervious concrete placement.

SUBMITTALS:
Prior to commencement of the work the contractor shall submit the following:

A. Concrete materials:

   1. Proposed concrete mixture proportions including all material weights, volumes, density (unit weight), water cement ratio, and void content.
   2. Aggregate type, source and grading.
   3. Cement, fly ash and admixture manufacturer certifications

B. Qualifications: Evidence of qualifications listed under Quality Assurance

C. Project details: Specific plans, details, schedule, construction procedures and quality control plan.

D. Subcontractors: List all materials suppliers and subcontractors to be used on the project.

TEST PANELS:
Prior to construction, test panel(s) shall be placed and approved by the owner. The owner may waive this requirement based on contractor qualifications.

A. Test panel(s) shall be constructed in accordance with the plans and specifications. A minimum 200 sq. ft panel size shall be placed, jointed and cured using materials, equipment, and placing crew proposed for the project.

B. Test panel(s) cost and removal, if necessary, shall be included in the contract price for Pervious Concrete and Baserock.

C. Quality: Test panels shall have acceptable surface finish, joint details, thickness, porosity and curing procedures and shall comply with the acceptance criteria listed in the Quality Control section of this specification.

D. If test panels placed at the site are found to be deficient in thickness, density (unit weight) or percentage of voids, or of an unacceptable appearance, they shall be removed at the contractor's expense and taken to an approved landfill or recycling facility. If test panels are found to be satisfactory, they may be left in-place and included in the completed work.

39-3 Materials

Cement: Portland cement Type II or V conforming to ASTM C150 or Portland cement Type IP or IS conforming to ASTM C595.

SUPPLEMENTARY CEMENTITIOUS MATERIALS:

A. Class F Fly ash conforming to ASTM C618

B. Ground Iron Blast-Furnace Slag conforming to ASTM C989

CHEMICAL ADMIXTURES:

A. Air entraining agents shall comply with ASTM C260.

B. Chemical Admixtures shall comply with ASTM C494.

C. Hydration stabilizers are permitted to be used when it is necessary to increase concrete placement time to 90 minutes and improve finishing operations.

AGGREGATES:

A. Coarse aggregate shall comply with ASTM C33. Size 8 (3/8" to No. 16) or Size 89 (3/8 in. to No. 50) shall be used unless an alternate size is approved for use based on meeting the project requirements. The percentage of material passing the #4 sieve shall be no more than 10%. Fine aggregate complying with ASTM C33 shall not be used.

B. Larger aggregate sizes may increase porosity but can decrease workability. Avoid well graded aggregates as they may reduce porosity, and may not provide adequate void content.

WATER:
Water shall comply with ASTM C 1602.

MIXTURE PROPORTIONS:
The composition of the proposed concrete mixtures shall be submitted to the owner's representative for review and/or approval and shall comply with the following provisions unless an alternative composition is demonstrated to comply with the project requirements.

CEMENTITIOUS CONTENT:
Total cementitious content shall not be less than 630 lbs/cy, unless satisfactory performance with lower cementitious contents has been shown with the aggregates and cementitious material proposed for use.

SUPPLEMENTARY CEMENTITIOUS CONTENT: Fly ash: 15% maximum.

WATER / CEMENTITIOUS RATIO: Maximum 0.30 lb/lb.

AGGREGATE CONTENT:
The bulk volume of aggregate per cubic yard shall be equal to 24 cubic foot when calculated from the dry rodded density (unit weight) determined in accordance with ASTM C29 jigging procedure.

ADMIXTURES:
Admixtures shall be used in accordance with the manufacturer's instructions and recommendations.

39-4 Execution

FOUNDATION

A. SUBGRADE:

1. Material: The subgrade shall not be chemically treated .
2. Compaction: Compact sub-grade to a minimum 90% and a maximum 95%. Compaction shall be in accordance with ASTM D1557.
3. Moisture: The subgrade moisture content shall be 1% - 3% above optimum as determined by ASTM D1557.

B. AGGREGATE BASEROCK :

1. Material: Base material under the pervious concrete shall be 1" or ¾" maximum sized aggregate conforming to ASTM C 33, Size 5, 56, 57, 6 or 67 with a compacted void content of 30% to 40%.
2. Compaction: The aggregate base shall be compacted by proof rolling or plate compactor.

FORMWORK:

A. Form materials are permitted to be of wood or steel and shall be the depth of the pavement. Forms shall be of sufficient strength and stability to support mechanical equipment without deformation spreading, strike-off and compaction equipment. If final compaction of the concrete is with a non-hydraulic steel pipe or plate compactor, the forms shall have a removable spacer of ½" to ¾" thickness placed above the depth of pavement. The spacers shall be removed following placement and vibratory strike-off to allow surface compaction.

MIXING AND HAULING:

A. PRODUCTION: Pervious concrete shall be manufactured and delivered in accordance with ASTM C 94.

B. MIXING: Concrete mixed in truck mixers shall be mixed at the speed designated as mixing speed by the manufacturer for 75 – 100 revolutions.

C. TRANSPORTATION: The pervious concrete mixture may be transported and discharge of individual loads shall be completed within one (1) hour of the introduction of mix water to the cement. Delivery times may be extended to 90 minutes when a hydration stabilizer is used.

D. DISCHARGE: Each truckload will be visually inspected for consistency of the concrete mixture. To replace water lost to evaporation, water addition is permitted during discharge of the concrete to maintain the required mix consistency. A minimum of 70 revolutions at the manufacturer's designated mixing speed shall be required following the addition of any water to the mix. Discharge shall be a continuous operation and shall be completed as quickly as possible. Concrete shall be deposited as close to its final position as practical and such that discharged concrete is incorporated into previously placed plastic concrete.

PLACING AND FINISHING:

A. GENERAL: Pervious concrete shall be deposited over the entire width of the formed area and finished to the designed elevation. The completed pavement section shall contain at least the designed percentage of interconnected voids. Foot traffic shall be prohibited on the fresh pervious concrete during placement and prior to initial compaction.

B. PLACING METHODS: Pervious concrete shall be placed by vibratory screed, single tube hydraulic roller screed, laser screed, or slip form paver. The requirements for each method are specified below. The Contractor shall provide a mechanical vibratory form riding screed or a single tube hydraulic screed to place the concrete unless otherwise approved by the Owner or Engineer in writing. Internal vibration shall not be permitted.

1. Mechanical vibratory form riding screed. The screed shall ride on ½" to ¾" spacers affixed to the tops of the forms. After the concrete has been screeded, the spacers shall be removed and the surface consolidated using a roller or plate compactor. Care shall be taken during

compaction that sufficient compactive force is achieved without excessively working the concrete surface that might result in sealing off the surface porosity.

2. Single tube hydraulic roller. A water-filled steel tube driven by an external power source shall ride on the tops of the forms; spacers are not required but can be used at the contractor's option. Once the concrete is screeded to the final elevation, the screed is rolled over the pervious section to complete consolidation. Care shall be taken during installation and compaction that sufficient compactive force is applied without excessively working the concrete surface to the extent that the surface is sealed.

3. Laser screed. The pervious concrete shall be placed between forms and finished to the planned elevation using the laser machine's internal control system. After the concrete is placed, compactive effort shall be by a steel roller or a plate compactor.

4. Slip form paver. The concrete shall be placed with a spreader box the full-width of the formed section or with a full-depth asphalt paver. Compaction shall be by means of a roller screed or plate compacter.

C. The pervious concrete pavement shall be compacted to the required cross-section and shall not deviate more than +/- 3/8 inch in 10 feet from profile grade. Low spots after the screeding operation shall be filled up and tamped with hand tampers or re-rolled with compacting devices. Placed concrete shall not be disturbed while in the plastic state. Foot traffic shall not be permitted on the uncompacted surface

D. Hand tampers shall be used to compact the concrete along the slab edges immediately adjacent to the forms. After compaction, inspection, and repair, no further finishing shall be performed on the concrete. The surface shall be water fogged prior to covering with 6 mil visqueen. The surface shall be covered immediately and in no case more than 20 minutes after the concrete has come in contact with the grade.

E. The placement at the conclusion of each truck's discharge, the concrete shall be squared off. If the next truck is not immediately available for discharge, the concrete shall be formed and treated as a construction joint. Prior to restarting placement, the form board shall be removed and the exposed face fogged with water prior to continuing the placement.

JOINTING:

A. Control (contraction) joints shall be installed at regular intervals not to exceed 40 feet, or two times the width of the placement. The control joints shall be installed at 1/4 the depth (to a maximum depth of 1½") of the thickness of the pavement. These joints can be installed in the plastic concrete or saw cut after the concrete has hardened.

B. Jointing plastic concrete: Joints installed in the plastic concrete shall be constructed utilizing a small roller as described in section Special Equipment or by hand tooling. When this option is used it shall be performed immediately after roller compaction and prior to curing.

C. Jointing hardened concrete: Saw-cuts shall be made as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking. Early entry sawing occurs later with pervious concrete than with conventional concrete. For either method, the curing cover shall be removed and the surface kept misted to prevent moisture loss. After sawing the concrete shall be thoroughly wetted before the curing cover shall be securely replaced for the remainder of the curing cycle.

D. Transverse construction joints: Transverse construction joints shall be installed whenever placing is suspended or whenever concrete is no longer workable.

CURING:

A. Immediately after screeding, the surface shall be kept moist and evaporation prevented. When the wind is in excess of 5 mph, the surface shall be treated with a spray applied curing compound, evaporation retarder, or water fogging prior to covering with a minimum of six (6) mil thick polyethylene sheet or other approved covering material. The six mil polyethylene sheet or other approved curing material shall be placed over the compacted concrete no later than 20 minutes after the concrete has come into contact with the grade. The cover shall extend at least 8" beyond the edges of the fresh concrete and shall be secured to prevent evaporation of water in the concrete and dislocation due to winds or adjacent traffic conditions.

1. The curing cover shall remain securely in place for a minimum of 7 days. No vehicular traffic shall be permitted on the pavement until curing is complete and no truck traffic shall be permitted for at least 14 days.

39-5 Quality Control:

A. For Public Projects the City shall employ a testing laboratory that conforms to the requirements of ASTM E329 and ASTM C1077. For Non-Public Projects the Contractor shall employ the testing laboratory to perform all testing. All personnel engaged in testing shall be certified by the American Concrete Institute as ACI Concrete Field Technicians or equivalent. Pervious concrete placement inspectors shall be certified by the National Ready Mixed Concrete Association as a "Pervious Concrete Technician".

B. Traditional Portland cement pavement testing procedures for strength and slump control are not applicable to this type of pavement material.

C. Concrete tests shall be performed for each 150 cubic yards or fraction thereof with a minimum of one test for each day's placement.

D. Hardened concrete shall be tested for in-place infiltration rate.

1. The infiltration rate shall be not less than 100 inches per hour when measured using the following procedure:
   The apparatus shall consist of a:
   a. One gallon, minimum size, water container with a spout. The spout shall be able to produce a stream with a circular cross-section and large enough in diameter to discharge the entire contents of the container in 20 seconds or less.
   b. Stopwatch capable of indicating elapsed time to the nearest second.
   c. Tape measure of at least 0.95 m (36 inches) that is graduated in 5 mm (1/4 inch) increments or smaller.
   d. The water shall be free of suspended solids. The volume of water shall be determined to two significant figures
   e. The testing procedure is:
      i. Place a pre-measured amount of water into the container.
      ii. Pour the water onto the pervious concrete surface. Control the discharge rate by manually adjusting the angle of the spout so that the pooling of water on the concrete surface is between 25.4 cm to 76.2 cm (10 to 30 inches). Pour the entire contents of the container onto one spot and hold the spout over the spot until the pool of water vanishes.
      iii. Start the stopwatch when the water initially touches the concrete surface and stop it when the pool disappears from the surface.

iv. Measure the longest dimension of the dampened area. Measure the width of the pool perpendicular to the first measurement.
v. Repeat this procedure in a minimum of 4 separate locations.

f. The calculation of the Infiltration Capacity shall be as follows:
   i. The formula for SI Units is: IC= (V) (14.4X106)/ (pi) (d1) (d2) (t) inches per hour.
   ii. The formula for U.S. Standard Measures is: IC=(V)(3,326,400)/(pi)(d1)(d2)(t) inches per hour

   Where:
   IC is Infiltration Capacity
   V is the volume of water in gallons or liters
   d1 and d2 are the dimensions that were determined in part iv.
   pi is about 3.14159

g. The test report shall include at a minimum:
   i. The time and date of testing.
   ii. The name and affiliation of the person performing the test.
   iii. The location of the site being tested.
   iv. The location of each site tested.
   v. The volume of water used at each test site.
   vi. The length of the two measurements taken at each site.
   vii. The discharge time for the water at each location.
   viii. The infiltration capacity at each location.
   ix. The average infiltration capacity for the site.

39-6 Measurement and Payment

Payment for Pervious Concrete Pavement and Baserock shall be made at the Contract Unit Price per square foot paid for Pervious Concrete Pavement and Baserock and shall include, but not be limited to, full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and doing all work involved in preparing the subgrade, hauling and constructing pervious concrete pavement and aggregate baserock, completed in place, in accordance with these Specifications and as shown on the approved Plans.

SECTION 40 (RESERVED)

SECTION 41 CHAIN LINK FENCE, GATES & TIMBER BARRICADES

41-1 General

This work shall consist of constructing chain link fence and gates at locations and in accordance with the details shown on the Plans and Standard Drawings, as specified in the Specifications, and as directed by the Engineer. Concrete mowstrips for fences shall conform to Section 38, "Concrete Curbs, Sidewalks, Surface Improvements." The work shall also consist of constructing timber barricades at the locations shown on the Plans, and in accordance with the applicable Standard Drawing and the Specifications.

41-2 Materials

All fence and gate materials shall be new, galvanized ferrous materials. Imperfectly galvanized material or material upon which serious abrasions of the galvanizing occur shall not be used in the work. A certificate of compliance is required from the manufacturer of all products used in constructing chain link fence and gates, including posts, and shall be submitted to the Engineer in conformance with Section 6-5, "Certificates of Compliance."

All timber shall be new and first quality and shall be redwood or pressure treated wood with a preservative may be substituted for redwood upon the approval of the Engineer.

41-2.1 Fence, Gate, Posts

Fence, gate, and post materials shall comply with the following:

A. Height: The fence shall stand at a height of 6 feet above the grade indicated on the Plans when erected.

B. Fabric: Chain link fence and gate fabric shall conform to the specifications of ASTM Designation A392, Class 1 zinc coating. The wire used in the manufacture of the fabric shall be 9 gauge, and woven into approximately 2 inch mesh. The fabric shall have a knuckle bottom and twisted top.

C. Posts and Braces: The base material for the manufacture of steel pipe used for posts and braces shall conform to the specifications of ASTM Designation A120, standard weight, and the base material for the manufacture of other steel sections used for posts and braces shall be good commercial quality weldable steel. Posts and braces shall be galvanized in accordance with ASTM Specification Designation A123.

Posts and braces shall conform to the following requirements:

Corner and End Posts (round pipe only):

Pipe: 2-7/8 in. outside diameter (O.D.); 5.79 lb./ft. weight

Line Posts:

Pipe: 1.90 in. O.D.; 2.72 lb./ft. weight

Gate Posts (round pipe only):

Individual Gate Width	O.D.	Weight
Up thru 6 ft.	2-7/8 in.	5.79 lb./ft.

7 ft. thru 13 ft.	4 in.	9.11 lb./ft.
14 ft. thru 18 ft.	6-5/8 in.	18.97 lb./ft.
Over 18 ft.	8-5/8 in.	24.70 lb./ft.
Braces:		
Pipe:	1-5/8 in. O.D.;	2.27 lb./ft. weight

All posts shall be fitted with rainproof caps designed so as to fit securely over the top of the posts, and carry the top tension wire.

All line posts shall be of a total length of not less than 8.5 feet and all other posts shall be of a total length of not less than 9 feet as shown in the Standard Drawings, except that where post caps are used which hold tension wires, the post may be shortened a sufficient amount so that the top of the cap is at the approximate level of the fence fabric, but no lower. In no case, however, shall the post be shorter than 8 feet-8 inches where post caps are used, nor shall the length embedded in the concrete footing, including any mowstrip, be less than 2.5 feet for line posts and 3 feet for all other posts.

Reference is made to Section 6-8, "Samples and Tests," which is modified in this Section 41-2.1. In addition to any of the requirements of said Section 6-8, one post from each lot of posts, and one brace from each lot of braces, to be used in the work shall, at the direction of the Engineer, be tested in accordance with the requirements of ASTM Designation A120. If that post or brace fails, 2 additional posts or braces from the same lots will be tested. If either of the 2 additional sampled posts or braces fails, the entire lot of posts will be rejected. The Contractor shall supply materials for testing, as required, at his own expense.

41-2.2 Extension Arms, Tension Wire, Wire Strands

A. Extension arms, stretcher bars and other required fittings and hardware: Extension arms, stretcher bars and other required fittings and hardware shall be steel or malleable iron or wrought iron and shall be galvanized in accordance with ASTM Specification Designation A153.

B. Tension wires: Tension wires shall be a minimum of 7 gauge coil spring steel of good commercial quality. Tie wires and hog rings shall be at least 9 gauge steel. Post clips shall be at least 6 gauge steel. Tension wires, tie wires, post clips, and hog rings shall be galvanized in accordance with the provisions of ASTM Specification Designation A116, Coating Class 3.

C. Wire Strands for Extensions: Wire strands for extensions shall be 9 gauge (3.8 mm) diameter galvanized steel of a good commercial quality. Three strands shall be installed where extensions are called for on the Plans.

41-2.3 Gates

Drive gates may be single or double, and shall be of the widths designated on the Plans and in the Contract Pay Item. Walk gates shall be 4 feet wide. Gates shall be constructed in accordance with the Standard Drawings.

Gate frames shall be constructed of not less than 1.90 inch inside diameter galvanized standard weight pipe conforming to ASTM Specification Designation A120. Gate frames shall be cross trussed with 3/8

inch diameter adjustable truss rods. The adjuster shall be provided with flat and lock washers and shall be "double-nutted" to lock the adjuster. The corners of gate frames shall be fastened together and reinforced with a malleable iron fitting designed for the purpose, or they may be welded and regalvanized as provided herein.

All abraded and damaged galvanized surfaces or welded areas shall be regalvanized or may be cleaned and painted with two coats of zinc oxide, zinc dust paint conforming to the requirements of Federal Specification MIL-P-15145, the paint to be properly compounded in a suitable vehicle in the ratio of one part zinc oxide to 4 parts zinc dust, by weight.

Chain link fence fabric specified for the fence shall be attached to the gate frame by the use of stretcher bars and the tie wires as specified for fence construction, and suitable tension connectors spaced at approximately one foot intervals.

The gates shall be hung by at least two steel or malleable iron hinges not less than 3 inches in width, so designed as to securely clamp to the gate posts and permit the gate to be swung back against the fence.

Gates shall be provided with a combination steel or malleable iron catch and locking attachment of approved design. Stops to hold gates open and a center rest with catch shall be provided for all double gates. Walk gates shall be provided with stops only.

41-2.4 Concrete

Concrete for post footings shall be Class 3 conforming to the requirements of Section 50, "Portland Cement Concrete," of these Specifications.

41-2.5 Timber

Timber for Timber Barricades shall conform to the requirements shown on the Standard Drawing for Temporary Timber Barricade.

41-3 Clearing and Grubbing

Clearing and Grubbing shall conform to the requirements of Section 16, "Clearing and Grubbing."

41-4 Excavation and Preparation Of Subgrade

Any required excavation or embankment construction shall be to the lines and grades shown on the Plans or established by the Engineer. Excavation, embankment construction and preparation of subgrade shall conform to the requirements of Section 19, "Earthwork." Unless otherwise indicated, minimum relative compaction of finished fence pad shall be 90 percent.

The area around each gate shall be graded to allow all gates to be swung back against the fence without dragging on the ground surface.

41-5 Construction

A. Chain Link Fence, Gates.

Line posts shall be spaced not farther apart than 10 feet from center to center, and unless otherwise specified, shall be set vertically. All posts shall be set in concrete footings conforming to details show on the Standard Drawings. Unless otherwise directed by the Engineer, footings shall be crowned at the top to permit water to flow away from the posts.

End, corner and gate posts shall be braced to the nearest line post as shown on the Standard Drawings, with horizontal braces used as compression members and galvanized 3/8 inch diameter steel adjustable truss rods used as tension members. The adjuster shall be provided with flat and lock washers, and shall be "double-nutted", as directed by the Engineer, to lock the adjuster. Where the distance between corner and/or gate posts is 1,000 feet or greater, line posts shall be braced horizontally and trussed in both directions at intervals not to exceed 1,000 feet, as shown on the Standard Drawings. The tension wires shall be interrupted at this location by cutting and attaching them to one of the braced line posts. Tension wires shall then be continued from this same line post to the next corner or gate post.

Changes in line where the deflection angle is 10 degrees or more shall be considered as corners, and corner posts with bracing specified for corners shall be installed.

Chain link fabric shall be fastened on the outside of the posts surrounding the area being fenced, unless otherwise directed by the Engineer.

The fabric shall be stretched and securely fastened to the posts, and between posts the top and bottom edges of the fabric shall be fastened to the tension wires. Tension wires shall be stretched tight and attached to corner or gate posts in a manner approved by the Engineer.

The fabric shall be fastened to end, corner and gate posts with 1/4 inch wide by 3/4 inch thick stretcher bars and not less than 1/8 inch wide by 3/4 inch thick stretcher bar bands spaced at 1 foot intervals. The fabric shall be fastened to line posts with tie wires or post clips and to tension wires with tie wires or hog rings. The wire or clip fasteners shall be spaced 14 inches apart on line posts, with a minimum of 6 per post, and 18 inches apart on tension wires.

All bolted fixtures, including gate hinge attachments, turnbuckles, or other adjusters, clamps, or any device which is bolted, shall be provided with flat washers behind bolt heads, except where stove bolts are used, and flat and lock washers behind nuts. All turnbuckles or other adjusters shall be "double-nutted" to lock the adjuster.

Where post extensions and strands of wire are specified, the wire shall be stretched tight and fastened to extension arms with tie wires or hog rings. Where the wire terminates, it shall be securely tied to the extension arm.

B. Timber Barricades.

Timber Barricades shall be constructed at the locations shown on the Plans and conforming to the details shown on the Standard Drawing for Temporary Timber Barricade. Use of the word “Temporary” shall not be confused with smaller barricades used for traffic delineation.

Clearing and grubbing for Timber Barricades shall conform to Section 16, “Clearing and Grubbing.” Excavation and preparation of subgrade shall comply with Section 19, “Earthwork.” Excavations for posts shall be backfilled and thoroughly compacted to the satisfaction of the Engineer.

41-6 Measurement

Measurement for 6-foot chain link fence will be by the lineal foot of chain link fence installed as shown on the Plans, to be determined by the Engineer from actual measurements, the width of gate openings being deducted.

Measurement of gates will be per each for each type of gate installed as shown on the Plans. A gate unit complete in place shall include one gate, or in the case of double gates, one double unit, with all necessary fittings, hardware, and gate posts with braces, latches, stops, and other devices required by the Standard Drawings, Plans or Specifications.

Measurement for Timber Barricades shall be on an a per each basis.

41-7 Payment

When the Contract does not include a pay item for clearing and grubbing, or for excavation and preparation of subgrade as above specified, and unless otherwise provided in the Contract Specifications, full compensation for any necessary clearing and grubbing, and any excavation and preparation of subgrade required to prepare the fence pad to the grades shown on the Plans or directed by the Engineer shall be included in the costs for the various fence construction items of work and no separate payment will be made therefor.

Payment for 6 Foot Chain Link Fence shall be paid at the unit price bid per lineal foot and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans and Standard Plans, as set forth in the Specifications, and as directed by the Engineer. This shall include clearing and preparing the fence pad (where no separate item is provided therefor), furnishing and installing the fence and posts, providing samples and tests, furnishing and installing post extension arms and strands of wire where indicated, and all incidentals required to provide a complete fence installation as specified.

Payment for each type of Gate or Double Gate shall be paid on a per each basis and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans and Standard Drawings, as set forth in the Specifications, and as directed by the Engineer. This shall include clearing and preparing the gate opening area (where no separate item is provided therefor), furnishing and installing gates, providing samples and tests, furnishing and installing post extension arms and strands of wire where indicated, and all incidentals.

Payment for Timber Barricades shall be paid on a per each basis shall include full compensation for all labor, tools, materials, and incidentals required for the complete installation as shown on the Plans and applicable Standard Drawings, and as specified in the Specifications, including paint and reflectors.

SECTION 42 CONCRETE MASONRY WALL/FENCE (RESERVED)

SECTION 43 FIBER OPTIC FACILITIES (RESERVED)

SECTION 44 (RESERVED)

SECTION 45 SIGNALS, LIGHTING, AND ELECTRICAL SYSTEMS

45-1 Description

Furnish and install all equipment, materials, and components for traffic signals and lighting system, pursuant to the provisions of the State Standard Specifications Section 86, "Electrical Systems", the State Standard Plans, these Specifications and the Special Provisions.

Special Note: Due to the limited stock inventory of traffic signal poles and associated equipment it is taking a significant length of time for manufacturers to fabricate and deliver signal poles and associated equipment to the job sites. The Contractor shall order all traffic signal poles and associated equipment immediately after the Notice to Proceed is issued and the submittal is approved by the engineer in order to complete the work within the allotted construction duration noted in these specifications.

45-2 Equipment List and Drawings

The controller cabinet schematic wiring diagram and intersection sketch shall be combined into one (1) drawing so that when the cabinet door is fully open, the drawing is oriented with the intersection.

The Contractor shall furnish a maintenance manual for all supplied controller units, auxiliary equipment and vehicle detector sensor units, control units, and amplifiers. The maintenance manual and operation manual may be combined into one (1) manual. The Maintenance Manual or combined Operation and Maintenance (O&M) Manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, previous to purchase. The Maintenance Manual shall include, but need not be limited to, the following items:

A. Specifications,

B. Design characteristics,

C. General operation theory,

D. Function of all controls,

E. Trouble-shooting procedure (diagnostic routine),

F. Block circuit diagram,

G. Geographical layout of components,

H. Schematic diagrams,

I. List of replaceable component parts with stock numbers.

45-3 Certificate of Compliance

The Contractor shall provide the Engineer with a "Certificate of Compliance" from the manufacturer in accordance with the provisions of Section 6-5 "Certificates of Compliance" for all electrical material and equipment.

45-4 Foundations

Foundations shall conform to the provisions in Section 86-2.03, "Foundations," of the State Standard Specifications and these Specifications. Concrete shall have a minimum 28-day compressive strength 3,600 psi. Concrete must contain not less than 590 pounds of cementitious material per cubic yard. The combined aggregate grading must comply with the 1-inch maximum grading, the 1/2-inch maximum

grading, or the 3/8-inch maximum grading specified in Section 90-1.02C(4) of the State Standard Specifications.

No admixtures shall be used without written permission from the City. All concrete shall have a surface finish that is uniform texture and appearance without out bulges, depressions, or other imperfections.

The controller cabinet base shall be 8 inches higher than the surface of controller cabinet pad or sidewalk. Controller pad shall be 0.1 foot above finished grade if placed in unpaved area, unless elevation is stated on plans. If the pad is located in an existing or future sidewalk area, pad shall be placed at sidewalk elevation. The controller cabinet foundation shall be constructed to place the police panel on the cabinet facing the adjacent street. Controller cabinet base shall be Class 2 conforming to Section 50, "Portland Cement Concrete," of the Specifications.

Foundation caps for signal standard bases not in existing sidewalk area shall be as follows:

Pedestrian Push Button posts shall be 18 inch square or round,
Type I-A shall be 24 inch square or round, and
All other foundation caps for signal standard bases shall be 30 inch square or round.

If a square foundation cap is used, the sides of the cap shall be parallel or at right angles to road center line. Foundation caps shall be 3.5 inches in thickness. Top of all foundation caps for signal posts and standards shall be at sidewalk elevation or as stated on plans or as directed by the City Engineer.

After installation of signal standards, anchor bolt threads shall extend three threads beyond the top of the nut.

A mortar mix shall be furnished and placed in recesses and holes between the top of the foundation and the bottom of the base plate. The mortar shall be trowel finished with vertical sides matching the shape of the base plate. The mortar shall be composed of one part Portland Cement and two parts sand by volume. The mortar shall contain only enough water to permit placing and packing. The sand shall be well graded and of such size that all will pass a No. 8 sieve.

The exact location of all foundations for signal equipment, controller and service enclosures shall be approved by the Engineer prior to the start of any excavation work.

45-5 Miscellaneous Concrete Construction and Removal

Contractor shall coordinate traffic signal and lighting construction with access ramp construction to minimize the amount of miscellaneous concrete construction and removal.

Removing concrete shall conform to the provisions in Section 15, "Removing Existing Facilities," of these Specifications and the Special Provisions.

Where no joint exists between concrete to be removed and concrete to remain in place, the concrete shall be cut in a neat line to a minimum depth of seventeen-hundredths of one foot (0.17') with a power-driven saw before concrete is removed. Curb, gutter, and sidewalk shall conform to the provisions in Section 38, "Concrete Curbs, Sidewalks, Surface Improvements".

45-6 Standards, Steel Pedestals, and Posts

Section 86-2.04, "Standards, Steel Pedestals, and Posts," of the State Standard Specifications is amended by adding the following after paragraph seven of Section 86-2.04B(2) "Bolted Connections":

All galvanized nuts used on assemblies with a specific pre-load or torque shall be lubricated in accordance with the requirements specified for galvanized Grade DH nuts in ASTM Designation: A563.

The sign-mounting hardware shall be installed at the locations shown in the approved Construction Drawings. The sign panels shall be furnished by the Contractor.

Where the approved Construction Drawings refer to the side tenon detail at the end of the signal mast arm, the applicable tip tenon detail may be substituted.

45-7 Conduit

All conduit shall be Type 3 Rigid nonmetallic PVC conduit as specified in Section 86-2.05A "Material", of the State Standard Specifications. All conduit shall have a #12 tracer wire installed.

Conduit shall be installed by jacking or drilling in accordance with Section 86-2.05C "Installation" of the State Standard Specifications. Installation of conduit by the trenching method will only be permitted when requested by the Contractor, in writing, and approved by the Engineer. When used, the trenching method shall be as provided below.

Conduit runs shown in the approved Construction Drawings to be located behind curbs may be installed in the street, within three feet (3') of and parallel to the gutter line of the curb, by trenching as provided below. All pull boxes shall be located behind the curb or at the location shown in the approved Construction Drawings.

After conductors have been installed, the ends of conduits terminating in pull boxes and in service and controller cabinets shall be sealed with an approved type of sealing compound.

At locations where conduit is to be installed by jacking or drilling as provided in Section 86-2.05C "Installation" of the State Standard Specifications, and if delay to any vehicle will not exceed five (5) minutes, conduit may be installed by the trenching method, where approved by the Engineer, as follows:

A. Trenching Installation of Conduit:

Conduit shall be placed under existing pavement in a trench approximately two inches (2") wider than the outside diameter of the conduit to be installed. Trench shall not exceed six inches (6") in width. Conduit depth shall not be less than twenty-four inches (24") in depth, except that at pull boxes the trench may be hand dug to required depth. The outline of all areas of pavement to be removed shall be cut to a minimum depth of three inches (3") with a rock-cutting excavator specifically designed for this purpose. Cuts shall be neat and true with no shatter outside the removal area. The conduit shall be placed in the bottom of the trench, and the trench shall be backfilled with two-sack slurry cement, conforming to Section 19-3.3.C. The top of slurry mix shall be two inches (2") below A.C. Pavement, after slurry mix has set-up, the trench shall be patched with one-half of one inch (½") aggregate gradation mix HMA per Section 28.

Prior to spreading HMA, paint binder shall be applied as specified in Section 28-6.3 "Tack Coat." Spreading and compacting of HMA shall be performed by any method that will produce an HMA surfacing of uniform smoothness, texture, and density.

All excavated areas in the pavement shall be backfilled, except for the top two inches (2"), by the end of each work period.

45-8 Pull Boxes

Pull boxes shall be of the type or model shown on the Plans and conforming to the provisions in Section 86-2.06, "Pull Boxes," of the State Standard Specifications and these Specifications. Pull boxes, covers and extensions shall be precast reinforced concrete, except as shown on plans or in the standard drawings. Grout shall be placed in bottom of each pull box.

45-9 Conductors And Wiring

Conductors and wiring shall conform to the provisions in Section 86-2.08, "Conductors and Cables", Section 86-5.01A(3), "Construction Materials", and Section 86-2.09, "Wiring", of the State Standard Specifications and these Specifications.

Splices shall be insulated by "Method B."

45-10 Signal Cable

Where shown in the approved Plans, signal cable shall be installed in lieu of individual conductors.

Signal cable shall conform to the following:

A. The cable jacket shall be black polyethylene with an inner polyester binder sheath and shall be rated for 600 volts and seventy-five degrees Fahrenheit (75° F). All cables shall have clear, distinctive, and permanent markings on the outer surface throughout the entire length of the cable showing the manufacturer's name or trademark, insulation designation, number of conductors, conductor sizes, and the voltage rating of the jacket. Filler material, if used, shall be polyethylene material.

B. Individual conductors in the cable shall be solid copper with Type THWN insulation and shall conform to the requirements in Section 86-2.08, "Conductors and Cables" of the State of California Standard Specifications and ASTM Designation: B 286. The minimum thickness of Type THWN insulation, at any point, shall be thirteen millimeters (13 mils) for conductor sizes No. 14 and No. 12, and eighteen millimeters (18 mils) for conductor size No. 10. The minimum thickness of the nylon jacket shall be four millimeters (4 mils) at any point.

C. Each signal cable shall be marked in each pull box showing the signal standard to which it is connected.

45-11 Service

The new service shall conform to the following:

A. The service equipment enclosure shall be fabricated from aluminum as per Section 86-2.11 of the State of California Standard Specifications. The cabinet door shall have a two thousand pound (2,000 lb.) stress rated aluminum hasp, welded to the cabinet door.

B. Service cabinets, conduits, and pull boxes shall not be installed until the service locations have been verified by the servicing utility.

C. It shall be the Contractor's responsibility to verify the location of and make arrangements for and to pay for all costs to provide the necessary connection for the traffic signal and safety lighting service.

D. The Contractor shall install all necessary service cabinets, conduits and pull boxes to provide electrical service as the first item of construction. AFTER SERVICE HAS BEEN INSPECTED AND TAGGED BY THE CITY, the Contractor shall, within forty-eight (48) hours, request

electrical service from Southern California Edison Company by phone and letter. A copy of the letter shall be sent to the Engineer.

45-12 Functional Testing

The functional test for each lighting system shall consist of not less than fourteen (14) days. If unsatisfactory performance of the system develops, the conditions shall be corrected and the test shall be repeated until the fourteen (14) days of continuous, satisfactory operation is obtained.

45-13 Painting

All exposed metal signal sections, signal head mountings, brackets and fittings, doors, visors, backplates, pedestrian push-button housings, and pedestrian signal sections shall be powder coated by a City-approved process, in lieu of painting.

The minimum requirements are as follows:

A. A 3-5 stage pretreatment consisting of:

1. Degrease
2. Rinse
3. Iron Phosphate
4. Rinse
5. Seal

Note: Items "1" and "3" can be combined thereby eliminating item "C", making this a three-stage process.

B. A dry-off cycle for at least ten (10) minutes at three hundred degrees Fahrenheit (300° F) to four hundred degrees Fahrenheit (400° F).

C. Electrostatically applied powder at 75-90KV.

D. Thermal setting cycle for twenty (20) minutes at four hundred degrees Fahrenheit (400° F).

All parts shall be coated with an ultraviolet-resistant polyester powder. The only exception is for items of flat black that can be coated with a self-cleaning flat black epoxy.

Contractor shall furnish manufacturer's "Certificate of Compliance" with City-approved powder coating process prior to installation of equipment.

45-14 Model 170E Controller Assemblies

Model 170E controller assembly or assemblies shall be furnished by the Contractor. Controllers shall be tested and certified in accordance with Section 86-3, "Controller Assemblies" of the State Standard Specifications and shall be warranted for a period of one (1) year from date of "turn-on."

In addition to the provisions in Section 86-3.01A, "General" of the State Standard Specifications, the complete control system, including the Model 332 cabinet, shall conform to the State Standard Specifications and any subsequent addenda.

The above-referenced document is available from State of California, Bids and Documents Section, in Sacramento for a fee.

The controller cabinet shall be fabricated from aluminum as specified in Section 86-3.04, "Controller Cabinets", of the State Standard Specifications.

The controller assembly shall include a pull-out shelf with internal document storage compartment mounted below the 170E controller position.

Conflict monitor shall be Model 210-P.

The Contractor shall supply the Model 170E controller. The controller unit shall be furnished complete with a Model 412C PROM module configured for Method No. 2, Memory Select No. 4. A full complement of EPROM chips shall be furnished for the controller program module. The software program will be furnished by the City. Two (2) complete manuals and four (4) complete cabinet wiring diagrams shall be supplied in accordance with the above-referenced Specifications and any subsequent addenda.

The Contractor shall provide extra equipment to the City as follows:

A. One (1) extra Model 170E controller.

The Contractor shall furnish and install all other components necessary for proper operation of the traffic signal system, including but not limited to, power supply, switch packs, and loop detector amplifiers.

The signal controller shall include a standard communications protocol which meets or exceeds the requirements of AB 3418 as specified by Caltrans. This protocol shall be selectable by the user as an alternative to the normal protocol when communications with a master supporting the AB 3418 protocol is desired. The AB 3418 protocol in the controller shall not substitute for or alter the operation of the normal communications protocol without the written approval of the Engineer. The normal communications protocol shall be the default protocol enabled on controller start up. Contractor shall certify, in writing, that the controller software complies with -AB 3418.

The protocol shall include support for uploading system detector data using the optional message defined for that purpose.

The Contractor shall arrange to have a Signal Technician, qualified to work on the control equipment and employed by the control equipment manufacturer or his representative, present at the time the equipment is turned on.

Note: Key all locks to match standard City keys. Controller cabinet lock shall match standard City controller cabinet key. Police panel lock shall match standard City police panel key. Battery backup cabinet lock shall match controller cabinet key.

45-15 Modulated Light Signal Detection System

A. A Tomar 2000 Series or better, emergency vehicle pre-emption system shall be installed. The system shall include four (4) detectors mounted on traffic signal mast arms, cable, and any other necessary hardware and/or software to operate the system. The cabinet shall include two (2), 2-channel emergency vehicle pre-emption phase selectors (discriminators) per these Specifications.

B. The modulated light signal detection system shall conform to these plans and specifications.

C. The modulated light signal detection system shall be a Tomar 2000 Series, or approved equal. Cable shall not be spliced between controller and detector and shall be Model 138 or approved equal.

D. Detectors shall be mounted on traffic signal mast arms and shall be centered over the number one lane.

E. The Contractor shall provide extra equipment to the City as follows:

1. One (1) extra optical detector head.

F. System Operation—The Contractor shall demonstrate that all of the components of each system are compatible and will perform satisfactorily as a system. Satisfactory performance shall be determined using the following test procedure:

1. Each system to be used for testing shall consist of an optical emitter assembly, an optical detector, at least two hundred feet (200') of optical detector cable, and a phase selector (discriminator) module.
2. The phase selector (discriminator) modules shall be properly installed in the cabinet.
3. Two (2) tests shall be conducted; one using a Class I signal emitter and a distance of one thousand feet (1,000') between the emitter and the detector, the other using a Class II signal emitter and a distance of one thousand eight hundred feet (1,800') between the emitter and the detector. All range adjustments on the module shall be set to "Maximum" for each test.
4. Each above test shall be conducted for a period of one (1) hour, during which the emitter shall be operated for thirty (30) cycles, each consisting of a one (1) minute "on" interval and a one minute "off" interval. During the total test period,

    a. The emitter signal shall cause the proper responses from the controller unit during each "on" interval

    b. There shall be no improper operation of either the controller unit or the conflict monitor during each "off" interval.

G. Certificates and Warranties – Manufacturers' certificates and warranties shall be presented to the City inspector before traffic signal turn-on.

45-16 Vehicle Signal Faces and Signal Heads

Signal faces, signal heads, and auxiliary equipment as shown in the approved Construction Drawings, and the installation thereof, shall conform to the provisions in Sections 86-4.01 "Vehicle Signal Faces", 86-4.01E "Backplates", and 86-4.04 "Signal Mounting Assemblies" of the State Standard Specifications and these Specifications.

All vehicular signals shall be the "incandescent looking" light emitting diode type, similar to the Leotek Caltrans Series Incandescent Look type, or approved equal. All green and yellow sections shall be provided with a Light Emitting Diode Kit that conforms to Section 45-17 of these Specifications. All red sections shall be provided with a Light Emitting Diode Kit that conforms to Section 45-18 of these Specifications.

Visors on vehicular signals shall be "tunnel" type with open slot at bottom.

All signal heads, housings, directional louvers, visors, and backplates shall be metallic. All vehicle signal lenses shall be twelve inches (12") in diameter.

45-17 Light Emitting Diode Green and Yellow Module

All twelve inch (12") green and yellow circular sections and twelve inch (12") green and yellow arrow sections shall be provided with Type 1 LED Traffic Signal Modules.

All devices must meet the general specifications of the Transportation Electrical Equipment Specifications (TEES), Chapter 1- General Specifications, as well as these Specifications. In case of conflict, these Specifications shall govern over the TEES, Chapter 1 Electrical Power Consumption.

Maximum power consumption requirements are as follows:

GREEN LEDs:

Temperature	77° F	166° F
12" circular	12.0 W	12.0 W
12" arrow	13.0 W	13.0 W

YELLOW LEDs:

Temperature	77° F	166° F
12" circular	22.0 W	25.0 W
12" arrow	10.0 W	12.0 W

A. Operation Voltage:

The modules shall operate from a 60 HZ, ±3 HZ AC, line over a voltage ranging from 95 volts to 135 volts. The fluctuations of line voltage shall have no visible effect on the luminous intensity of the indications.

Operating voltage of the modules shall be 120 VAC. All parameters shall be measured at this voltage.

B. Power Factor:

The LED signal module shall have a power factor of nine-tenths (0.90) or greater.

C. Total Harmonic Distortion (THD):

Total harmonic distortion (current and voltage) induced into an AC power line by a LED signal module shall not exceed twenty percent (20%).

D. Surge Suppression:

The signal module onboard circuitry shall include voltage surge protection to withstand high repetition noise transients as stated in Section 2.1.6 of NEMA Standard TS-2, 1992.
The LED circuitry shall prevent perceptible flicker to the unaided eye over the voltage range specified above.

All wiring and terminal blocks shall meet the requirements of Section 13.02, "Equipment and Material Standards" of the ITE Publication.

The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors). Review TEES Chapters 3 and 6 for specifications on these devices.

The modules and associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

E. Photometric Requirements:

The minimum initial luminous intensity values for the modules shall be as defined in VTCSH Part 2, Section 4.1 at seventy-seven degrees Fahrenheit (77° F).

The modules shall meet or exceed eighty-five percent (85%) of the standard light output values found in the ITE publication: Equipment and Material Standards, VTCSH Part 2, throughout the useful life based on normal use in a traffic signal operation over the operating temperature range.

The measured chromaticity coordinates of the modules shall conform to the chromaticity requirements of VTCSH Part 2, Section 4.2, throughout the useful life over the operating temperature range.

F. Physical and Mechanical Requirements:

LED traffic signal modules shall be designed as retrofit replacements for existing optical units of signal indications and shall not require special tools for installation. Type 1 modules shall be installed.

G. Environmental Requirements:

The LED signal module shall be rated for use in the operating temperature range of minus forty degrees Fahrenheit (-40°F) to one hundred sixty-five degrees Fahrenheit (165° F). The modules shall meet all specifications throughout this range.

The LED signal module shall be protected against dust and moisture intrusion per the requirements of NEMA Standard 250-1991 for Type 4 enclosures to protect all internal components.

H. Construction:

The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply for the module shall be integral to the unit.

The circuit board and power supply shall be contained inside the module. Circuit boards shall conform to Chapter 1, Section 6 of the "Transportation Electrical Equipment Specifications". The assembly and manufacturing process for the LED signal assembly shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

I. Materials:

Material used for the lens and signal module construction shall conform to ASTM Specifications for the materials.

Enclosures containing either the power supply or electronic components of the signal module shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

J. Module Identification:

Each module shall have:

1. Manufacturer's name,
2. Trademark,
3. Model number,
4. Serial number,
5. Date of manufacture (month-year), and

6. Lot number as identification permanently marked on the back of the module.

The following operating characteristics shall be permanently marked on the back of the module: rated voltage and rated power in Watts and Volt-Ampere.

If a specific mounting orientation is required, each module shall have prominent and permanent marking(s) for correct indexing and orientation within a signal housing. The markings shall consist of an up arrow, or the word "UP" or "TOP".

K. Type 1 Traffic Signal Module:

The following specification requirements apply to the Type 1 module only. All general specifications apply unless specifically superseded in this section.

Type 1 modules can be manufactured under this specification for the following faces:

1. Twelve inch (12") green circular

2. Twelve inch (12") green arrow

L. Physical and Mechanical Requirements:

The module shall fit into existing traffic signal section housings built to the specifications detailed in ITE Publication: Equipment and Material Standards, "Vehicle Traffic Control Signal Heads", with the reflector and lamp socket remaining in place, and without modification to the housing.

Each Type 1 module shall be designed to be installed in the door frame of a standard traffic signal housing. The Type 1 module shall be sealed in the door frame with a one-piece EPDM (ethylene propylene rubber) gasket.

The maximum weight of a Type 1 module shall be one and eight tenths kilograms (1.8kg, or four pounds).

M. Construction:

Each Type 1 module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a green lens and gasket, etc.), and shall be weather proof after installation and connection.

N. Conductors:

Two (2) secured, color coded, nine hundred fourteen millimeter (914 mm, or thirty-six inch) long, 600 V, twenty gauge (#20) minimum, jacketed wires, conforming to the National Electric Code, rated for service greater than two hundred twenty degrees Fahrenheit (220° F), are to be provided for electrical connection for each Type 1 LED signal module. Conductors for Type 1 modules shall be one meter (1m) in length, with quick disconnect terminals attached and shall conform to Section 86-4.01B, "Electrical Components" of the State Standard Specifications.

If specified in the purchased order, the module will be equipped with an adapter that will screw into the medium base, lamp socket. The adapter shall be able to accept the quick disconnect terminals at the end of the conductors for the module. The electrical contacts of the adapter shall be made of brass.

O. Lens:

The lens of the Type 1 module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.

The lens may be tinted or may use transparent film or materials with similar characteristics to enhance ON/OFF contrasts.

The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.

The LED signal module lens shall be UV stabilized and shall be capable of withstanding ultraviolet (direct sunlight) exposure for a minimum period of forty-eight (48) months without exhibiting evidence of deterioration. If a polymeric lens is used, a surface coating or chemical surface treatment shall be used to provide front surface abrasion resistance.

P. 12" Arrow:

The following specification requirements apply to the twelve inch (12") arrow module only. All general specifications apply unless specifically superseded in this Section.

1. The arrow module shall meet specifications stated in the VTCSH Section 9.00 for arrow lenses.

2. The LEDs shall be spread evenly across the illuminated portion of the arrow area.

3. Each module shall provide an average luminous intensity of at least five thousand five hundred candelas per square meter (5,500 cd/m2) throughout the useful life over the operating temperature range. Arrow modules shall be tested as per California Test 3001.

Q. Quality Assurance:

The modules shall be manufactured in accordance with a manufacturer quality assurance (QA) program. The QA program shall include two (2) types of Quality Assurance:

1. Design quality assurance

2. Production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of the modules built to meet this specification, and a documented process of how problems are to be resolved.

QA process and test results documentation shall be kept on file for a minimum period of seven (7) years.

LED signal module designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

R. Production Quality Control Testing:

The following Production Quality Assurance tests shall be performed on each new module prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. Test results shall be retained by the manufacturer for seven (7) years.

1. Burn-in period shall consist of each signal module being energized at rated voltage for a thirty (30) minute stabilization period before the measurement is made.

2. Each module shall be tested for rated initial intensity after burn-in.

3. A single point measurement, with a correlation to the intensity requirements of Section 1.04 of the VTCSH for circular modules, may be used.

4. The ambient temperature for this measurement shall be greater than seventy-seven degrees Fahrenheit (77° F). Each module not meeting minimum luminous intensity requirements per Table 1 of VTCSH for circular modules, eleven thousand candela per square meter (11,000 cd/m2) for arrow modules, or three thousand seven hundred fifty candela per square meter (3,750 cd/m2) for pedestrian modules shall be cause for rejection.

5. Each module shall be tested for required power factor after burn-in.

6. Each module shall be measured for current flow in amperes after burn-in. The measured current values shall be compared against rated values resulting from design qualification measurements. The current flow shall not exceed the rated value.

7. Each module shall be visually inspected for any exterior physical damage or assembly anomalies. Careful attention shall be paid to the surface of the lens to ensure there are no scratches (abrasions), cracks, chips, discoloration, or other defects. Any such defect shall be cause for rejection.

S. Warranty:

The manufacturer shall provide a written warranty against defects in materials and workmanship for the modules for a period of sixty (60) months after acceptance of the modules. Replacement modules shall be provided promptly after receipt of modules that have failed at no cost to the City. All warranty documentation shall be given to the City prior to random sample testing.

45-18 Pedestrian Signals

A. Countdown pedestrian signals shall be used and shall be the "incandescent looking" light emitting diode (LED) type, similar to the Leotek CIL Series, or approved equal. The countdown pedestrian signals shall conform to the applicable provisions of Section 86-4.03 "Pedestrian Signal Faces" of the State Standard Specifications.

B. The installation shall not require any special tools or the drilling of any holes in the reflector or housing.

C. The luminous intensity, quantity and color of the LEDs shall be such that the intent of the current ITE specification for Pedestrian Traffic Control Signal Indications is satisfied.

D. The unit shall have a maximum power consumption of fifteen watts (15w) at 120 VAC. The unit shall operate between 92 VAC and 125 VAC and from seventy-seven degrees Fahrenheit (77º F) to one hundred fifty-eight degrees Fahrenheit (158º F).

E. Each assembly shall consist of a minimum of two hundred twenty-five (225) LEDs arranged in minimum of 3 strings. The loss of a single LED shall result in a loss of only that string.

F. LED pedestrian signal face "Upraised Hand & Walking Person" module shall be designed to mount in the standard existing Type A housing. Pedestrian signal face modules shall be designed to mount behind or replace the existing face plate of existing Type A housing as specified by the

requirements of the ITE Standards "Pedestrian Traffic Control Signal Indications" and the MUTCD. The design of the modules shall require a specific mounting orientation.

45-19 Detectors

A. Vehicle detectors shall be a combination of Type D and Type E detectors as indicated in the approved Construction Drawings, and shall conform to the applicable provisions of Section 86-5 "Detectors" of the State Standard Specifications. Loops shall be cut into pavement and installed on the same day. This shall include placement of loops and asphaltic concrete sealant.

B. Loop wire shall be Type 1.

C. Loop detector lead-in cable shall be Type C.

D. The sides of the slot shall be vertical, and the minimum radius of the slot entering and leaving the circular part of the loop shall be one and one-half inches (1½"). Slots in asphalt concrete pavement shall be filled with asphaltic concrete sealant as follows:

1. After conductors are installed in the slots cut in the pavement, sealant shall be applied in accordance with the provisions of the State Standard Specifications.

2. Temperature of sealant material during installation shall be above seventy degrees Fahrenheit (70° F). Air temperature during installation shall be above fifty degrees Fahrenheit (50° F). Sealant placed in the slots shall be compacted by use of an eight inch (8") diameter by one-eighth of one inch (⅛") thick steel hand roller or other tool approved by the Engineer. Compacted sealant shall be flush with the pavement surface. Minimum conductor coverage shall be one inch (1"). Excess sealant remaining after rolling shall not be reused. On completion of rolling, traffic will be permitted to travel over the sealant.

E. Conductors for each inductive loop detector shall be continuous and unspliced from the pull box adjacent to the loop to the field terminals in the cabinet.

45-20 Pedestrian Push Buttons

Pedestrian push-button assemblies shall comply with the Architectural and Transportation Barriers Compliance Board Interim Final Ruling on the Americans with Disabilities Act Accessibility Guidelines and the following requirements:

A. The housing for the unit shall be made of 356 Aluminum heat treated to meet Specification T-6. It shall be of a telescoping, vandal-proof design. The color shall be black matching color #17038, #27038, or #37038 of Federal Standard #595B.

B. The plunger/actuator surface shall have a diameter of two inches (2") or greater. It shall be made of polished stainless steel and assembled with all stainless steel components so as not to be corrosive. The actuator shall be conical in shape with the cone extending four hundred four thousandths of one inch (.404") above the bezel of the switch housing in the neutral position.

C. The microswitch component shall be a dust-proof, water-resistant type. It shall be a single-pole, precision, snap-acting type. It shall also be UL listed and CSA Certified and meet the requirements for NEMA TS-1 and TS-2.

D. The complete switching unit shall have an operating force of three pounds (3 lbs.) and a minimum release force of three pounds (3 lbs.). Pre-travel shall be sixty-two thousandths of one inch (0.062") minimum. Over-travel shall be sixty-two thousandths of one inch (0.062") minimum.

E. Units shall permit recessed mounting in existing standard type pedestrian push-button assemblies without modification.

45-21 Safety and Street Lighting

A. Luminaires used for safety shall be GE #M2AC (200 Watt) S7HGMC31 or equal. A twist-Lock photo-electrical control unit and receptacle shall be installed on each luminaire.

B. All luminaires to be mounted on horizontal mast arms, when tested in accordance with California Test 611, shall be capable of withstanding cyclic loading in:

1. A vertical plane at a minimum peak acceleration level of 3.0 g's peak-to-peak sinusoidal loading (same as 1.5 g's peak) with the internal ballast removed for a minimum of two million cycles without failure of any luminaire parts, and

2. A horizontal plane perpendicular to the direction of the mast arm at a minimum peak acceleration level of 1.5 g's peak-to-peak sinusoidal loading (same as 0.75 g's peak) with the internal ballast installed for a minimum of two million cycles without failure of any luminaire parts.

C. No part of the slipfitter mounting brackets on the luminaires shall develop a permanent set in excess of two hundredths of one inch (0.02") when the four (4) three-eighths of one inch (⅜") diameter cap screws used for mounting are tightened to a torque of ten foot pounds (10 ft. lbs.).

D. Ballasts shall be the lag regulator type.

E. Each light shall have a fuse protection located in the pull box next to the lighting standard.

45-22 Removing, Reinstalling, or Salvaging Electrical Equipment

Salvaged traffic signal equipment and electrical materials shall be hauled to City of Visalia Corporation Yard and stockpiled, unless noted otherwise in the approved Construction Drawings.

45-23 Traffic Signal Street Name Signs

The Contractor shall furnish and install Traffic Signal Street Name Signs and sign mounting brackets as shown in the approved Plans or per the City of Visalia Engineering Improvement Standards and described below. The signs and sign mounting brackets shall be manufactured in accordance with the specifications, drawings, and lists detailing information.

A. Reflective Materials:

Sheeting material, letters, and border materials shall be Diamond Grade LDP (long distance performance) manufactured by 3M Co. NO SUBSTITUTES will be permitted.

All letters and border material shall be white in color similar to 3M Co. #4090. Background color shall be green similar to 3M ElectroCut Film #1177C. All signs shall have an applied 3M #1160 or equal graffiti film. Only die-cut material shall be used for the letters and border material. No silk-screening of signs will be allowed.

Spacing of all letters shall be in accordance with sheeting manufacturer's recommended standard so as to achieve optimum legibility and uniformity under both day and night conditions.

B. Blade Structure:

All aluminum sign blanks shall be 6061-T6 Alloy or 5052H38, eight-hundredths of one inch (0.080") in thickness.

Dimensions of sign blanks shall be forty-eight inches (48") minimum to eighty-four inches (84") maximum wide by eighteen inches (18") high. No splices of sign blanks shall be permitted.

Each sign shall have a one and one-fourth inches by one and one-fourth inches by one-eighth of one inch (1¼"x1¼"x⅛") aluminum angle as stiffeners. One near the top and one near the bottom of the sign. Space between the stiffeners shall be fifteen and three-fourths inches (15¾") outside to outside and centered on the sign. Stiffeners shall be fastened to the sign, with legs of aluminum angle pointing toward the center of the sign, using three-sixteenths of one inch (3/16") rivets placed on six inch (6") centers. No rivet shall be placed closer than one inch (1") nor more than two inches (2") from the edge of the sign. All stiffeners shall be equal in length to the sign. Stiffeners shall be installed after face material has been applied to the aluminum sign blank.

Each stiffener shall have two (2) three-eighths of one inch (⅜") diameter holes spaced four and seven-eighths inches (4⅞") apart. The holes shall be centered on a point one-third (⅓) of the way from the right-hand edge of the sign when facing the legend. Holes shall match those in the sign mounting bracket.

C. Sign Mounting Bracket:

Material used to manufacture sign bracket shall be twelve gallons (12gal), hot-rolled sheet steel, low carbon, commercial quality, specification QQS-663, grade 1010. Bracket shall be hot-dip galvanized after fabrication per specification ASTM-A-123_68.

Tolerances shall be plus or minus one thirty-seconds of one inch (1/32"), for angles plus or minus zero degrees to thirty minutes (±0d30'00").

Four (4) five-sixteenths of one inch (5/16") – thirteen inches by one and one-half inches (13"x1½") bolts with proper nuts and one (1) lock washer per bolt shall be provided as part of the sign mounting bracket.

D. Quality of Work:

All signs fabricated shall conform to the manufacturer of sheeting, letters, and borders application methods. All signs shall be free of wrinkles, cracking, crazing, or blistering upon delivery to the City.

Satisfactory performance of reflective quality of fabricated signs shall be as follows:

1. Minimum Initial Retroreflectivity Brightness

2. Candelas per foot candle per square foot

3. (0.2 degree obs. and -4 degree entrance)

Color	M.I.R.B.
White	800
Green	80

The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that:

1. The sign is ineffective for its intended purpose when viewed from a moving motor vehicle under normal day and night driving conditions; or

2. The coefficient of retroreflection is less than the minimum specified.

All signs shall be date stamped, at the time of fabrication as per manufacturer's requirements to verify guarantee period. Any sign not so marked shall be replaced at the manufacturer's expense.

Traffic signal street name signs shall be strapped to the signal poles at a height of sixteen feet (16') to the bottom of the sign by the use of three-fourths of one inch (¾") wide, three-tenths of one inch (0.030") thick, AISI Type 201 stainless steel strapping. Strapping shall be placed at the three (3) locations provided by the slots in the mounting bracket. Buckles used shall be designed for three-tenths of one inch (0.030") stainless steel banding. City will supply street name sign and mounting bracket. Contractor is to provide strapping and strapping hardware.

45-24 Traffic Signal Battery Back-Up System

A. General:

This specification establishes the minimum requirements for a complete emergency battery backup system for use with Light Emitting Diode (LED) Traffic Signal Modules. The battery backup system shall be a Dimensions system or approved equal. The battery backup system (BBS) shall include, but not be limited to the following:

1. Inverter/charger,
2. Power transfer relay,
3. Batteries,
4. A separate manually operated non-electronic bypass switch and
5. All necessary hardware and interconnect wiring.

The BBS shall provide reliable emergency power to a traffic signal system (Vehicle and Pedestrian Traffic) in the event of a power failure or interruption.

The BBS shall be capable of providing power for full run-time operation for an "LED-only" intersection (all colors: red, yellow, green and pedestrian heads) or flashing mode operation for an intersection using Red LED's.

The BBS shall be designed for outdoor applications, in accordance with the Caltrans Transportation Electrical Equipment Specifications (TEES), Chapter 1, and Section 8 Requirements.

B. Operation:

The BBS shall provide a minimum two (2) hours of full run-time operation for an "LED-only" intersection (minimum 700W/1000VA active output capacity, with eighty percent (80%) minimum inverter efficiency).

The maximum transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, shall be sixty-five milliseconds (65ms). The same maximum allowable transfer time shall also apply when switching from inverter line voltage to utility line voltage.

The BBS shall provide the user with three (3) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) dry relay contact closures, available on a panel-mounted terminal block, rated at a minimum 120V/1A, and labeled so as to identify each contact. For typical configuration, see Figure 3 at the end of this Section 45.

1. The first set of NO and NC contact closures shall be energized whenever the unit switches to battery power. Contact shall be labeled or marked "On Batt."

2. The second set of NO and NC contact closures shall be energized whenever the battery approaches approximately forty percent (40%) of remaining useful capacity. Contact shall be labeled or marked "Low Batt."

3. The third set of NO and NC contact closures shall be energized two hours after the unit switches to battery power. Contact shall be labeled or marked "Timer"

Operating temperature for the inverter/charger, power transfer relay and manual bypass switch shall be minus thirty-five degrees Fahrenheit (-35° F) to one hundred sixty-six degrees Fahrenheit (166° F).

Both the Power Transfer Relay and Manual Bypass Switch shall be rated at 240VAC/30 amps, minimum.

The BBS shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 - 4.0 mV/°C per cell.

The temperature sensor shall be external to the inverter/charger unit. The temperature sensor shall come with two meters (2m, or six feet six inches) of wire.

Batteries shall not be recharged when battery temperature exceeds one hundred twenty-two degrees Fahrenheit, plus or minus thirty-eight degrees (122° F ± 38°).

BBS shall bypass the utility line power whenever the utility line voltage is outside of the following voltage range: 100VAC to 130VAC (± 2VAC).

When utilizing battery power, the BBS output voltage shall be between 110 VAC and 125 VAC, pure sine wave output, three percent (3%) THD, 60Hz ± 3Hz.

BBS shall be compatible with Caltrans Model 332 Cabinets, Model 170 Controllers, Model 2070 Controllers and cabinet components for full time operation.

When the utility line power has been restored at above 105 VAC ± 2 VAC for more than thirty (30) seconds, the BBS shall transfer from battery backed inverter mode back to utility line mode. BBS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.

In the event of inverter/charger failure, battery failure or complete battery discharge, the power transfer relay shall revert to the NC (and de-energized) state, where utility line power is connected to the cabinet.

Recharge time for the battery, from "protective low-cutoff" to eighty percent (80%) or more of full battery charge capacity, shall not exceed twenty (20) hours.

C. Mounting / Configuration

1. General:
   Inverter/Charger Unit shall be rack or shelf-mounted.

   Power Transfer Relay and Manual Bypass Switch shall be mounted on the 332 Cabinet standard Electronic Industries Association (EIA) rail.

   All interconnect wiring provided between Power Transfer Relay, Bypass Switch and Cabinet Terminal Service Block shall be no less than two meters (2m, or six feet six inches) of ten gauge (#10) wire.

   Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be two meters (2m, or six feet six inches) of eighteen gauge (#18) wire.

   See Figure 4 that provides clarification as to how BBS Power Transfer Relay and Manual Bypass Switch are interconnected with Model 332A Cabinets in order to ensure interchangeability between all BBS manufacturers.

   All necessary hardware for mounting (shelf angles, rack, etc.) shall be included in the bid price of the BBS. A minimum of six (6) bolts/fasteners shall be used to secure swing-trays to the 332 Cabinet Standard EIA four hundred eighty two and six-tenths millimeters (482.6mm, or 19") rack. All bolts/fasteners and washers shall meet the following requirements:

   a. Screw type: Pan Head Phillips machine screw,
   b. Size and Thread pitch: 10-32,
   c. Material: 18-8 stainless steel (Type 316 stainless steel is acceptable as an alternate),
   d. Washer: Use one (1) flat washer (18-8 stainless steel) under the head of each 10-32 screw (provided that the screws are properly tightened, lock washers are unnecessary),
   e. Number of screws per swivel bracket, minimum: six (6) screws per swivel bracket. Spaced evenly along bracket, with one (1) screw near each end.

2. Internal mounted battery option: Not allowed.

3. External battery cabinet option:

   a. Inverter/Charger, Power Transfer Relay and manually operated Bypass Switch shall fit inside a typical fully equipped Caltrans Model 332 Cabinet that includes one (1) Model 170.

   b. Batteries shall be housed in a NEMA 3R rated cabinet mounted to the side of the Model 332 Cabinet. This external battery cabinet shall conform to TEES, March 29, 2002 Chapter 7, Section 2-Housings for the construction and finish of the cabinet.

   c. Batteries shall be mounted on individual shelves.

   d. Four (4) shelves shall be provided. There shall be a minimum of three hundred four and eight-tenths millimeters (304.8mm, or 12") clearance between shelves. Each shelf shall be a minimum of two hundred twenty-eight and six tenths millimeters by six hundred

thirty five millimeters (228.6mm x 635.0mm, or 9" x 25"), and capable of supporting a minimum of fifty-seven kilograms (57kg, or 125 lbs.)

e. The external battery cabinet shall mount to the Model 332 Cabinet with a minimum of eight (8) bolts. (See Figure 5 at the end of this Section 45.)

f. The external battery cabinet shall be ventilated through the use of louvered vents, filter, and one thermostatically controlled fan as per TEES Chapter 7 Section 2-Housings.

g. External battery cabinet fan shall be AC operated from the same line output of the Manual Bypass Switch that supplies power to the 332 Cabinet.

h. The external battery cabinet shall have a door opening to the entire cabinet. The door shall be attached to the cabinet through the use of a continuous stainless steel piano hinge or four (4), two-bolts per leaf, hinges as per TEES Chapter 7, Section 2. The door shall use a padlock clasp or latch and lock mechanisms as described in the TEES, in order to lock the door.

i. The BBS with external battery cabinet shall come with all bolts, conduits and bushings, gaskets, shelves, and hardware needed for mounting.

4. Maintenance, displays, controls, and diagnostics:

a. The BBS shall include a display and /or meter to indicate current battery charge status and conditions.

b. The BBS shall have lightning surge protection compliant with IEEE/ANSI C.62.41.

c. The BBS shall be equipped with an integral system to prevent battery from destructive discharge and overcharge.

d. The BBS and batteries shall be easily replaced with all needed hardware and shall not require any special tools for installation.

e. The BBS shall include a front-panel event counter display to indicate the number of times the BBS was activated and a front-panel hour meter to display the total number of hours the unit has operated on battery power. Both meters shall have push button resets.

f. Manufacturer shall include a set of equipment lists, Operation and Maintenance (O&M) Manuals, and board-level schematic and wiring diagrams of the BBS, and the battery data sheets. Manual shall conform to TEES March 29, 2002, Chapter 1, Section 1.2.4.2.

5. Battery system:

a. Individual batteries shall be 12V type, 65 amp-hour maximum, and shall be easily replaced and commercially available off the shelf.

b. Batteries used for BBS shall consist of four to eight (4-8) batteries with a cumulative minimum rated capacity of 240 amp-hours.

c. Batteries shall be deep cycle, sealed prismatic lead-calcium based AGM/VRLA (Absorbed Glass Mat/ Valve Regulated Lead Acid).

d. Batteries shall be certified by the manufacturer to operate over a temperature range of minus thirteen degrees Fahrenheit (–13° F) to one hundred sixty-six degrees Fahrenheit (166° F).

e. The batteries shall be provided with appropriate interconnect wiring and corrosion-resistant mounting trays and/or brackets appropriate for the cabinet into which they will be installed.

f. Batteries shall indicate maximum recharge data and recharging cycles.

g. Battery interconnect wiring shall be via modular harness. Batteries shall be shipped with positive and negative terminals pre-wired with red and black cabling that terminates into a typical power-pole style connector. Harness shall be equipped with mating power-pole style connectors for batteries and a single, insulated plug-in style connection to inverter/charger unit. Harness shall allow batteries to be quickly and easily connected in any order and shall be keyed and wired to ensure proper polarity and circuit configuration.

h. Battery terminals shall be covered and insulated so as to prevent accidental shorting.

6. Quality assurance:

a. Each BBS shall be manufactured in accordance with a manufacturer Quality Assurance (QA) Program. The QA program shall include two (2) Quality Assurance procedures:

i. Design QA (see 7 "Design qualifications testing" below) and

ii. Production QA. The Production QA shall include statistically controlled routine tests to ensure minimum performance levels of BBS units built to meet this specification and a documented process of how problems are to be resolved.

b. QA process and test results documentation shall be kept on file for a minimum period of seven (7) years.

c. Battery Backup System designs not satisfying Design QA Testing and Production QA Testing requirements shall not be labeled, advertised, or sold as conforming to this specification.

7. Design qualifications testing:

a. The manufacturer, or an independent testing lab hired by the manufacturer, shall perform Design Qualification Testing on new BBS system(s) offered, and when any major design change has been implemented on an existing design. A major design change is defined as any modification, either material, electrical, physical or theoretical, that changes any performance characteristics of the system, or results in a different circuit configuration. Where a dispute arises in determining if a system is a new design or if the system has had a major design change, the State will make the final determination if Design Qualification Testing is required prior to production consideration.

b. A quantity of two (2) units for each design shall be submitted for Design Qualification Testing.

c. Test units shall be submitted to Caltrans TransLab, Electrical Testing Branch after the manufacturer's testing is complete.

d. Manufacturer's testing data shall be submitted with test units for Caltrans verification Design Qualification Testing.

8. Burn in:

a. The sample systems shall be energized for a minimum of five (5) hours, with full load of 700 watts, at temperatures of minus thirty-five degrees Fahrenheit (–35° F) and one hundred sixty-six degrees Fahrenheit (166° F), excluding batteries, before performing any design qualification testing.

b. Any failure of the BBS, which renders the unit non-compliant with the specification after burn in, shall be cause for rejection.

c. For Design Qualification Testing, all specifications will be measured including, but not limited to:

i. Run time while in battery backup mode, at full load.

ii. Proper operation of all relay contact closures ("On-Batt", "Low-Batt" and "Timer").

iii. Inverter output voltage, frequency, harmonic distortion, and efficiency, when in battery backed inverter mode.

iv. All power transfer voltage levels. See BBS Specifications 1.8, 1.11 and 1.12.

v. Power transfer time, from loss of utility line voltage to stabilized inverter line voltage, from batteries.

vi. Back feed voltage to utility when in battery backed inverter mode.

vii. IEEE/ANSI C.62.41 compliance.

viii. Battery charging time.

ix. Event counter and runtime meter accuracy.

9. Production quality control testing:

a. Production Quality Control tests shall consist of all of the above listed tests and shall be performed on each new system prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. The manufacturer shall retain test results for seven (7) years.

b. Each BBS shall be given a minimum one hundred (100) hour burn in period to eliminate any premature failures.

c. Each system shall be visually inspected for any exterior physical damage or assembly anomalies.

d. Any defects shall be cause for rejection.

Note: Key all locks to match standard City keys. Controller cabinet lock shall match standard City controller cabinet key. Police panel lock shall match standard City police panel key. Battery backup cabinet lock shall match controller cabinet key.

45-25 Traffic Signal Interconnect Conduit

Installation of all equipment, materials, pull rope, and components for traffic signal interconnect system, pursuant to the provisions of the State Standard Specifications, State Standard Plans, these Specifications, Plans and Special Provisions.

All conduits shall be Type 3 rigid nonmetallic PVC conduit per section 86-2.05A of the State Standard Specifications. All conduit shall have a #12 tracer wire installed.

All conduit runs into pull boxes shall have 45° sweeps.

Installation of Type 6E pull boxes shall include the cost of furnishing and installing each new Type 6E pull boxes within the interconnect system as specified by the Plans and the Special Provisions and all work associated with installation of said pull boxes.

Grout shall be placed in bottom of standard pull boxes. Cover markings shall be per Caltrans Standard Plan ES-8 except that the word “Caltrans” shall be omitted. Pull boxes not protected by curb shall be traffic bearing.

Protection and restoration of existing improvements shall comply with Section 5-9, “Preservation of Property” and State Standard Specification 5-1.36, “Property and Facility Preservation.”

The Contractor shall be responsible for the protection of public and private property adjacent to the work and shall exercise due caution to avoid damage to such property.

The Contractor shall contact USA to request marking of all utilities in the project area. The contractor shall determine the exact location and depth of all potentially conflicting utilities or other improvements, prior to doing any work that could potentially interfere with or damage such facilities. This applies to any utility marked via USA, utilities shown any sheet of the plans, or whose presence can be inferred from conditions visible or evident at the job site, including markings, meters, trenches, manholes, handholes, pedestals, structures, valves, or buildings. Where possible, the location of the conduit and pull boxes shall be adjusted in the field to avoid conflicts with any utilities.

The Contractor is required to submit to the Engineer "Drawings of Record" prints, prior to the City's accepting the installations. The prints shall indicate in red all deviations from the contract plans such as location of poles, pull boxes and runs, depths of conduit, number of conductors and other appurtenant work for future references.

45-26 Median Lighting

Description - Install all equipment, materials, and components for traffic signals and highway safety lighting system, pursuant to the provisions of the State Specifications Section 86, “Electrical Systems,” State Standard Plans, these Specifications, Plans and these Special Provisions.

Foundations - Portland cement concrete shall conform to Section 50, "Minor Concrete," and shall be Class 2.

Safety and Street Lighting - Luminaries used for safety and street lighting shall be GE M2AC10S7H2GMC31 or equal. A twist-lock photo-electrical control unit and receptacle shall be installed on each luminaire. Luminaries are to be provided by the Contractor, and installed by the Contractor.

All Luminaries to be mounted on horizontal mast arm(s), when tested in accordance with California Test 611, shall be capable of withstanding cyclic loading in:

1. A vertical plan at a minimum peak acceleration level of 3.0 g's peak-to-peak sinusoidal loading (same as 1.5 g's peak) with the internal ballast removed for a minimum of 2 million cycles without failure of any luminaire parts, and

2. A horizontal plan perpendicular to the direction of the mast arm at a minimum peak acceleration level of 1.5 g's peak-to-peak sinusoidal loading (same as 0.75 g's peak) with the internal ballast installed for a minimum of 2 million cycles without failure of any luminaire parts.

No part of the slip fitter mounting brackets on the luminaries shall develop a permanent set in excess of 0.020-inch when the four 3/8 inch-diameter cap screws used for mounting are tightened to a torque of 10 foot pounds.

Ballast's shall be the lag regulator type.

Lamps used in safety lighting luminaries shall be as specified on the traffic signal plans.

Lamps used in street lighting shall conform to Section 86-6 of the Standard Specifications and be 100 watts, 240-volt, high-pressure sodium, and operate at 9,500 lumens unless stated otherwise on the plans.

Each light shall have a fuse protection located in the pull box next to the lighting standard.

Standards used for street lighting shall be pre-stressed concrete octagonal pole equal to the Ameron 1C1 Series. Pole length shall be 25' 9". Pole finishes shall be blasted black and white aggregates with no protective coating. Concrete lighting poles shall be ordered as double arm as shown on the plans.

The cost to provide and install the Electric Service Pedestal shall be included in the various items for double or single arm street lights.

Luminaire arm(s) shall be 8'-0" long. Material shall be of Carson-Steel sheets and strip structural quality, ASTM Designation A750, Grade C. Arm mounted on poles shall be perpendicular to street.

Material:
Pull Boxes: Caltrans No. 5 with a 12” extension or approved equal

Light standards: Pole length 25' 9"
Arm length 8'0" (single or double mast arm)
Pole - Ameron Series 1C1 pre-stressed concrete pole

Conduit & City Pull Boxes – All conduit and pull boxes located in the medians shall be placed in accordance with the Plans and Standard Drawings and the requirements of this section. For medians running in the north-south direction all conduit and pull boxes shall be installed on the east side of the median. For all medians running in the west-east direction all conduit and pull boxes shall be installed on the north side of the median.

45-27 Measurement and Payment

Traffic Signal Installation and Lighting
Payment for Traffic Signal Installation and Lighting shall be at the contract lump sum price. Full compensation for furnishing all labor, equipment, tools, materials, incidentals and for doing all work complete and in place, including providing the electrical service, to provide a fully functioning system in accordance with the State Standard Specifications and Plans, these Specifications and Plans, and all other Contract Documents shall be included in the lump sum price paid for Traffic Signal Installation and Lighting and no additional compensation will be allowed therefore. All temporary and final trench resurfacing for conduit installation and other items shall be included in the payment for Traffic Signal Installation and Lighting.

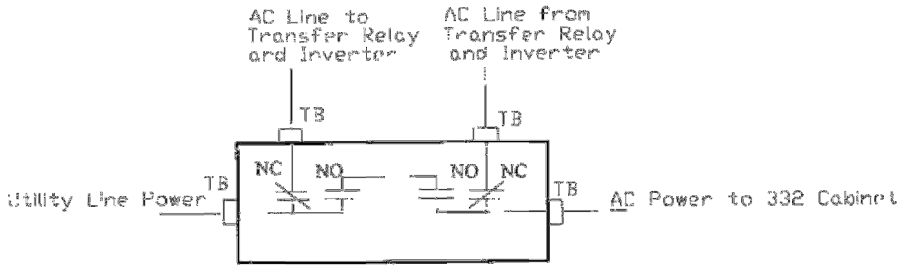
Note: Key all locks to match standard City keys. Controller cabinet lock shall match standard City controller cabinet key. Police panel lock shall match standard City police panel key. Battery backup cabinet lock shall match controller cabinet key.

Traffic Signal Interconnect Conduit
Payment for Traffic Signal Interconnect Conduit shall be at the contract unit price paid per lineal foot of conduit. Measurement shall be from pull box to pull box, along the alignment of the run, as measured in the field. Full compensation for furnishing all labor, equipment, materials, tools, and incidentals including conduits, wiring, pull boxes, sweeps, hardware, trenching, backfilling, paving, temporary and final trench resurfacing, boring, replacement of pavement striping and markers damaged during construction, protection of existing detector loops and leads, in accordance with the Specifications, Plans, and Contract Documents complete and in place shall be included in the unit price paid per lineal foot of conduit for Traffic Signal Interconnect Conduit and no additional compensation will be allowed therefore.

Median Lighting
Payment for Median Lights shall be at the contract unit price paid per each single or double arm street light pole. The contract price paid for each street light shall include full compensation for furnishing all labor, materials, tools, equipment, conduits, wiring, pull boxes, foundations, poles, mast arms, luminaries, trenching, backfilling, paving, temporary and final trench resurfacing, and incidentals and for doing all the work involved for installing each single or double arm street light, complete in-place, including providing the electrical service, as shown on the Plans, as specified in the Specifications, the Contract Documents, and as directed by the Engineer and no additional compensation will be allowed therefore.

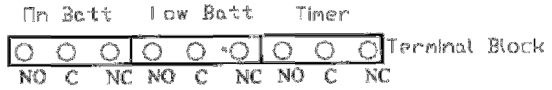
BBS Specification Clarifications

(a) Manual Bypass Switch (shown in non-bypass, or BBS, mode)



Notes:
1. TB - #8 Terminal Blocks
2. NO - Normally Open
3. NC - Normally Closed
4. NO/NC contacts shall all toggle simultaneously with one single manually operated switch.
5. Manual Bypass Switch shall only switch line. Neutral and Equipment Ground are not switched and shall be connected to 332 Cabinet buses.

(b) Relay contacts (NO/NC) available on panel-mounted terminal block (typ)



Notes:
1. NO/NC contacts may either share or use separate commons.

Figure 3

BBS Utility Power Connection Diagram

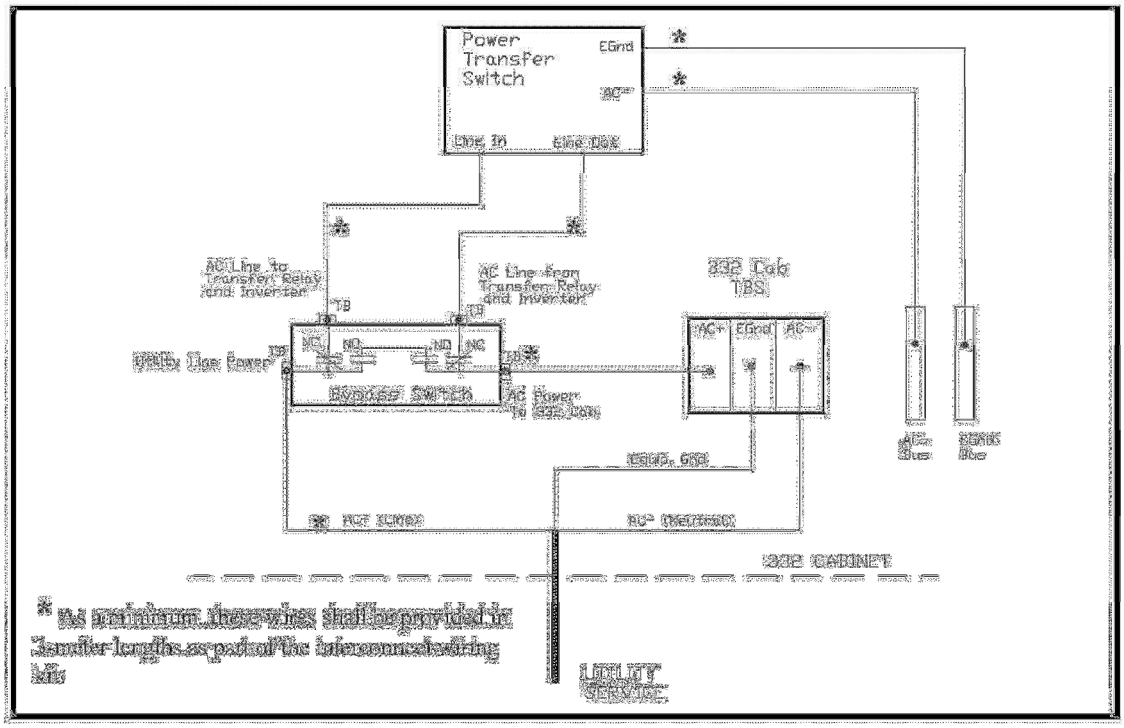


Figure 4

External Battery Cabinet

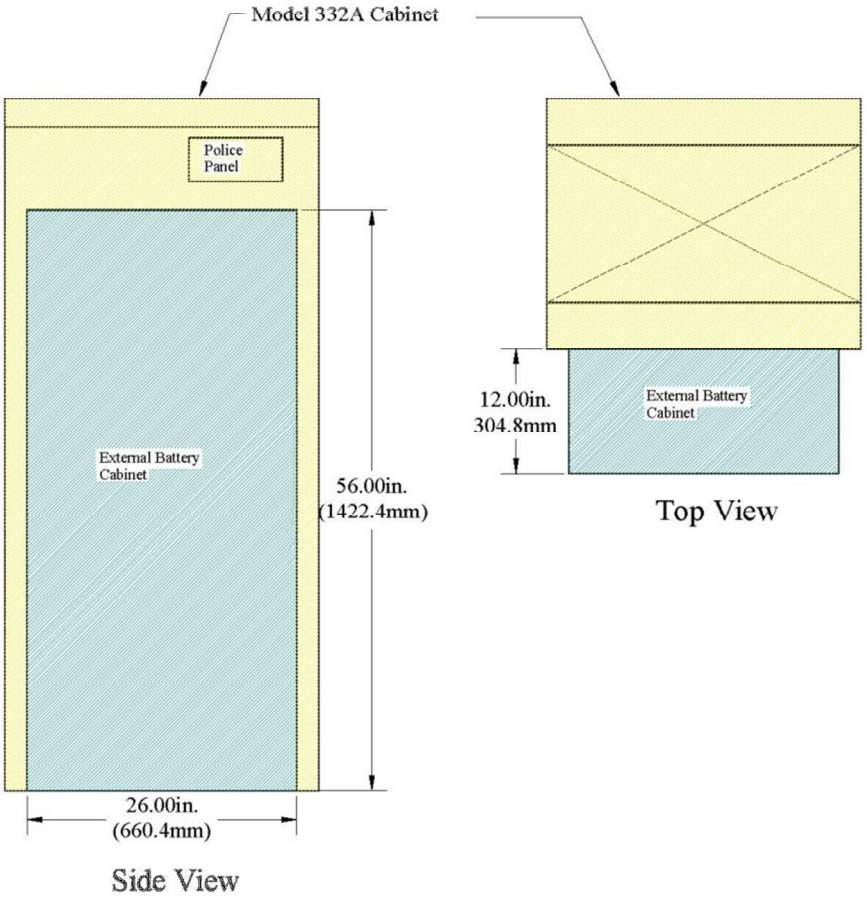


Figure 5

SECTION 46 TRAFFIC STRIPES, SIGNS, AND PAVEMENT MARKINGS

46-1 General

This work shall consist of, but not be limited to, furnishing and installing traffic signs, painted traffic stripes (traffic lines) and pavement markings including glass beads, at the locations and in accordance with the details shown on the Plans, as specified in the Specifications, or as directed by the Engineer. This work shall also include installation, maintenance, and removal of all temporary reflective markers and temporary reflective tape.

For the purposes of these Standard Specifications, traffic stripes (traffic lines) are defined as longitudinal centerlines and lanelines which separate traffic lanes in the same or opposing direction of travel, and longitudinal edgelines which mark the edge of the traveled way or the edge of lanes, or longitudinal lines which mark bicycle lanes. Pavement markings are defined as transverse markings which include, but are not limited to, word and symbol markings, limit lines (stoplines), crosswalk lines, bicycle lane markings, shoulder markings, and parking stall markings.

Permanent striping and marking shall not be placed on any new pavement surfaces until the surface has been in place for a minimum of 20 working days. The Contractor shall install temporary reflectorized markers which shall be left in place until the permanent striping is installed. Temporary reflective road marker tabs, approved for use by the Engineer, shall be installed in accordance with the manufacturer's specifications but shall not be spaced at more than 15-foot intervals. Temporary reflective road marker tabs shall also be placed at all stop bars that are removed and shall have a minimum of six (6) reflectors or as directed by the Engineer. The Contractor shall also install temporary reflective tape to establish obliterated pavement markings including but not limited to crosswalks, stop bars, stop markings, and turn arrows. The temporary reflective markers and temporary reflective tape shall be the same color as the lane line, centerline, or pavement marking the markers/tape replace. The Contractor shall maintain all temporary reflective markers and temporary reflective tape for the entire duration of the project.

The Contractor shall be responsible for cat tracking all traffic stripes and limit lines/crosswalk lines prior to placing permanent striping. Written approval of the temporary cat tracking shall be obtained from the Engineer prior to installing permanent striping and markings. All temporary road marker tabs and reflective tape shall be removed completely just prior to installation of the final striping and pavement marking.

46-2 Materials

46-2.1 Thermoplastic materials

Thermoplastic materials shall not be used unless shown to be required on the Plans or specified for use in the Contract Specifications. Where thermoplastic is required, thermoplastic material shall conform to Section 84-2.02 "Materials," of the State Standard Specifications.

46-2.2 Paints

Paint shall be waterborne unless otherwise shown on the plans or specified in the Contract Specifications. Traffic paint shall be Ennis Paint, EP Series water based, fast dry, Traffic and Parking Lot Paint, or Pervo Paint Company, Traffic water base, PTWB Series (Caltrans) 8000, or approved equal unless noted otherwise. All paint material shall be required to have glass beads applied to provide reflective qualities. All paints waterborne traffic shall be rapid dry, designed for traffic use and shall conform to the latest revisions of the San Joaquin Valley Unified Air Pollution District, Control Architectural Coatings Rule 4601 which requires that traffic paints shall not exceed the limit of 150 grams of volatile organic

compounds (VOC's) per liter of coating as applied, excluding water. Paint shall also comply with any applicable State air pollution regulations.

A. Waterborne Paint

Waterborne paint (rapid dry) shall comply with the following specifications:

Color	White	Yellow	Black
Pigment, % by weight +/- 2%	60	59	58
Vehicle, % by weight	38-42	38-42	38-42
Total Solids, % by weight minimum	76	75	74
Viscosity, K.U. @ 77° F	78-92	78-92	78-92
Fineness of Grind, Hegman minimum	3.5	3.5	3.5
Dry time: 77° F without beads ASMT D-711, minutes maximum	10	10	10
Flexibility, 8 Mils wet, 24 hours are dry ½" Mandrel	No cracking	No cracking	No cracking
Contrast Ratio: 15 Mils wet, min.	.98	.98	.98
Weight per gallon minimum	13.50	13.0	12.50
Reflectance, minimum	85	50	N/A
VOC gms/liter, maximum	150	150	150

B. Solvent Borne Paint

Where shown on the Plans or specified by the Contract Specifications to be applied, solvent borne paint shall comply with the following specifications:

Color	White	Yellow	Black
Pigment, % by weight	57-62	57-62	57-62
Vehicle, % by weight	38-42	38-42	38-42
Total Solids, % by weight minimum	72	72	72
Viscosity, K.U. @ 77° F	70-85	70-85	70-85
Fineness of Grind, Hegman Minimum	4	4	4
Dry time: 77° F without beads ASMT D-711, minutes maximum	3-6	3-6	3-6
Flexibility, 8 Mils wet, 24 hours are dry ½" Mandrel	No cracking	No cracking	No cracking
Contrast Ratio: 15 Mils wet, min.	.98	.98	.98
Reflectance, minimum	85	50	N/A
VOC gms/liter, maximum	150	150	150

46-2.3 Curb and Parking Stall Painting

Curb Painting: curbs shall be painted as shown on the plans. Both the top of the curb and the face of the curb shall be painted. Parking stall "T-markers" and curbs do not require glass beads and reflective qualities.

Curbs shall be clean and dry prior to painting. Contractor shall remove existing curb paint by scraping or grinding prior to application of new paint. Grinding shall not damage the existing concrete improvements.

Curbs shall be painted the color as specified on the plans. Curb paint shall be applied by spraying methods approved by the Engineer.

Curb paint shall be Ennis Paint, EP Series, water based, fast dry, Traffic and Parking Lot Paint, or Pervo Paint Company, Traffic water based, PTWB Series (Caltrans) 8000 Series, or approved equal.

46-2.4 Glass Beads

Glass beads (spheres) shall conform to State Specification No. 8010-004 (Type II) and meet the following requirements.

General: Glass spheres shall lend themselves readily to firm embedment when dropped on freshly placed waterborne and solvent borne traffic paint.

Appearance: A minimum of 85% of the spheres by count shall be true spheres when testing in accordance with applicable ASTM Methods. They also shall be free of air inclusions, milkiness and dark spots. The spheres shall be clean and free of any foreign material.

Coatings: Spheres to be used on Waterborne Paint: The spheres shall be treated with the correct coatings to maximize proper embedment and adhesion in water borne paint.

Spheres to be used on Solvent Borne Paint: The spheres shall be completely uncoated. There shall be no moisture or adhesion coating applied to the spheres.

Gradation: The glass spheres shall conform to the following grading requirements to closely match the AASHTO Designation: M-247.

US Mesh	% By Weight Passing
20	100
30	85 +/- 10%
50	15-35
100	0-5

Physical Properties. Glass spheres shall conform to the following properties:

Refractive Index, minimum 1.50

Moisture Content, maximum 0.01%

46-2.5 Traffic Signs

All traffic signs and the installation thereof shall conform to the current Standards of the California MUTCD and the following:

All traffic signs shall be 0.080 inch thick aluminum.

Stop Signs, Speed Limit Signs, and all School and Pedestrian Signs shall have a 3M #4090 DG3 reflective sheeting with an applied 3M #1160 or equal Graffiti Film. School and Pedestrian Signs shall be Florescent Yellow Green in color.

All other signs shall have 3M 4000 series "Diamond Grade" reflective sheeting with an applied 3M #1160 or equivalent Graffiti Film.

46-2.6 Sign Mounting Hardware

All mounting hardware shall be zinc coated, galvanized, or stainless steel. Aluminum will only be allowed for rivets. Banding shall be ½ inch wide stainless steel. Hose clamps are not permitted.

Signs mounted on street light poles or traffic signal poles shall be mounted with "Band-it Type" 3/4-inch stainless steel strapping material.

46-2.7 Sign Posts

All posts for traffic signs shall be Telespar 2 inch square x 14 gauge galvanized steel, with holes punched on all four sides for the entire length of the post.

All post anchor bases for traffic signs shall be Telespar 2-1/4 inch square x 12 gauge galvanized steel.

46-3 Removal of Existing Markings

Removal of existing striping or pavement markings shall comply with Section 15-2.2C, "Traffic Stripes and Pavement Markings," and the directions of the Engineer.

46-4 Application Equipment

Application equipment for paint shall comply with Section 84-3.02C, "Application Equipment," of the State Standard Specifications and all equipment shall be "No Airspray Equipment".

46-5 Application of Paint and Glass Beads

Preparation of surfaces and application of paint and beads shall conform to the requirements of Sections 84-1 & 84-3 of the State Standard Specifications, and as amended by these Standard Specifications. Tolerances and appearance shall conform to the requirements of Section 84-1.03C, "Tolerances and Appearance," of the State Standard Specifications.

The application rates of waterborne or solvent borne paint provided in Section 84-3 of the State Standard Specifications and as amended by these Standard Specifications. Two coats of paint shall be applied at the rate of 100 square feet per gallon of paint at a thickness of 15 mils wet. Glass beads shall be applied for both coats of paint at a rate of 5 lbs. per gallon of paint.

Word markings, letters, numerals, legends and symbols shall be applied utilizing suitable approved equipment together with approved stencils and templates. All markings shall be standard, and shall be identical with those used by the City of Visalia.

When no previously applied figures, markings, or traffic striping are available to serve as a guide, suitable layouts such as "cat-tracking" shall be spotted in advance of the permanent application. Written approval of temporary layout shall be obtained from the Engineer prior to permanent application. The Contractor shall mark or otherwise delineate the traffic lanes in the new roadway or portion of roadway, or detour, before opening it to traffic.

Alignment and layout of the work by the Contractor shall conform to Sections 84-1 and 84-3 of the State Standard Specifications. The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimensions, and application of the pavement striping and marking.

In areas of high traffic volume, the Contractor shall schedule work to apply traffic lines and markings in off-peak traffic hours, or on weekends. In all cases, the Contractor shall use proper and sufficient directional signs, warning devices, barricades, pedestals, lights, traffic cones, flagpersons, or such other devices to protect the work, workers, and the public.

All markings and striping shall be protected from injury and damage of any kind while the material is drying. All adjacent surfaces shall be protected from disfiguration by spatter, splashes, spillage, and dripping of material. The contractor shall clean any excess materials on the work site as soon practical after the application of the various materials. Damaged stripes or markings shall be cleaned and reapplied by the Contractor at his expense.

46-6 Traffic Sign Installation

Traffic signs shall be installed at the locations, of the type, and at the height shown on the Plans, as specified in the Specifications, as directed by the Engineer, and in conformance with the current California MUTCD.

If a sign is to be installed in existing concrete, the concrete shall be cored with a 8-inch diameter hole.

If a sign is to be placed where new concrete is to be poured, a post anchor base shall be provided in the new concrete. Solid embedment of sign posts in concrete is not permitted.

Sign posts shall be imbedded in the ground to the depth specified in the Plans, Contract Specifications, or California MUTCD as applicable. Any voids around sign posts passed through sleeves in concrete shall be backfilled with soil and thoroughly compacted to the satisfaction of the Engineer.

If the plans call out a new traffic sign post within 20' of an existing sign post, street light pole, or traffic signal pole, the Contractor shall call it to the attention of the Inspector. The Engineer shall determine if the traffic sign can be mounted on the existing post, street light pole, or traffic signal pole. Every effort shall be made to reduce the number of new traffic sign posts within the project limits. Signs mounted on street light poles or traffic signal poles shall be mounted with "Band-it Type" 3/4-inch stainless steel strapping material.

46-7 Measurement

Unless otherwise specified in the Contract Specifications, Striping and Marking Pavement shall be measured on a lump sum basis, and shall include any required removal of existing pavement striping or markings.

Unless otherwise specified in the Contract Specifications, traffic signs will be measured on a per each basis.

46-8 Payment

The lump sum price paid for Striping and Marking Pavement shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as specified in the Specifications, or as directed by the Engineer.

The per each price paid for Signs shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in installing signs as shown on the Plans, as specified in the Specifications, or as directed by the Engineer.

SECTION 47 RAISED PAVEMENT MARKERS

47-1 General

Raised Pavement Markers shall be as specified in Section 85, "Pavement Markers," of the State Standard Specifications, except as modified in this Section 47.

Deletions:

Section 85-1.03D Pavement Recesses is hereby deleted.
Delete from all other sections any reference to pavement recesses.

Additions:

Pavement Marker Protection
In compliance with Sections 7-18, "Public Safety," 15-2.2C, "Traffic Stripes and Pavement Markings," and 15-2.2D, "Pavement Markers," the Contractor shall provide appropriate traffic control measures to protect all newly placed raised pavement markers from damage, up to and including scheduling the installation during off-peak or weekend periods. Any damaged pavement markers shall be immediately replaced at the Contractor's expense. Where existing raised pavement markers are to remain, the Contractor shall take special care to protect existing pavement markers from damage or coating. The Contractor shall, at his expense, replace all damaged or coated markers.

Pavement Marker Removal
Removal of Pavement Markers shall comply with Sections 7-18, "Public Safety," 15-2.2C, "Traffic Stripes and Pavement Markings," and Section 15-2.2D, "Pavement Markers," and the directions of the Engineer.

Measurement and Payment
Measurement and payment for installing Raised Pavement Markers will be made on a lump sum basis and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as specified in the Specifications, or as directed by the Engineer.

SECTION 48 ENGINEERING FABRICS

Engineering fabrics shall be as specified in Section 88, "Engineering Fabrics," of the State Standard Specifications.

SECTION 49 (RESERVED)

SECTION 50 PORTLAND CEMENT CONCRETE

Portland Cement Concrete shall be as specified in Section 90, "Concrete," of the State Standard Specifications, except as modified in this Section 50.

All minor concrete improvements constructed in the City of Visalia including, but not limited to, manhole bases, curbs, gutters, curb and gutter, valley gutters, sidewalks, curb ramps, alley approaches, driveway approaches, mow strips, fence footings, median caps, and other facilities shall be considered "Minor Concrete" in accordance with Section 90-2 of the State Standard Specifications, unless noted otherwise on the Plans or specified in the Contract Specifications.

The following Sections of the State Standard Specifications shall be amended as follows:

90-2.01C Submittals
For all mix designs, submit compressive strength test results that verify the minimum required compressive strength. In addition to the submittals listed in this section, all concrete mix design submittals shall include test history results that show the concrete compressive strength of the concrete mix at 3 days, 7 days and 28 days. Certificates of Compliance will be required for the concrete mix design, aggregates, portland cement, any SCM used in the mix design, and any other item as required by the Engineer.

90-2.02B Cementitious Material
In the City of Visalia the required cementitious content will be determined by Concrete Class as follows:

Class 2 Concrete shall contain not less than 590 pounds of cementitious material per cubic yard with 1-inch maximum aggregate grading. Mix shall have a 5 inch maximum slump with a minimum 28 day compressive strength of 3,000 pounds per square inch.

Class 3 Concrete shall contain not less than 505 pounds of cementitious material per cubic yard with 1-inch maximum aggregate gradation. Mix shall have a 5 inch maximum slump with a minimum 28 day compressive strength of 2,500 pounds per square inch.

Class 4 Concrete shall contain not less than 420 pounds of cementitious material per cubic yard with 1-inch maximum aggregate gradation. Mix shall have a 5 inch maximum slump with a minimum 28 day compressive strength of 2,500 pounds per square inch.

Where no concrete class is specified on the Plans or Standard Drawings or in these Specifications, Class 3 Concrete shall be used.

Where other sections of these Specifications require different concrete mix properties than those shown in this section, the mix properties required in the other Sections shall take precedence.

Unless approved otherwise by the Engineer, a minimum of 85 percent of the cementitious material used in the mix design for each Concrete Class shall be a Type II or V Portland Cement complying with the requirements of ASTM C150 and the State Standard Specifications or a combination thereof. Where approved by the Engineer, up to 15 percent of the cementitious material required in the concrete mix may be Class F Fly Ash meeting the requirements of the State Standard Specifications.

90-2.02C Aggregate
The maximum aggregate size must not be larger than 1 inch. Combined Aggregate Grading for Minor Concrete shall meet the 1-inch maximum grading requirements of Section 90-1.02C(4)(d) "Combined

Aggregate Grading," of the State Standard Specifications. The following Combined aggregate grading table is copied from the State Standard Specifications for reference:

Sieve size	Percentage passing			
	1-1/2 inch max	1 inch max	1/2 inch max	3/8 inch max
2 inch	100	--	--	--
1-1/2 inch	90–100	100	--	--
1 inch	50–86	90–100	--	--
3/4 inch	45–75	55–100	100	--
1/2 inch	--	--	90–100	100
3/8 inch	38–55	45–75	55–86	50–100
No. 4	30–45	35–60	45–63	45–63
No. 8	23–38	27–45	35–49	35–49
No. 16	17–33	20–35	25–37	25–37
No. 30	10–22	12–25	15–25	15–25
No. 50	4–10	5–15	5–15	5–15
No. 100	1–6	1–8	1–8	1–8
No. 200	0–3	0–4	0–4	0–4

Do not change from one aggregate grading to another during the progress of the work.

Section 90-1.01C(2) will apply and the portions of Section 90-1.02C that define aggregate quality will apply to minor concrete.

90-2.04 Payment

No payment will be made for Portland Cement Concrete. Payment will be considered included in the various bid items of work to which the work relates.

SECTION 51 PAINT

Paint shall be as specified in Section 91, "Paint," of the State Standard Specifications.

SECTION 52 ASPHALTS

Asphalts shall be as specified in Section 92, "Asphalts," of the State Standard Specifications.

SECTION 53 LIQUID ASPHALTS

Liquid Asphalts shall be as specified in Section 93, "Liquid Asphalts," of the State Standard Specifications. Section 93-1.04 "Payment" of the State Standard Specifications shall have the following sentence added: Liquid Asphalt will be paid for under other bid items requiring liquid asphalt unless noted otherwise in the Special Provisions.

SECTION 54 ASPHALTIC EMULSIONS

Asphaltic Emulsions shall be as specified in Section 94, "Asphaltic Emulsions," of the State Standard Specifications. Section 94-1.04 "Payment" of the State Standard Specifications shall have the following sentence added: Asphaltic Emulsions will be paid for under other bid items requiring liquid asphalt unless noted otherwise in the Special Provisions.

SECTION 55 EPOXY

Epoxy shall be as specified in Section 95, "Epoxy," of the State Standard Specifications.

CITY OF VISALIA

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

STANDARD SPECIFICATIONS

March 2008

Copies of this book may be purchased for $20.00 each
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ENGINEERING DIVISION
315 EAST ACEQUIA AVENUE
VISALIA, CA 93291

CITY OF VISALIA

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

STANDARD SPECIFICATIONS

The City of Visalia Engineering Division has recently revised and updated this set of Standard Specifications. These Standard Specifications have been used as accepted standards for subdivisions, and other building, public works and parks projects. These Standard Specifications and Engineering Improvement Standards will be considered for updates as practices and materials change; and these updates will occur on an as needed basis and approved by the City Engineer, but at a minimum every two (2) years; and these updates will be automatically incorporated as part of the whole Standard Specifications.



Approved by: _____ R.C.E. 50022
Public Works Director

March 2008

CITY OF VISALIA
ENGINEERING DIVISION
315 EAST ACEQUIA AVENUE
VISALIA, CA 93291

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SECTION 1 - DEFINITIONS AND TERMS

1.01 GENERAL

Wherever in these Standard Specifications or the State of California Standard Specifications and other contract documents the abbreviations and terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as provided in Section 1 of the State of California Department of Transportation Standard Specifications, latest edition, or as modified in these Standard Specifications.

1.02 DEFINITIONS AND TERMS

The definitions and terms as used in these Standard Specifications and the State of California Standard Specifications shall be interpreted and understood as established in Section 1 of the State of California Standard Specifications except as modified herein:

a. Addenda: Written interpretations or revisions to any of the contract documents issued by the City before the bid opening.

b. Bid: The proposal submitted by the Contractor in response to the invitation to bid made by the City.

c. Bidder: Any individual, firm, partnership, corporation, or combination thereof, submitting a proposal for the work contemplated, acting directly through a duly authorized representative.

d. Certified Testing Laboratory: An established laboratory properly certified and approved by the Director of Public Works to test materials, specimen, or work involved in the contract, and as specified herein.

e. Change Order: An order approved by the Engineer and issued to the Contractor amending the contract documents.

f. City: The City of Visalia, California, as represented by the City Engineer.

g. City Clerk: The legally authorized City Clerk of the City of Visalia, California.

h. City Council: The City Council of the City of Visalia, California.

i. City Specifications: City of Visalia, California, Department of Public Works Standard Specifications, as amended from time to time.

j. City Standard Drawings: City of Visalia, Department of Public Works Improvement Standards, as amended from time to time.

k. Contract Documents: The Contract Documents include without limitation, the Construction Agreement, Plan, Specifications, Contract Bonds, Addenda to the Construction Agreement, and Change Orders.

l. Contractor: The person or persons, firm, partnership, corporation or combination thereof, private or municipal, who have entered into a contract with the City or a

developer, as party or parties of the second part or his or their legal representative.

m. Department or Department of Transportation: The Department of Public Works, City of Visalia, California.

n. Developer: An individual or group proposing to subdivide or improve land within the City and constructing or causing to be constructed improvements to be accepted by the City.

o. Engineer: The Engineer of the City of Visalia, California, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

p. Finished Grade: The top of the surface layer of asphalt and/or concrete upon which vehicles travel and/or park.

q. Laboratory: See "Certified Testing Laboratory".

r. Plans: The official plans, profiles, typical cross-sections, general cross-sections, elevations and details which show the locations, character, dimensions and details of the work to be performed.

s. Special Provisions: Specific Clauses setting forth conditions or requirements peculiar to the work and supplementary to the City Specifications.

t. Specifications: A set of documents issued for the intended work which includes the City Specifications, the Special Provisions, Notice to Contractors, Proposal, and Contract Form.

u. Standard Plans: The Engineering Improvement Standards of the Public Works Department of the City of Visalia, California.

v. Standard Specifications: The Standard Specifications of the City of Visalia, as prepared by the Engineering Division of the City of Visalia, California.

w. State of California Standard Specifications: The latest revision of the Standard Specifications issued by the Department of Transportation (Caltrans) of the Business, Transportation and Housing Agency of the State of California. Sections 10 through 60, inclusive, Section 73 and Sections 92 through 94, inclusive, of said standard specifications are hereby incorporated and included in the Standard Specifications of the City of Visalia, California, except as modified by said City of Visalia Standard Specifications. Other sections of the State of California Standard Specifications are included in the Standard Specifications of the City of Visalia, California, by reference either in these Standard Specifications, the Special Provisions; or in the Standard Specifications of the State of California.

x. State: California.

y. State Standard Plans: State of California, Department of Transportation Standard Plans, being the current issue in use by the State.

z. Subgrade: The level of embankment, native material and/or import upon which the first layer of street structural section (either aggregate, subbase, aggregate base lime treated or cement treated base [plant mixed], or asphalt concrete is placed).

aa. Working Days: Unless otherwise designated, working day as used in these Standard Specifications shall mean any day on which the Contractor is not prevented by inclement weather, or conditions resulting there, from proceeding with substantial prosecution of the work, excluding Saturdays, Sundays, legal holidays, and any other day the Contractor is specifically required by the Special Provisions to suspend construction operations.

SECTION 2 - PROPOSAL REQUIREMENTS

2.01 GENERAL INFORMATION

The City Engineer of the City of Visalia, California, will receive at his/her office at City Hall East, in said City, until the hour and day specified in the "Notice to Contractor," sealed proposals, for furnishing material, supplies, equipment and labor for performing the work as specified in the approved Construction Drawings, these Standard Specifications and the Special Provisions.

2.02 ENGINEER'S ESTIMATE

The items of work given in the Bid Proposal and in these Standard Specifications are given as a basis for comparison of bids and the City does not expressly or by implication agree that the actual amount of work will correspond therewith, and reserves the right to increase or decrease the amount of the work or to omit portions of the work as may be deemed advisable by the Engineer. All bids are to be compared on the basis of the City Engineer's estimate of the quantities of work to be done.

2.03 UNIT PRICES

Except the items for which lump sums are called for, the unit prices inserted in the bid form by the bidder will be considered to be the bid prices for the various work performed. In case of a discrepancy between the unit price bid and the calculated total, the unit price will govern, and the total will be recalculated. In the event of discrepancy between numbers and written prices, the written prices will govern.

2.04 EXAMINATION OF SITE OF WORK, PLANS, SPECIFICATIONS AND CONTRACT FORM

The Bidder is required to examine carefully the site of the proposed work, the proposal, approved Construction Drawings, specifications and contract forms for the work contemplated, and it will be assumed that the Bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality and quantities of the work to be performed and materials to be furnished, and as to the requirements of the specifications, and the contract. The submission of a proposal shall be considered prima facie evidence that the Bidder has made such examination. A representative from the City Engineer's office will be available to accompany prospective bidders for an inspection of the work herein contemplated.

2.05 FORM OF PROPOSAL

All proposals must be made upon blank forms to be obtained from the City Engineer. All proposals must give the unit price where indicated, or lump sum where unit prices are not called for, for each of the items, and must be signed by the bidder with his address. If the proposal is made by an individual, his name and post office address must be shown. If made by a partnership, the name and post office address of each member of the firm or partnership must be shown. If made by a corporation, the proposal must show the name of the State under

the laws of which the corporation was chartered and the names, titles and business addresses of the president, secretary and treasurer.

All proposals must be submitted under sealed cover and the envelope properly marked "Bid (*Insert Project Title*) ."

2.06 WITHDRAWAL OF PROPOSALS

Any bid may be withdrawn at any time prior to the time fixed in the "Notice to Contractors" for the opening of bids only upon written request for the withdrawal of the bid filed with the City. The request shall be executed by the Bidder or his duly authorized representative. The withdrawal of a bid does not prejudice the right of the Bidder to file a new bid. A bid will not be received after the time, nor any bid withdrawn after the time fixed in the public notice for the opening of bids until either all bids are rejected, or until the expiration of sixty (60) days set from the date set for the opening of bids, or until the contract has been executed and the required Contractor's bonds furnished by the successful Bidder or Bidders, whichever occurs first.

2.07 PROPOSAL GUARANTEE

All proposals must be accompanied by either a cashier's check, certified check or bidder's bond of a corporate surety authorized to do business in the State of California and acceptable to the City in a sum equal to at least ten percent (10%) of the total amount of the bid. Checks or bonds must be made payable to the City of Visalia, such securities to be retained by the City as a guarantee that the Bidder, if his bid is accepted, will enter into a satisfactory contract within ten (10) calendar days, not including Sundays and legal holidays, from the date that the "Notice of Award" is mailed to the Bidder, and will furnish a good and sufficient bond for the faithful performance thereof and for the payment of labor and material costs in accordance with the requirements of the approved Construction Drawings, these Standard Specifications and the Special Provisions.

2.08 REJECTION OF PROPOSALS

The City reserves the right to reject any or all proposals.

Proposals may be rejected if they show any alteration of form, additions not called for, conditional or alternative bids, incomplete bids, erasures, or irregularities of any kind. Proposals in which the prices are obviously unbalanced may be rejected.

2.09 DISQUALIFICATION OF BIDDERS

Unless alternate bids are called for, more than one (1) proposal for the same unit or units from an individual, firm, partnership, co-partnership, corporation, or combination thereof under the same or different names will not be considered. If there is reason for believing that collusion exists among the Bidders, none of the participants in such collusion will be considered in future proposals.

2.10 SUBCONTRACTING

Should any Bidder propose subcontracting any part of the work covered by these Standard Specifications, he shall submit with his bid a description of the work to be done by each subcontractor and the name and the location of the place of business of each such subcontractor as a part of the "Bidder's Proposal". The Contractor shall conform to the requirements of Section 8, "Prosecution and Progress" of the State of California Standard Specifications. The Contractor shall perform with his own organization contract work amounting to not less than fifty percent (50%) of the original total contract price. Attention is directed to Section 8.01 of these Standard Specifications.

2.11 GUARANTEE OF WORK

Before any contract is awarded, the Bidder may be required to furnish a complete statement or the origin, composition, and manufacturer of any or all materials to be used in the construction of the work, together with samples, which samples may be subject to the tests provided for in these Standard Specifications to determine their quality and fitness for the work.

The Bidder may also be required to furnish a written guarantee covering certain items of work for varying periods of time from the date of acceptance of the contract. When such guarantee is required, the form and the time limit of the guarantee will be specified in these Standard Specifications or in the Special Provisions. Said guarantee shall be signed and delivered to the Engineer before acceptance of the contract. The Labor and Materials bond shall not be reduced until the expiration of the time required by Section 3249 of the Civil Code.

2.12 CONTRACTOR'S LICENSE

Unless stated otherwise in the "Notice to Contractors," all prospective Bidders must possess, or be able to obtain within thirty (30) days after the bid date, a Class "A" Contractor's License issued by the State of California. All Contractors and/or subcontractors shall be required to obtain a City of Visalia business license. No payment will be made to any Contractor until such license is obtained.

SECTION 3 - AWARD AND EXECUTION OF CONTRACT

3.01 MULTIPLE CONSTRUCTION UNITS

If there are two (2) or more units in the construction project and the "Notice to Contractors" has called for separate proposals for each unit, the City reserves the right to award the contract for one (1) unit or for more than one (1) unit to one (1) Bidder, while awarding a contract or contracts to other Bidders for other units or combinations of units.

3.02 AWARD OF CONTRACT

The award of the contract, if it is awarded, will be to the lowest responsible Bidder whose proposal complies with all the requirements described. Such award, if made, will be made within thirty (30) days after the opening of the proposals. If the lowest responsible Bidder refuses or fails to execute the contract, the City may award the contract to the second lowest responsible bidder. Such award, if made, will be made within forty-five (45) days after the opening of the proposals. If the second lowest responsible Bidder refuses or fails to execute the contract, the Owner may award the contract to the third lowest responsible Bidder. Such award, if made, will be made within sixty (60) days after the opening of the proposals. The periods of time specified above, within which the award of contract may be made, shall be subject to extension for such further periods as may be agreed upon in writing between the Owner and Bidder concerned.

All bids will be compared on the basis of the Engineer's estimate of quantities of work to be done.

3.03 EXECUTION OF CONTRACT

The contract shall be signed by the successful Bidder and returned together with the contract bonds within ten (10) calendar days, not including Sundays and legal holidays, from the date that the "Notice of Award" has been mailed. No proposal shall be considered binding upon the City until execution of the contract.

Failure to execute a contract and file acceptable bonds as provided herein within ten (10) calendar days, after the Bidder has received notice that the contract has been awarded, shall be just cause for the annulment of the award and the forfeiture of the proposal guarantee as liquidated damages.

3.04 RETURN OF GUARANTEES

All proposal guarantees will be held until ten (10) days after the contract has been awarded, after which the guarantees accompanying proposals no longer considered in making the award will be returned to the Bidder whose proposal they accompanies. Retained proposal guarantees will be held until the contract has been executed, after which all guarantees, except those forfeited, will be returned.

3.05 REQUIRED CONTRACT SECURITIES

The Bidder to whom the contract has been awarded will be required to furnish a labor and material bond in an amount equal to fifty percent (50%) of the contract price, and a faithful performance bond in an amount equal to one hundred percent (100%) of the contract price; said bonds shall be secured from a surety company satisfactory to the City.

Note: Projects funded by State and/or Federal Agencies may require labor and material bond to be equal to one hundred percent (100%) of the contract price.

3.06 CONTRACT DOCUMENTATION SAMPLES

The following contract documents are included in these Standard Specifications as samples only and shall not be considered as originals.

a. Public Contract Code Section 10162 Questionnaire (1 page)

b. Public Contract Code Section 10232 Statement (1 page)

c. Contract Proposal (2 pages)

d. Bidder's Bond (2 pages)

PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE

In accordance with Public Contract Code Section 10162, the Bidder hereby completes, under penalty of perjury, the following questionnaire:

Has the Bidder, or any office of the Bidder, or any employee who has a proprietary interest in the Bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes_____ No_____

If the answer is yes, explain the circumstances in the following space:

SAMPLE

PUBLIC CONTRACT CODE SECTION 10232 STATEMENT

In accordance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one (1) final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two (2) year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Questionnaire and Statement are a part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature, under penalty of perjury, of this Questionnaire and Statement.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

To the City of Visalia, State of California

NON COLLUSION AFFIDAVIT
(Title 23 United States Code Section 112 and Public Contract Code Section 7106)

In accordance with Title 23 United States Code Section 112 and Public Contract Code 7106 the Bidder declares that bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; the Bidder has not directly or indirectly induced or solicited any other Bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any Bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

_____ _____

Signature Date

Note: The above Non-collusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Non-collusion Affidavit.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

SAMPLE

CONTRACT PROPOSAL

Accompanying this proposal is $_____ cash, cashier's check, certified check, or bidder's bond in the amount equal to at least ten percent (10%) of the total bid.

The name of all persons interested in the foregoing proposal as principals are as follows:

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual copartners composing firm; if Bidder or other interested person is an individual, state first and last name in full.

_____

_____

_____

Licensed in accordance with an act providing for the registration of Contractors, License No._____, Class of License(s) _____,

License Expiration Date _____.

The representations made herein are made under penalty of perjury. Any bid not containing this information, or a bid containing information which is subsequently proven false, shall be considered non-responsive and shall be rejected by the City of Visalia.

Signature of Authorized Person(s)

_____

_____

NOTE: If Bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if Bidder is a co-partnership, the true name of the partner or partners authorized to sign contracts on behalf of the co-partnership; and if Bidder is an individual, his signature shall be placed above. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the City Clerk prior to opening bids or submitted with the bid; otherwise, the bid will be disregarded as irregular and unauthorized.

BusinessAddress_____

Place of Residence _____Dated: _____

SAMPLE

SUBCONTRACTORS

In accordance with the provisions of Section 8.01 of the Standard Specifications, each Bidder shall list below the name and location of place of business of each subcontractor who will perform a portion of the contract work in an amount in excess of one-half of one percent (0.50%) of the total contract price. In each instance, the nature and extent of the work to be sublet shall be described.

The General Contractor to whom the contract is awarded will not be permitted, without the written consent of the Engineer, to substitute any person as subcontractor in place of the subcontractor designated in the original bid, or to permit any subcontract to be assigned or transferred, or to allow it to be performed by anyone other than the original subcontractor. The Engineer may consent to the substitution of another person as subcontractor, if the original subcontractor, after having reasonable opportunity to do so, shall fail or refuse to execute, when said written contract is based upon the conditions of the general contract and complies with the subcontractor's written bid.

The failure of the Contractor to specify a subcontractor for any portion of the contract work in excess of one-half of one percent (0.50%) of the total contract price shall be deemed to indicate that the Contractor intends to perform such portion himself. The subletting or subcontracting of work for which is in excess of one-half of one percent (0.50%) of the total contract price, will be allowed only with the written consent of the Engineer.

Name of Subcontractor, License Number Class of License(s)	Street Address of Office, Mill or Shop	Description of work to be performed (also show Bid Schedule Item No.)

SAMPLE

BIDDER'S BOND

TO ACCOMPANY CONTRACT PROPOSAL

Known all men by these presents:

That we, _____ as principal, and _____ as surety, are held and firmly bound unto the City of Visalia in the sum of ten percent (10%) of the total amount of the bid of the principal, to be paid to the said City or its certain attorney, its successors and assigns, for which payment well and truly to be made, we bind ourselves, our heirs, executors, and administrators, successors, or assigns, jointly and severally, firmly by these presented.

In no case shall the liability of the surety hereunder exceed the sum of $_____.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the above mentioned bid to the City of Visalia for certain construction specifically described as follows, for which bids are to be opened at _____ on _____ for _____–(Project Number _____).

NOW THEREFORE, if the aforesaid principal is awarded the contract, and within the time and manner required under the specifications, after the prescribed form in accordance with the bid, and files the two (2) bonds with the City of Visalia, one to guarantee faithful performance and the other to guarantee payment of labor and materials, as required by law, then this obligation shall be null and void, otherwise it shall be and remain in full force and virtue.

SAMPLE

BIDDER'S BOND

In the event suit is brought upon this bond by the obligee and judgment is recovered, the surety shall pay all costs incurred by the obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this _____ day of _____A.DL, 20_____.

_____(Seal)

_____(Seal)

_____(Seal)

_____(Seal)

_____(Seal)

_____(Seal)

Surety

_____

Address

_____

City and Zip Code

NOTE: Signatures of those executing for the surety must be properly acknowledged.

SAMPLE

SECTION 4 - GENERAL SCOPE OF WORK AND RESPONSIBILITIES

4.01 WORK TO BE DONE

The work to be performed under this contract consists of furnishing all materials, equipment, supplies, labor and transportation, and performing all work as required by the contract in strict accordance with the specifications, schedules and drawings, all of which are made a part hereof. The work shall be complete, and all work, material and services not expressly called for in the specifications or not shown on the drawings which may be necessary for completion and proper construction to carry out the contract in good faith and leave the site of the work in a neat condition shall be performed, furnished and installed by the Contractor at no increase in cost to the City.

4.02 ALTERATIONS

By mutual consent in writing of the parties signatory to the contract, alterations or deviations, increases or decreases, additions or omissions, in the approved Construction Drawings, these Standard Specifications and the Special Provisions, may be made and the same shall in no way affect or make void the contract.

The City reserves the right to increase or decrease the quantity of any item or portion of the work, or to omit portions of the work as may be deemed necessary or expedient by the Engineer.

4.03 EXTRA WORK

New and unforeseen work will be classed as extra work when such work cannot be covered by any of the various items or combination of items for which there is a bid price.

No extra work shall be done by the Contractor except upon written order from the Engineer.

Extra work, when ordered and accepted, shall be paid for under written work order in accordance with the terms therein provided. Payment for extra work will be made at the unit price or lump sum previously agreed upon by the Contractor and the Engineer, and approved by the City.

4.04 PUBLIC SAFETY AND CONVENIENCE

The Contractor shall so conduct his operations as to cause the least possible obstruction and inconvenience to public traffic. Unless other existing streets are stipulated in the Special Provisions to be used as detours, all traffic shall be permitted to pass through the work. Residents along the road or street shall be provided passage as far as practicable. Pedestrian access to all properties along the line of work shall be provided and maintained in good condition. Not more than one crossing or intersecting street or road shall be closed at any one time without the approval of the Engineer.

The Contractor shall provide such flagmen, and furnish, erect, and maintain such fences, barriers, lights, and signs as are necessary to give adequate warning to the public at all times

that the road, street, or underground utility is under construction and of any dangerous conditions to be encountered as a result thereof, and he shall also erect and maintain such warning and directional signs as may be furnished by the City.

4.05 PUBLIC NOTICE

The Contractor shall inform in writing all residences along the construction length of the start date for the project at least one (1) week prior to start of work. The Contractor shall inform in writing residences of work that will effect ingress and egress from their property at least two (2) days prior but no more than six (6) days prior to the effect taking place.

The Contractor shall be responsible for media notification five (5) days prior to installing an approved traffic control plan when deemed by the City Engineer. Notification shall include a vicinity map with alternate routes available and be approved by the City Engineer. Traffic control shall coordinate with the order of work and schedule of operations in accordance with Section 5.10 in these Standard Specifications.

Any written notification must be approved by the Project Engineer prior to distribution. All notifications shall include contact information for the City and the Contractor.

Full compensation for conforming to this Section shall be considered to be included in the contract price paid for the various items of work and therefore, no additional compensation shall be allowed.

4.06 DUST CONTROL

The Contractor shall maintain dust control about the site of the work, including any haul roads to or from the site, by whatever means are necessary, such as watering, sweeping or oiling, so as to cause the least possible dust nuisance to the public. Any dust control measure ordered by the Engineer shall be promptly and immediately carried out.

Water for dust control purposes will be furnished as specified in the Special Provisions of these Standard Specifications. The Contractor shall furnish his own equipment for transporting and applying water. Such equipment shall meet the approval of the Engineer. The Contractor shall provide, at all times, an approved backflow prevention device between the public water supply and his equipment for applying or transporting water or when the Engineer determines that a backflow condition could be caused by the method or equipment used to draw water from the public supply.

If the Contractor fails to provide dust control measures so ordered within a reasonable time period as determined by the Engineer, the Contractor or Developer shall pay to the City a penalty of fifteen dollars ($15.00) for each one-half of one (½) hour, or portion thereof, that elapses from the time the penalty is ordered into effect by the Engineer, until dust control measures ordered by the Engineer are completely carried out and the dust nuisance eliminated or prevented.

Such penalty shall be deducted from any monies owed the Contractor or levied as a fine against the Developer. In addition to the penalty as specified above, if conditions warrant, the Engineer may order City forces to eliminate or prevent the dust nuisance. The full cost thereof,

in addition to the penalty as herein provided, shall be deducted from any monies owed the Contractor or shall be levied as a fine against the Developer.

Full compensation for dust control shall be included in the amount bid for the various items of work and no separate payment will be made therefore, unless otherwise specified in the Special Provisions.

4.07 TRAFFIC CONTROL

All traffic and detour patterns shall be as indicated in the Special Provisions or as specified in the permit issued for the work by the City. Any deviations proposed by the Contractor shall have the approval of the Engineer.

The Contractor shall comply with all of the requirements of the State of California Department of Transportation (Caltrans) "Manual of Traffic Controls for Construction and Maintenance Work Zones".

Compliance with the requirements of said manual shall be considered as a minimum requirement and it shall be the responsibility of the Contractor to provide additional safety devices when necessary to maintain a safe condition.

It shall be totally the responsibility of the Contractor to provide and maintain adequate traffic safety devices and warning signs. If the Engineer or the Inspector of the City, notes some deficiency in said devices, the situation shall be corrected immediately by the Contractor.

All traffic signs used within the City of Visalia shall be minimum eight-hundredths of one inch (.080") thickness sign-grade aluminum with 3M™ Diamond Grade™ 3 (Diamond Grade Cubed) Series 4000 Reflective Sheeting or approved equal with 3M™ Series 1160 Anti-Graffiti coating or approved equal. Signs and installation shall conform to Caltrans' latest MUTCD Standards or as directed by the City Engineer.

Full compensation for all costs involved in maintaining traffic control in the vicinity of the work in accordance with the requirements specified shall be included in the lump sum price bid for traffic control. If no bid item is provided for traffic control, the cost therefore shall be included in the various bid items of work.

4.08 COOPERATION

The Contractor shall cooperate in all respects with all public and private agencies, including, but not limited to, the Kaweah Irrigation District, Southern California Gas Company, Comcast, California Water Service, Southern California Edison, AT&T Telephone Company, and the Fire and Police Departments. Should construction be underway by other forces or by other Contractors within or adjacent to the project area, or should work of any other nature be underway by other forces within or adjacent to said project area, the Contractor shall cooperate with all such other Contractors or forces to the end that any delay or hindrance to their work will be avoided.

4.09 PERMITS AND EASEMENTS

The Contractor shall obtain any necessary permits from the County of Tulare, City of Visalia, California Department of Transportation, California Division of Industrial Safety as required by Section 6424 of the California Labor Code, any Railroad or Utility Company, Special District, or Agency affected by the work.

Satisfactory evidence of obtaining the required permits shall be submitted to the Engineer prior to, and as a condition of, issuance of the "Notice to Proceed". The Contractor shall abide by the conditions of said permits and perform all work governed by said permits in conformance therewith and as directed by the Engineer. The Contractor shall procure at no cost to the City all temporary construction easements not shown in the approved Construction Drawings, which he may deem necessary to carry out the work to be done under the contract. Should the Contractor desire to make preliminary soil investigations in public street right of way, he shall secure the required permits from the appropriate department of the City and abide by the provisions of said permits.

4.10 EXISTING IMPROVEMENTS

The Contractor shall preserve all curbs, gutters, sidewalks, and other existing improvements in the vicinity of the work. Any curbs, gutters, sidewalks and other existing improvements damaged by the Contractor's operation shall be replaced at the Contractor's expense.

The Contractor shall be responsible for the protection, restoration or replacement in kind of any improvements such as, but not limited to, lawn, trees, shrubs, hedges, fences, mail boxes, signs, poles, sprinkler systems, walls, sidewalks, driveways, curb and gutter and pavement existing at the start of the work. Replacement and restoration of said improvements shall meet the approval of the Engineer and shall be made immediately upon notification by the Engineer. At locations where work occurs behind curb lines and/or within landscaped areas, all external structure patching, final backfilling, final sprinkler system repairing and lawn reseeding and mulching behind the curb lines shall be completed within fifteen (15) calendar days of beginning of the work.

Irrigation and sprinkler system lines behind the curb disturbed by the construction shall be repaired as follows:

a. Sprinkler or irrigation lines disturbed by structure construction shall be temporarily capped when first disturbed.

b. Sprinkler or irrigation lines and facilities disturbed shall be replaced to original condition using similar material as removed. (Galvanized pipe to be replaced with galvanized pipe, brand name heads replaced with same brand name and model.) Sprinkler lines shall be realigned around structures in order to duplicate original irrigation coverage.

c. Sprinkler systems disturbed and repaired shall be water-tested by the Contractor in the presence of the Engineer before acceptance of the repair.

Existing land subdivision monuments and stakes shall be fully protected from damage or

displacement and they shall not be disturbed unless directed by the Engineer.

All costs involved in the protection, restoration and replacement of existing improvements as specified herein shall be considered as being included in the bid prices of the various items of work, and no separate payment shall be made therefore, unless otherwise specified in the Special Provisions.

4.11 MAINTAINING DRAINAGE

Reference is made to Section 12.05.d of these Standard Specifications. The Contractor shall also provide and maintain drainage to the existing street sections with no separate compensation therefore.

During and following storm conditions, the Contractor shall cooperate with the Engineer in providing for temporary use, for drainage purposes, of completed or partially completed drainage facilities. Temporary provisions for drainage of any area during construction where existing facilities have been damaged or altered by the Contractor during his operations shall be made by the Contractor and as directed by the Engineer.

No separate payment shall be made for maintaining of drainage, and full compensation therefore, shall be included in the prices bid for the various items of work.

The Contractor shall be responsible for all damages to public or private property incurred due to the following: failure to provide adequate drainage within the construction area; blockage of existing drainage facilities upstream from the area of work in excess of the capacity of the existing upstream drainage facilities.

4.12 ELECTRIC AND WATER SERVICES

The Contractor shall provide and pay for electric service for all purposes of power and lighting required for the construction of the work of the contract and shall maintain such service until the completion of the contract.

The Contractor shall contact the California Water Service concerning the use of water for the work done under the contract. All water so used shall be paid for by the Contractor as specified in the Special Provisions.

4.13 RIGHT-OF-WAY

The right of way for the work to be constructed will be provided for, but the Contractor shall make his own arrangements and pay all expenses for additional area required by him outside of the limits of the right of way as shown on the approved Construction Drawings, unless otherwise provided in the Special Provisions. Said additional right of way shall be brought, to the satisfaction of the Engineer, to a condition at least equal to that existing prior to its use by the Contractor.

4.14 CONTRACTOR'S EQUIPMENT

The Contractor shall provide adequate and suitable equipment and means of construction to meet all the requirements of the work. When ordered to do so by the Engineer, the Contractor shall remove unsuitable equipment from the work and discontinue the operation of unsatisfactory equipment. The use of any means of construction which is obsolete as to type, in bad condition, or worn out will not be permitted on the work. The Contractor shall, at his expense, provide off-street storage for equipment not used for that day's work.

4.15 DISPOSAL OF MATERIAL

The Contractor shall make his own arrangements for disposing of materials and he shall pay all costs involved.

All material shall be disposed in accordance with Section 7-1.13 of the State of California Standard Specifications.

When any material is to be disposed of on private property, the Contractor shall first obtain a written permit from the property Owner of whose property the disposal is to be made, and he shall file with the Engineer said permit or a certified copy thereof if such proof is requested by the Engineer.

Unless otherwise provided in the Special Provisions, full compensation for all costs involved in disposing of materials as specified, including all costs of hauling, shall be considered as included in the price paid for the contract item of work involving such materials, and therefore no additional compensation will be allowed.

4.16 PRECONSTRUCTION AND MOBILIZATION/DEMOBILIZATION

Prior to the start of construction, a meeting will be called by the City with the Contractor, Engineer, and all others concerned, including utility companies, to coordinate and schedule the proposed work in order to avoid all possible delays due to conflicts of operation. At this meeting, the Contractor shall submit for City review/approval a construction schedule in bar chart form indicating all critical path operations.

Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, buildings, staging yards, and other facilities necessary for the work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site, including, but not limited to bond premiums and insurance premiums.

Demobilization shall consist of all closing work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals off the Project Site, and for all other work and operations which must be performed to complete the project, including clean-up.

The contract lump sum price paid for Mobilization and Demobilization shall include full

compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in mobilization and demobilization.

SECTION 5 - CONTROL OF WORK

5.01 AUTHORITY OF THE ENGINEER

The Engineer shall decide all questions which may arise as to the quality of acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the work, all questions which may arise as to the interpretation of the approved Construction Drawings, these Standard Specifications and the Special Provisions, all questions as to the acceptable fulfillment of the contract on the part of the Contractor, and all questions as to compensation. His decision shall be final and he shall have authority to enforce and make effective such decisions and orders which the Contractor fails to carry out promptly.

5.02 PLANS

Working drawings or plans for any structure not included in the approved Construction Drawings furnished by the Engineer shall be approved by the Engineer before any work involving these plans shall be performed, unless approval is waived in writing by the Engineer.

It is mutually agreed, however, that the approval by the Engineer of the Contractor's working plan does not relieve the Contractor of any responsibility for accuracy of dimensions and details, and that the Contractor shall be responsible for agreement and conformity of his working plans with the approved Construction Drawings, these Standard Specifications and the Special Provisions.

5.03 CONFORMITY WITH PLANS AND ALLOWABLE DEVIATION

Finished surfaces in all cases shall conform with the lines, grades, cross-sections, and dimensions shown in the approved Construction Drawings. Deviations from the approved Construction Drawings, as may be required by the exigencies of construction, will be determined in all cases by the Engineer and authorized in writing by him.

5.04 COORDINATION OF PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS

The approved Construction Drawings, these Standard Specifications, the Special Provisions, and all supplementary documents are essential parts of the contract, and a requirement occurring in one, is as binding as though occurring in all. They are intended to be cooperative, to describe, and to provide for complete work. The approved Construction Drawings, shall govern over specifications; Special Provisions shall govern over both specifications and the approved Construction Drawings,. These Standard Specifications shall govern over the State of California Standard Specifications.

5.05 INTERPRETATION OF PLANS AND SPECIFICATIONS

Should it appear that the work to be done, or any matter relative thereto, is not sufficiently detailed or explained in the approved Construction Drawings, these Standard Specifications and the Special Provisions, the Contractor shall apply to the Engineer for such further

explanations as may be necessary, and shall conform to such explanation or interpretation as part of the contract, so far as may be consistent with the intent of the original specifications. In the event of doubt or question relative to the true meaning of these Standard Specifications, reference shall be made to the City Engineer, whose decision thereon shall be final.

Lists, rules and regulations referred to are recognized printed standards and shall be considered as one and part of these Standard Specifications within the limits specified. Catalog numbers shall be likewise so considered.

In the event of any discrepancy between any drawings and the figures written therein, the figures shall be taken as correct.

5.06 OMISSIONS IN SPECIFICATIONS AND DRAWINGS

Any material or work mentioned in these Standard Specifications and not shown on the drawings or shown on the drawings and not mentioned in these Standard Specifications shall be of the same effect as if shown or mentioned in both.

Omissions from the drawings or these Standard Specifications of the materials or details of work which are manifestly or obviously necessary to carry out the intent of the drawings and specifications, or which are customarily furnished or performed, shall not relieve the Contractor of his responsibility for furnishing such omitted materials or performing such omitted work; but shall be furnished or performed as if fully shown or described in the drawings or specifications.

5.07 SURVEYING

a. Permanent Survey Markers: The Contractor shall not disturb permanent survey monuments or benchmarks without the consent of the Engineer and shall bear the expense of replacing any that may be disturbed without permission. Any such monument disturbed without permission shall be replaced at the expense of the Contractor.

   When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the Contractor shall adjust the monument cover to the new grade, unless otherwise specified.

b. Lot Stakes: The Contractor shall preserve property line and corner survey markers except where their destruction is unavoidable, and the Contractor is proceeding in accordance with accepted practice. Markers that otherwise are lost or disturbed by his operations, shall be replaced at the Contractor's expense by a Registered Civil Engineer or Licensed Land Surveyor.

c. Survey Service: Surveying for construction will be done by the Engineer except for private contracts. The extent that survey stakes will be provided shall be as set forth in the Special Provisions. The Contractor shall be responsible for preserving construction survey stakes and marks for the duration of their usefulness. If any construction survey stakes are lost or disturbed and need to be replaced, such

replacement shall be by the Engineer at the expense of the Contractor.

The Contractor shall notify the Engineer in writing at least two (2) working days before he will require survey services in connection with laying out of any portion of the work. The Contractor shall, upon request from the Engineer, clear the construction area prior to the setting of any stakes at no additional cost to the City.

d. Private Engineer: Surveying by Private Engineers for work under control of the City shall conform to the quality and practice required by the Engineer. The Engineer shall be notified before the stakes are set. Private Engineers are required to furnish cut sheets to the Engineer immediately upon setting of the grades. On work where staking is done by other than the Engineer, the Engineer will check any staking that is in question. The Engineer shall be the authority to reset grades if a discrepancy exists or order the work corrected by the Engineer responsible for the staking work. No other work shall continue until the stakes ordered to be corrected have been reset to their proper alignment or grade or both.

e. Line and Grade: All work upon completion shall conform to the lines, elevations, and grades shown in the approved Construction Drawings,.

Three (3) consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

Grades for underground conduits will be set at the surface of the ground. The Contractor shall transfer them to the bottom of the trench.

5.08 INSPECTION

The Engineer and the Inspector shall at all times have access to the work during construction, and shall be furnished with every reasonable facility for ascertaining full knowledge respecting the progress, workmanship, and character of materials used and employed in the work.

Whenever the Contractor varies the period during which work is carried out each day, he shall give due notice to the Engineer, or Inspector, so that proper inspection may be provided. Any work done in the absence of the Engineer or Inspector will be subject to rejection.

The inspection of the work shall not relieve the Contractor or any of his obligations to fulfill the contract as prescribed. Defective work shall be made good, and unsuitable materials may be rejected, notwithstanding the fact that such defective work and unsuitable materials have been previously overlooked by the Engineer and Inspector and accepted or estimated for payment.

Projects financed in whole or in part with State and/or Federal funds shall be subject to inspection at all times by the designated Engineer of the Agency involved or their agent.

5.09 FINAL INSPECTION

Whenever the work provided and contemplated by the contract shall have been satisfactorily completed and the final cleaning up performed, the Engineer and the Public Works Inspector will make the final inspection.

5.10 ORDER OF WORK; SCHEDULE OF OPERATIONS

The Contractor shall follow the sequence of operations for a successful completion as rapidly as possible. The Contractor shall submit a proposed schedule of operations with the executed contracts or with requested encroachment permits and construction traffic control submittals for work.

The Engineer shall also have the power to direct the order and sequence of work, which in general shall be to coordinate the construction of several parts of the contract to a successful completion as rapidly as possible.

If at any time appliances used or to be used appear to the Engineer as insufficient or improper for securing the quality of work required, or the required progress, he may order the Contractor to increase efficiency or to improve their appliance results and the Contractor shall conform to such order but the failure of the Engineer to demand any increase of such efficiency or any improvement shall not release the Contractor from his obligation to secure the quality of work or the rate of progress specified.

Full compensation for conforming with such requirements will be considered as included in the prices paid for the various contract items of work, and therefore no additional compensation will be allowed.

5.11 EMERGENCY AVAILABILITY

The Contractor shall furnish to the City, prior to the issuance of the "Notice to Proceed," a list of the persons, together with their addresses and home and cellular telephone numbers, who are authorized to act on the behalf of the Contractor in an emergency arising out of conditions at the work site after normal working hours.

5.12 SANITARY REGULATIONS

Necessary housing accommodations shall be provided for the workmen for changing clothes and for protection during inclement weather. Toilet accommodations shall also be maintained for the use of employees on the work site. The accommodations shall be in approved locations property screened from public observation and shall be maintained in a strictly sanitary manner. The Contractor shall obey and enforce all other sanitary regulations and orders, and shall take precautions against infectious diseases, and the spread of same, and shall maintain at all times satisfactory sanitary conditions around all shanties, tool and supply houses, and on all other parts of the work.

5.13 EXISTING STRUCTURES AND UTILITY FACILITIES SHOWN ON THE PLANS

a. Location: Where underground and surface structures of utilities are shown on the approved Construction Drawings, the locations, depth and dimensions of such structures or utilities are believed to be reasonably correct, but are not guaranteed. Such structures or utilities are shown for the information of the Contractor, but information so given is not to be construed as a representation that such structures or utilities will, in all cases, be found or encountered just where shown, or that they represent all the structures or utilities which may be encountered.

   The Contractor shall be responsible for precisely locating and preserving said underground or surface structures and utility lines and shall, prior to placing or constructing the proposed facilities, expose and/or verify the locations of said utilities and structures. If the Contractor discovers utilities or structures not identified on the approved Construction Drawings, he shall immediately notify the Engineer and the utility or structure Owner in writing.

   At least three (3) working days before entering on the work, the Contractor shall request all Utility Owners having a possible interest in the work area to mark or otherwise indicate the location of their substructure. It shall be the Contractor's responsibility to determine the true location and depth of all utilities and service connections. He shall also familiarize himself with the type, material age and condition of any utility which may be affected by the work.

   The cost of verifying the locations of said utility facilities indicated on the approved Construction Drawings, including exposing them prior to construction, shall be considered as being included in the various bid items of work and therefore no separate payment will be made.

b. Relocation: Whenever it is shown on the approved Construction Drawings or the Special Provisions that, sewer or other facilities or structures are to be relocated, such work shall be done by the Contractor in cooperation with other such utilities. In such a case, the Contractor shall cooperate fully in completing the relocation. Unless otherwise specified, the cost for relocation of the utilities shall be included in the various bid items of work, and therefore no additional payment shall be made.

   Should the Contractor desire to have any relocation made of any utility facility, or other improvement, for his convenience in order to facilitate his construction operations, which relocation is in addition to or different from the relocations indicated on the approved Construction Drawings or in the Special Provisions, he shall make whatever arrangements are necessary with the Owners of such utility for such relocation and bear all expenses in connection therewith.

c. Care of Existing Structures and Utilities: The Contractor shall be liable for all damage done to any structure or utility arising through his negligence and carelessness. He shall take care of and maintain all sewers, drains and culverts encountered in the performance of said work, together with the house services. The Contractor shall take care of all pipes for water, sewer, steam or gas and all wire conduits as well as the underground structures crossing said work, whether shown

on the approved Construction Drawings or not.

The Contractor shall repair in accordance with the requirements of the Owner of the utility or structure, all damage done to any structure or utility through his acts or neglect and shall keep them in repair during the life of his contract. He shall, in all cases, leave them in as good condition as they were previous to the commencement of the work.

Care shall be taken not to move, without the consent of the Engineer, any sewers, drains, culverts, water, gas or other pipes, poles or other structures; and in crossing or running parallel with such structures, they shall be securely hung, braced and supported in place until the work is completed.

The full cost of protection, repair, or replacement of utilities shall be included in the various bid items or work and therefore no additional compensation will be paid.

d. Utility Facilities Not Shown on the Plans; Mains and Trunklines: The Contractor will be compensated for the cost of locating, repairing damage not due to his failure to exercise reasonable care, and for removing or relocating main or trunkline utility facilities not indicated in the approved Construction Drawings, theses Standard Specifications and the Special Provisions with reasonable accuracy. Said compensation will be paid for as "extra work," in accordance with Sections 4.03 and 9.04 of these Standard Specifications. Compensation shall include the cost of equipment on the project necessarily idled during such work.

   In lieu of relocating an underground utility not shown in the approved Construction Drawings, as indicated above, the Engineer may direct that the proposed underground facility be shifted in location or elevation. In such a case, the additional work resulting therefrom shall be classed as extra work and the increase in compensation will be paid for as specified above, except for shifts in depth or alignment less than one (1) foot, in which case no additional compensation will be paid.

e. Limitation of Liability: City: Except for the assumption of liability as may be required by statute and such liabilities assumed in accordance with Section 5.13.d of these Standard Specifications, the City assumes no responsibility or liability in respect to the sufficiency or accuracy of the information or investigation of the location of structures or utility facilities made by it, or in respect to the actual or apparent location of all known structures or utility facilities as indicated in the approved Construction Drawings, or in respect to unlooked for developments which may occur as to the location of such structures or utility facilities which may be encountered at places different from that indicated.

5.14 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

All work which is defective in its construction or deficient in any of the requirements of these Standard Specifications shall be remedied, or removed and replaced by the Contractor in an acceptable manner, and no compensation will be allowed for correction.

Upon failure on the part of the Contractor to comply forthwith with any order of the Engineer made under the provisions of this article, the Engineer shall have authority to cause defective work to be remedied, or removed and replaced, and unauthorized work to be removed, and to deduct the costs thereof from any monies due or to become due the Contractor.

5.15 "AS-BUILT" PLANS

The Contractor shall prepare and submit to the City a complete set of "As-Built" Plans documenting all changes and deviations from the approved Construction Drawings. The "As-Built" Plans must be submitted to the City and approved by same prior to the request for final payment.

Payment for the "As-Built" Plans and all related costs shall be considered as included in the total Contract price paid for the various items of work and no additional compensation provided.

SECTION 6 - CONTROL OF MATERIALS

6.01 SUBMISSION OF DATA WHERE "OR CITY APPROVED EQUAL" IS SPECIFIED

Wherever an article or any class of materials is specified by the trade name or by the name of any particular patentee, manufacturer, or dealer, or by reference to the catalog of any such manufacturer or dealer, it shall be taken as intending to mean and specify the article of material described or any other equal thereto in quality, finish, and durability and equally as serviceable for the purpose for which it is, or they are, intended. The intent of the approved Construction Drawings and these Standard Specifications is to specify high grade standard equipment, and it is not the intent of the approved Construction Drawings and Standard Specifications to exclude or omit the products of any responsible manufacturer if such products are equal in every respect to those mentioned herein.

Whenever the material or article to be furnished is described in these Standard Specifications by trade name, brand name, or other reference is made to specific manufacturers or supplies, "or City approved equal," the person to whom the contract is awarded shall have thirty (30) days after the award of the contract to submit to the Engineer data substantiating a request for the substitution of a "City approved equal" item. The Engineer together with the Public Works Department of the City will make a decision as to whether the product proposed to be furnished is of equal quality and performance and equally suited for the City's purposes.

6.02 SAMPLES AND TESTS

At the option of the Engineer, the source of supply of each of the materials shall be approved by the Engineer before delivery is started and before such material is used in the work. Representative preliminary samples of the character and quality prescribed shall be submitted by the Contractor or producer of all materials to be used in the work, for testing or examination as desired by the Engineer.

The cost of testing shall be borne by the City for work performed under contract by the City. The cost for repeat testing shall be borne by the Contractor. All other tests required for work in City streets and not under contract with the City shall be borne by the Contractor or Developer.

All tests shall be made under the direction of the Engineer by a certified testing laboratory, whether the cost therefore is borne by the City, the Contractor or Developer, and all results shall be furnished to the Engineer when said results are available.

The Contractor shall provide adequate notice to the Engineer when he desires the required testing. A City Engineering Representative shall coordinate with the testing agency to be present on site for all testing.

Any test of materials furnished by the Contractor shall be made in accordance with the commonly recognized standards of national organizations, and such special methods and tests as are prescribed in these Standard Specifications.

The Contractor shall furnish such samples of materials as are requested by the Engineer without charge. No material shall be used until it has been approved by the Engineer. Samples will be secured and tested whenever necessary to determine the quality of materials by such

laboratories as authorized by the Engineer.

6.03 CERTIFICATE OF COMPLIANCE

A "Certificate of Compliance" stating that the materials to be used in the work, comply in all respects with the requirements of the approved Construction Drawings, these Standard Specifications and the Special Provisions shall be supplied to the Engineer upon request. The Certificate shall be signed by the manufacturer of the material or the manufacturer of assembled material delivered to the work, and the lot so certified must be clearly identified in the Certificate.

All materials used on the basis of a "Certificate of Compliance" may be tested and sampled at any time. The fact that the material is used on the basis of a "Certificate of Compliance" shall not relieve the Contractor of responsibility for incorporating material in the work which conforms to the requirements of the approved Construction Drawings, these Standard Specifications and the Special Provisions, and any such material not conforming to such requirements will be subject to rejection whether in place or not.

The City reserves the right to refuse to permit the use of material on the basis of a "Certificate of Compliance".

The form of the "Certificate of Compliance" and its disposition shall be as directed by the Engineer.

6.04 DEFECTIVE MATERIAL

All materials not conforming to the requirements of these Standard Specifications shall be considered as defective, and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the site of the work unless otherwise permitted by the Engineer. No rejected material, the defects of which have subsequently been corrected, shall be used until approved by the Engineer.

Upon failure on the part of the Contractor to comply with any order of the Engineer made under the provisions of this article, the Engineer shall have authority to remove and replace defective material and to deduct the cost of removal and replacement from any monies due or to become due the Contractor.

6.05 GUARANTEE OF MATERIALS AND WORKMANSHIP

The Contractor shall guarantee all materials, equipment and workmanship of the installation. Should any material or appliance or any work develop any defect or weakness due, in the opinion of the Engineer, to the use of imperfect materials, equipment or workmanship, or failure to follow the approved Construction Drawings, these Standard Specifications or the Special Provisions, the Contractor shall be notified at once, and he shall immediately, at his own expense, make the necessary repairs or replacements to make the defective item or items suitable and satisfactory. Should the exigencies be such as to necessitate the repairs before the Contractor could be notified, the City shall have the right to make the necessary repairs or

replacements at the expense of the Contractor, preserving as far as possible all available evidence of the cause of the failure.

This guarantee is not intended to include the damage by the actions of individuals other than the Contractor's forces, or by damages due to the activities of other Contractors working in the area, either during the time this work is under construction or after its acceptance. Attention is directed to Sections 7.11 and 7.15 of these Standard Specifications.

6.06 SALVAGE OF MATERIALS

Where indicated on the approved Construction Drawings, materials to be salvaged shall remain the property of the City and shall be delivered and deposited by the Contractor at the location specified by the Engineer. No separate payment will be made for such salvaging and delivering of material, and the cost thereof shall be included in the various bid items of work.

6.07 PRE-JOB TESTS

In accordance with Section 2.04 of these Standard Specifications, the Contractor shall conduct at his expense, prior to bidding any project, any tests he may deem necessary to satisfy himself as to any existing oil or underground conditions that may exist at the work site. Attention is directed to Section 17.05 of these Standard Specifications. Submission of a bid shall be deemed conclusive evidence that the Contractor has conducted such tests.

6.08 FOREIGN MATERIALS

All foreign material shall be in accordance with the State of California Standard Specifications as noted in Section 6-1.08.

SECTION 7 - LEGAL RELATIONS AND RESPONSIBILITIES

7.01 LAWS TO BE OBSERVED

The Contractor shall keep himself fully informed of all existing State and National laws and all municipal ordinances and regulations of the City which in any manner affect those engaged or which in any way affect the conduct of the work, and of all such orders and decrees of bodies of tribunals having any jurisdiction or authority over the same.

7.02 NOISE ORDINANCE

The Contractor's work shall conform to all municipal ordinances pertinent to noise, including but not limited to, the City of Visalia's Municipal Code Chapter 8.

7.03 UNDOCUMENTED LABOR

The Contractor shall forfeit as a penalty to the City, twenty-five dollars ($25.00) for each undocumented knowingly employed in the execution of the contract, by him or by any subcontractor under him, on any of the work herein mentioned, for each calendar day, or portion thereof, during which such undocumented labor is permitted or required to labor in violation of the provisions of the California Labor Code and in particular, Sections 1850 to 1854 thereof, inclusive.

7.04 HOURS OF LABOR

Eight (8) hours constitutes a legal day's work. The Contractor shall forfeit, as a penalty to the City, twenty-five dollars ($25.00) for each worker employed in the execution of the contract by the Contractor or any subcontractor under him for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one (1) calendar week in violation of the provisions of the California Labor Code, and in particular, Sections 1810 and 1815 thereof, inclusive, except that work performed by employees of Contractors in excess of eight (8) hours per day, and forty (40) hours during any one (1) week, shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1½) times the basic rate of pay, as provided in said Section 1815 of the California Labor Code.

7.05 TRAVEL AND SUBSISTENCE

The Contractor, and each subcontractor under him, shall pay travel and subsistence payments to each workman needed to execute the work, as such travel and subsistence payment are defined in the applicable collective bargaining agreements filed in accordance with Section 1773.8 of the California Labor Code.

7.06 PREVAILING WAGE, PAYROLL

Pursuant to Resolution 83-02, adopted by the City of Visalia City Council on January 3, 1983 a prevailing wage rate is not established or required for all projects. When a project requires

prevailing wage rate, the following shall dictate.

a. The Contractor shall forfeit as penalty to the City twenty-five dollars ($25.00) for each calendar day or portion thereof for each worker paid less than the stipulated prevailing rates for any work done under the contract by him or by any subcontractor under him in violation of the provisions of the California Labor Code, and the Contractor shall comply in particular with the provisions of Section 1775 thereof.

b. The City will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate. The possibility of wage increases in one of the elements to be considered by the Contractor in determining his bid will not, under any circumstances, be considered as the basis of a claim against the City.

c. In accordance with the provisions of Section 1770 of the California Labor Code, copies of the prevailing rate of per diem wages as determined by the Director of the Department of Industrial Relations are on file in the office of the City Engineer and will be made available to any interested party on request. The successful Bidder shall post a copy of such determination at each job site.

d. If specified in the Special Provisions, or if requested by the Engineer, certified copies of payrolls shall be submitted within ten (10) calendar days following the close of the normal pay period or periods. If certified copies of the Contractor's payrolls are requested by the Engineer or specified to be furnished in the Special Provisions, payment for furnishing said certified copies of payrolls shall be considered as included in the various contract items of work and no additional payment will be made therefore.

7.07 LABOR DISCRIMINATION

No discrimination shall be made in the employment of persons within Public Works because of race, color, or religion of such persons and every Contractor for Public Works violating this section is subject to the penalties imposed for a violation of Chapter 1 of Part VII, Division 2 of the California Labor Code, in accordance with the provisions of Section 1735 of said Code.

7.08 APPRENTICES

In accordance with the provisions of Section 1777.5 of the California Labor Code, and in accordance with regulations of the California Apprenticeship Council, properly indentured apprentices shall be employed in the prosecution of the work. Information relative to number of apprentices, identification, wages, hours of employment and standards of working conditions shall be obtained from the Director of the Department of Industrial Relations of the State of California.

The Contractor herein is hereby designated as the "Prime Contractor" and as such is responsible for the compliance with Section 1777.5 of the California Labor Code relating to apprentices, craftsmen or tradesmen, and shall hold the City harmless in all respects from any

failure to do so.

7.09 REGISTRATION OF CONTRACTORS

No contract will be awarded to a Contractor who has not been licensed in accordance with the provisions in Chapter 791, Statutes of 1929, as amended.

7.10 PATENTS

The Contractor shall assume all responsibilities and costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work, and shall indemnify and hold harmless the Engineer, City, and their duly authorized representatives from all suits at law or actions or every nature for or on the account of the use of any patented materials, equipment, devices, or processes used on or incorporated in the work.

7.11 PERMITS AND LICENSES

The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notice necessary and incidental to the due and lawful prosecution of the work.

7.12 RESPONSIBILITY FOR DAMAGE

The City, the City Council, the County of Tulare, the State of California, the United States of America or the Engineer shall not be answerable or accountable in any manner for any loss or damage that may happen to the work or any part thereof, or any material or equipment used in performing the work, or for injury or damage to any person or persons, either worker or public, or for damage to adjoining property from any cause whatsoever during the progress of the work or at any time before final acceptance.

The Contractor shall indemnify and hold harmless the City, the City Council, the County of Tulare, the State of California, the United States of America and the Engineer from any suits, claims or actions brought by any person or persons or on account of any injuries or damages sustained or arising in the construction of the work or in consequence thereof. The City Council may retain so much of the money due the Contractor as shall be considered necessary, until disposition has been made of such suit or claims for damages as aforesaid.

The provisions of this section requiring indemnification of the County of Tulare and the United States of America shall apply only if Federal funding administered through the County of Tulare is funding any portion of the work to which these Standard Specifications apply.

7.13 PRESERVATION OF PROPERTY

Due care shall be exercised to avoid injury to existing highway improvements or facilities, utility facilities, adjacent property, and roadside trees and shrubbery that are not to be removed and pole lines, fences, signs, survey markers and monuments, building and structures, conduits, pipe lines under or above ground, sewer and water lines, all highway facilities, and

any other improvements of facilities within or adjacent to the highway shall be protected from injury or damage, and if ordered by the Engineer, the Contractor shall provide and install suitable safeguards, approved by the Engineer, to protect such objects from injury or damage. If such objects are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored to a condition as good as when the Contractor entered upon the work, or as good as required by these Standard Specifications being performed under the contract. The Engineer may make or cause to be made such temporary repairs as are necessary to restore to service any damaged highway facility and utility facilities. The cost of such repairs shall be borne by the Contractor and may be deducted from any monies due or to become due to the Contractor under the contract.

7.14 CONTRACTOR'S LIABILITY

The Contractor shall provide liability insurance in accordance with the provisions of the agreement pertaining to the specific project.

7.15 WORKER'S COMPENSATION INSURANCE

The Contractor shall secure the payment of Worker's Compensation Insurance in compliance with the provision of the California Labor Code and during the performance of the work will continue so to comply with said provisions of said code. Contractor shall supply the City with certificates of insurance evidencing that Worker's Compensation Insurance is in effect and providing that the City will receive ten (10) days notice of cancellation. If the Contractor self-insures Worker's Compensation, Certificate of Consent of Self-Insure shall be provided to the City.

7.16 CONTRACTOR'S RESPONSIBILITY FOR WORK

Except as provided in these Standard Specifications, until the formal acceptance of the work by the City Council, the Contractor shall have the charge and the care thereof and shall bear the risk of injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof, except such injuries or damages occasioned by acts of the Federal Government or the public enemy.

The Contractor shall check with the utility companies for the exact location of all existing underground installations. The lines as shown on the approved Construction Drawings may not conform to the exact location in the field and the Contractor shall protect all existing lines and shall replace or repair any damage at his expense and no additional compensation will be charge against the City.

Attention is directed to Sections 6.05 and 7.11 of these Standard Specifications.

7.17 NO PERSONAL LIABILITY

Neither the City Council, the Engineer, nor any other officer or authorized assistant or agent shall be personally responsible for any liability arising under the contract.

7.18 RESPONSIBILITY OF CITY

The City shall not be held responsible for the care or protection of any material or parts of the work prior to final acceptance except as expressly provided in these Standard Specifications.

7.19 SAFETY PROVISIONS

The Contractor shall conform to the rules and regulations pertaining to safety established by the California Division of Industrial Safety. All regulations included in the California Occupational Safety and Health Act of 1973 shall be complied with.

a. Job Safety and Special Worker Protection from Toxic or Explosive Gases: The Contractor shall comply with the provisions of the Construction Safety Orders, Tunnel Safety Orders and General Safety Orders issued by the State Division of Industrial Safety, as well as all other applicable laws, ordinances and regulations.

   In conformance with said Safety Orders, the Contractor shall protect workers from toxic or explosive gases by providing whatever testing equipment and other special equipment that may be needed to detect the presence of and to remove such toxic or explosive gases found to exist in any underground facilities involved in the work, whether these facilities are newly constructed or existing.

   The above requirements of the State Division of Industrial Safety are minimum requirements. In addition, the Contractor shall provide, for the life of the contract, similar protection for any person, including the Engineer or any of his authorized representatives, subcontractors, or any other person authorized or required to enter such underground facilities for inspection, repairs, or any other reason.

   Full compensation for all costs involved in providing such job safety and special worker protection, except those pertaining to the hazards of caving ground in excavation, shall be included in the amounts bid for the various items of work, and no separate payment will be made therefore.

b. Worker Protection at Excavations: The Contractor shall comply with the provisions of the Construction Safety Orders, Tunnel Safety Orders, and General Safety Orders issued by the State Division of Industrial Safety, as well as all other applicable laws, ordinances and regulations, as they pertain to the protection of workers from the hazard of caving ground.

   In addition, in compliance with the provisions of Section 6705 of the California Labor Code, the Contractor shall obtain the approval and acceptance of the Engineer in advance of the excavation of any trench or trenches, jacking or

receiving pits, or sump pump pits, five feet (5') or more in depth, of the detailed approved Construction Drawings showing the design of shoring, bracing, sloping, or other provisions to be made by the Contractor for worker protection from the hazard of caving ground during the excavation of such trenches or pits, and during any other period that workers may be exposed to such hazard. If such plan varies from the shoring system standards established by the Division of Industrial Safety, the plan shall be prepared by a Registered Civil or Structural Engineer.

The requirements as above set forth by the State Division of Industrial Safety for the provision of work protection from the hazard of caving ground are minimum requirements. In addition, the Contractor shall provide, for the life of the contract, the same protection for any person, including the Engineer or any of his authorized representatives, subcontractors, or any other person required to be exposed to such hazard in the performance of the work, inspection of the work, or any other reason. The Contractor's attention is also directed to Section 12.05 of these Standard Specifications as it applies to excavation.

Payment for work protection from caving ground in excavations during construction shall be made at the lump sum price, and no additional compensation will be made therefore. Payment shall include all materials, labor and equipment necessary to adequately brace, shore, shield or slope all excavations and trenches required by the California Labor Code Section 6705. Also included are any costs incurred by the Contractor in preparing a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during excavation of the trenches.

7.20 ASSIGNMENT OF CONTRACT

The Contractor shall not assign this contract, or any part thereof, without the approval of the City, not without the consent of surety unless the surety has waived its rights to notice of assignment. All assignments of funds are subject to the prior lien for services rendered or materials supplied for the performance of the work called for in favor of all persons, forms or corporations rendering such services or supplying materials.

7.21 AMENDMENTS TO CONTRACT

Each and every provisions of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and this contract shall be read and enforced as though it were included herein, and if through mere mistake, or otherwise, any such provision is not inserted, or is not correctly inserted, then upon the application of either party hereto, the contract shall forthwith be physically amended to make such insertion.

7.22 TERMINATION OR MODIFICATION OF CONTRACT, ENVIRONMENTAL REASONS

City may terminate, amend or modify the contract for environmental considerations. In the event of such termination, modifications or amendment, the notification to the Contractor

thereof will include a statement of the compensation payable, if any, by reason of such termination, modification or amendment. The provisions of Section 9.05 of these Standard Specifications shall apply to the filing and determination of any claim or claims of Contractor in connection with such termination, modification or amendment. In the event of termination, the thirty (30) day period therein referred to shall commence to run from the date of the notification of termination.

7.23 CITY'S RIGHT TO WITHHOLD PAYMENT

The City may withhold or nullify the whole or any part of any partial or final payment to such extent as may reasonably be necessary to protect the City from loss on account of:

a. Defective work not remedied, irrespective of when any such work be defective.

b. Claims or liens filed or reasonable evidence indicating probable filing of claims or liens.

c. Failure of the Contractor to make payments properly for labor, material, equipment, or other facilities, or to subcontractors.

d. A reasonable doubt that the work can be completed for the balance unearned.

Whenever the City shall, in accordance herewith, withhold any monies otherwise due the Contractor, written notice of the amount withheld and the reason therefore shall be given to the Contractor. When the Contractor shall remove the grounds for such withholding, the City shall promptly pay to the Contractor the amount withheld.

7.24 PROPERTY RIGHTS OF MATERIALS

Nothing in the contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil, or after payment has been made for ninety percent (90%) of the value of materials delivered to the site of the work, or stored subject to or under the control of the City. All such materials shall become the property of the City upon so being attached or affixed or upon payment of ninety percent (90%) of the value of the materials delivered to the site of the work or stored subject to or under the control of the City.

7.25 RIGHTS IN LAND AND IMPROVEMENTS

Nothing in these Standard Specifications shall be construed as allowing the Contractor to make any arrangements with any person to permit occupancy or use of any land, structure, or building within the limits of the contract for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the City and Owner, former Owner, or tenant of such land, structure or building.

The Contractor shall not occupy property outside the right of way as shown in the approved Construction Drawings or maps unless he enters into a rental agreement with the Owner. The agreement will be based on the fair rental values.

7.26 ACCEPTANCE OF CONTRACT

When the Engineer has made the final inspection and determines that the contract has been completed in all respects in accordance with the approved Construction Drawings, these Standard Specifications and the Special Provisions, the City Council, through the City Clerk, will issue a "Notice of Completion" of the contract, and immediately upon and after issuance of said "Notice of Completion", unless otherwise provided in the Special Provisions, the Contractor will be relieved of the duty of maintaining and protecting the work as a whole, will not be required to perform any further work thereon, and will be relieved of his responsibility for injury to persons or property or damage to the work which occurs after the formal acceptance by the City Council.

7.27 FINAL PAYMENT TO RELEASE THE CITY

The acceptance by the Contractor of the final payment shall be and shall operate as a release to the City of all claims and all liability, to the Contractor for all things done or performed for or relating to the work, and for every act and neglect of the City and others relating to or arising out of the work, excepting only his claims, if any, for amounts withheld by the City, upon final payment. No payment, however final or otherwise, shall operate to release the Contractor nor his Sureties from any obligation upon or under this contract of the Contractor's bond.

SECTION 8 - PROGRESS AND PROSECUTION

8.01 SUBCONTRACTORS

The Contractor shall indicate on the proposal form if provision is made thereon, or as soon as practicable after the signature of the contract, notify the Engineer in writing of, the names of subcontractors proposed for the work and shall not employ any that the Engineer may, within a reasonable time object to, as incompetent or unfit. Any substitution of subcontractors shall be submitted in writing to the City Engineer for his review and approval.

The Contractor agrees that he is fully responsible to the City for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

Nothing contained in the Contract Document shall create any contractual relation between any subcontractor and the City.

The purchase of concrete, liquid asphalt, paving asphalt, pipelines, valves, fire hydrants, casing, or any other materials produced at and supplied from established and recognized commercial plants together with delivery of such materials to the site of the work by means of vehicles owned or operated by such plants, or by recognized commercial hauling companies, shall not be considered as subcontracting under these Standard Specifications.

8.02 COMMENCEMENT OF THE WORK

Unless otherwise provided in the Special Provisions for a project, the Contractor shall commence work under the contract within fifteen (15) calendar days after issuance of the "Notice to Proceed" and shall diligently prosecute the same to completion within the time limit provided in the Special Provisions. Should the Contractor begin work in advance of receiving the "Notice to Proceed", as above provided, any work performed by him in advance of said date of approval shall be considered as having been done by him at his own risk and as a volunteer unless said contract is approved.

8.03 PROGRESS OF THE WORK

The Contractor shall notify the Engineer forty-eight (48) hours prior to beginning any work and in accordance with Section 5.10 of these Standard Specifications the Contractor shall submit for the Engineer's approval a schedule of operations at the time notification of commencement of work is given.

8.04 CLEAN-UP DURING CONSTRUCTION

Clean-up during construction shall include, but not be limited to, the removal of all excess soil and other materials or debris from the construction area, and sweeping and cleaning affected streets, and shall be accomplished as soon as practicable and as public necessity and convenience require, as determined by the Engineer.

Failure to comply with the time requirements set forth by the Engineer shall be sufficient

cause for the Engineer to temporarily suspend any portion of the work, or all work, until deficiencies are corrected, in accordance with Section 8.07 of these Standard Specifications.

Haul roads to and from excavation sites shall be cleaned and swept periodically during hauling operations. The Engineer may specify, whenever conditions warrant, the intervals at which cleaning and sweeping shall occur. Such prescribed intervals may vary between daily cleaning to weekly cleaning, as conditions may warrant.

No separate payment for clean-up during construction shall be made, and full compensation therefore shall be considered to be included in the various contract bid items of work.

8.05 FINAL CLEAN-UP

The Contractor shall clean-up and dispose of all excess materials and other debris in any right of way or ground occupied by him, and shall restore utilities and improvements on public or private property which have been damaged by his operations except for such items as have been specifically excepted in these Standard Specifications. The paved or oiled roadway in the work area shall be swept clean of dirt and debris upon completion of the work.

Should the Engineer determine that the Contractor or a Developer's Contractor is not diligently carrying out the required clean-up operations, the Engineer shall, in writing, notify the Contractor or Developer of the determination. The notification shall state the final date upon which the clean-up shall be completed and if the clean-up is not complete, the Engineer shall have the authority to order the work done by City forces and the cost thereof shall be deducted from any monies owed by Contractor or shall be levied as a fine against the Contractor.

Full compensation for final clean-up shall be included in the price bid for the various items of work, and no separate payment will be made therefore unless otherwise specified in the Special Provisions.

8.06 CHARACTER OF WORKMEN

If any subcontractor or person employed by the Contractor shall fail or refuse to carry out the directions of the Engineer or shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the requisition of the Engineer, and such person shall not again be employed on the work.

8.07 TEMPORARY SUSPENSION OF WORK

The Engineer shall have the authority to suspend the work wholly or in part, for such period as he may deem necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the work, or for such time as he may deem necessary, due to the failure on the part of the Contractor to carry out orders given, or to perform any provisions of the work. The Contractor shall immediately obey such order of the Engineer and shall not resume the work until the conditions are favorable and methods are corrected, as ordered or approved in writing by the Engineer.

Should the Contractor continue working after receiving a written order from the Engineer to suspend such work, no payment will be made to the Contractor for that portion of the work performed during such suspension.

Should the Contractor temporarily suspend work for any reason for a period of twenty-four (24) hours or more, exclusive of Saturdays, Sundays or Holidays, he shall notify the Engineer twenty-four (24) hours in advance of reinstituting any construction activity.

8.08 TIME OF COMPLETION AND LIQUIDATED DAMAGES

It is agreed by the parties to the contract that in case all the work called for under the contract is not completed before or upon expiration of the limit as set forth in the Special Provisions, damage will be sustained by the City, and that it is and will be impracticable to determine the actual damage which the City will sustain in the event of and by reason of such delay; and it is therefore agreed that the Contractor will pay to the City the sum of five hundred dollars ($500.00) per day for each and every day delayed beyond the time prescribed to complete the work; and the Contractor agrees to pay such liquidated damages as herein provided, and in case the same are not paid, agrees that the City may deduct the amount thereof from any money due or that may become due the Contractor under the contract. It is further agreed that in case the work called for under the contract is not finished and completed in all parts and requirements within the specified time, the City shall have the right to extend the time for completion or not, as may seem best to serve the interest of the City; and if the City decides to extend the time limit for the completion of the contract; the City shall further have the right to charge the Contractor, his heirs, assigns or sureties, and to deduct from the final payment for the work, all or in any part, as the City may deem proper, of the actual cost of engineering, inspection, superintending, and any overhead expense which are directly chargeable to the contract, and which accrue during the period of such extension, except that the cost of final surveys and preparation of final estimate shall not be included in such charges.

The Contractor shall not be assessed with liquidated damages nor the cost of engineering and inspection during any delay in the completion of the work caused by an act of God or of the public enemy, acts of the City, fire, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather or delays of subcontractors due to such causes; provided, that the Contractor shall, within ten (10) days from the beginning of such delay notify the Engineer in writing of the causes of the delay, and his finding of the facts thereon shall be final and conclusive.

8.09 USE OF COMPLETED PORTIONS

The City shall have the right to take possession of, use, or maintain and protect any completed portions of the work, however, taking possession, use, or maintenance and protection shall not be deemed an acceptance of any work not completed in accordance with the contract documents.

8.10 TERMINATION OF CONTRACT

If the Contractor should be adjudged as bankrupt, or if he makes a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he or any of his subcontractors should persistently violate any of the provisions of the contract, or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough skilled workmen or proper materials, or if he should fail to make prompt payment to the subcontractors or for materials or labor, or persistently disregard laws, ordinances or the instructions of the Engineer, then the City may, upon certificate of the Engineer when sufficient cause exists to justify such action, serve written notice upon the Contractor and his surety of its intention to terminate the contract, and unless within five (5) days after the serving of such notice, such violations shall cease and terminate.

In the event of such termination, the City shall immediately serve written notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract, provided, however, that if the surety within ten (10) days after the serving of the notice of termination does not give the City written notice of its intention to take over and perform the contract or does not commence performance thereof within the ten (10) days stated above from the date of serving of such notice, the City may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable, for the account and at the expense of the Contractor, and the Contractor and the surety shall be liable to the City for any excess cost occasioned the City thereby, and in such event the City may, without liability for so doing, take possession of and utilize in completing the work such materials, appliances, plant and other property belonging to the Contractor as may be on the site of the work and necessary therefore, In such case the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price shall exceed the expenses of finishing the work, including compensation for additional managerial and administration services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the City. The expense incurred by the City, as herein provided, and damage incurred through the Contractor's default, shall be certified by the Engineer.

SECTION 9 - MEASUREMENT AND PAYMENT

9.01 COST BREAKDOWN

Upon request of the Engineer, the Contractor shall submit in a form acceptable to the Engineer, a schedule showing the subdivision of his contract into its various parts, stating quantities and prices for each item, to be made a basis for checking or computing monthly estimates, if such payments are specified. The prices shall include all costs of each item. No payment will be made to the Contractor until such schedule has been submitted to and approved by the Engineer, if required by him.

9.02 CERTIFIED WEIGHTS

When payment is to be made on the basis of weight, the weighing shall be done on certified platform scales or, when approved by the Engineer, on a completely automated weighing and recording system and in accordance with Section 9 of the State of California Standard Specifications.

The Contractor shall furnish the Engineer with duplicate licensed weighmaster's certificates showing the actual weights. The City will accept the certificates as evidence of the weights delivered.

9.03 FULL COMPENSATION INCLUDED IN BID AMOUNT

The lump sums and/or unit prices shown in the proposal shall include full compensation for all work and expenses appurtenant to the accomplishment of the project described in these Standard Specifications in the manner indicated herein including, but not limited to, all items delineated in these contract documents for which specific bid items are not set up in the Proposal.

9.04 EXTRA WORK

Extra work, when ordered and accepted, shall be paid for under a written work order in accordance with the terms therein provided. Payment for extra work will be made at the unit price or lump sum price previously agreed upon by the Contractor and the Engineer and approved by the City.

When extra work is to be paid for on a force account basis, the Contractor shall receive actual cost of all materials furnished by him as shown by his paid vouchers, plus fifteen percent (15%), and for all labor for the said extra work he shall receive the actual wages paid in the accomplishment of said work, the rates for which shall have been previously determined and agreed to in writing by the Engineer and by the Contractor plus fifteen percent (15%). The price paid for labor by the Contractor shall include all payments imposed by State and Federal laws. The Contractor will be paid for the use of equipment at the rental rates listed for such equipment in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates": which is in effect on the date upon which work is accomplished regardless of ownership of such equipment and any rental or other agreement, if such may exist, for use of such equipment entered into by the Contractor. Said publication is hereby

made a part of these Standard Specifications. If it is deemed necessary by the Engineer to use equipment unlisted in the said publication, a suitable rental rate for such equipment will be established by the Engineer. The Contractor may furnish any cost data which might assist the Engineer in the establishment of such rental rate. The rental rates paid as above provided shall include the cost of fuel, oil, lubrication supplies and small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. To the equipment rental rate thus established shall be added the amount of fifteen percent (15%).

The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct costs of extra work paid for on a force account basis and the costs of other operations.

The Contractor shall furnish the Engineer report sheets in duplicate of each day's extra work paid for on a force account basis no later than the working day following the performance of said work. The daily report sheets shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, subcontractor, or other forces. The daily report sheet shall provide names or identifications and classifications of workmen, the hourly rate of pay and hours worked, and also the size, type and identification number of equipment and hours operated.

Material charges shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily report sheets, if available. Said daily report sheets shall be signed by the Contractor or his authorized agent.

The Engineer will compare his records with the daily report sheets furnished by the Contractor, make any necessary adjustment, and compile the costs of work to be paid for on a force account basis. The Compilation, when agreed upon and signed by both parties, shall become the basis of payment for the work performed.

Payment as provided above shall constitute full compensation for the Contractor for performance of work paid for on a force account basis, and no additional compensation will be allowed therefore.

9.05 NOTICE OF POTENTIAL CLAIM

The Contractor shall not be entitled to the payment of any additional compensation for any act or failure to act by the Engineer including failure or refusal to issue a change order, or for the happening of any event, thing, occurrence, or other cause unless he shall have given the Engineer due written notice of potential claim as hereinafter specified.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of costs involved, and, in so far as possible, the amount of the potential claim. The said notice as above required must have been given to the Engineer prior to the time that the Contractor shall have performed the work giving rise to the potential claim for additional compensation.

It is the intention of this Section, that differences between the parties arising under and by virtue of the contract, be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly

taken. The Contractor hereby agrees that he shall have no right to additional compensation for claim that may be based on any such act, failure to act, event, thing, or occurrence, for which no written notice of potential claim as herein required was filed.

9.06 PROGRESS PAYMENTS

The Contractor shall, once each month, cause an estimate in writing to be made of the total amount of the work done and acceptable material furnished and delivered by the Contractor on the ground and not used, or acceptable materials furnished and stored for use on the contract, if such storage is within the limits of the project, and is subject to or under the control of the City at the time of such estimate, and the value thereof. Such estimate shall be submitted to the Engineer for his review ten (10) days in advance of the date of the City Council meeting at which payment will be authorized. The Engineer shall have the authority to adjust the items as submitted on the estimate in accordance with his judgement of the amount of work performed or materials on hand.

The City shall retain ten percent (10%) of the value of the materials so estimated to have been furnished and delivered and unused or furnished and stored as afore-mentioned as part security for the fulfillment of the contract by the Contractor. The City shall also retain ten percent (10%) of the value of all work done from each monthly payment. In accordance with the provisions of California Government Code Section 4590, substitution of securities may be made for any monies withheld by the City to insure performance under this contract. At the request and expense of the Contractor, securities equivalent to the amount withheld pursuant to this Section shall be deposited with the City or with a State or Federally chartered bank as the escrow agent, who shall pay such monies to the Contractor upon satisfactory completion of the contract and the expiration of the specified time following recordation of the "Notice of Completion" as set forth in these Standard Specifications or the Special Provisions during which said amounts are subject to lien by labor and materials suppliers. Securities eligible for investment under this Section shall include those listed in California Government Code Section 16430, or bank or savings and loan certificates of deposit. The Contractor shall be the beneficial Owner of any securities substituted for monies withheld and shall receive the interest thereon.

The City shall pay monthly to the Contractor while carrying on the work the balance not retained, as aforesaid, after deducting there from all previous payments and all sums to be kept or retained under the provisions of the contract. No such estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the contract, or when, in his judgment, the total value of the work done since the last estimate amounts to less than three hundred dollars ($300.00).

No such estimate or payment shall be considered to be an acceptance of any defective work or improper materials.

The Contractor shall request such payment on a form approved by the Engineer which shall be properly completed and executed.

The estimated value of the work shall in no case exceed the price for the contract item of work in which the material is to be incorporated.

9.07 FINAL PAYMENT

The Engineer shall, after the completion of the contract, make a final estimate of the amount of work done there under, and the value of such work, and the City shall pay the entire sum so found to be due after deducting there from ten percent (10%) of the final estimate to be retained following final acceptance of the work. The final retained payment shall not be due and payable until the expiration of thirty-five (35) days from the date of recordation of the "Notice of Completion".

It is mutually agreed between the parties to the contract that no certificate given or payments made under the contract, except the final certificate or final payment, shall be conclusive evidence of the performance of the contract, either wholly or in part, and no payment shall be construed to be an acceptance of any defective work or improper materials.

And the Contractor further agrees that the payment of the final amount due under the contract, and the adjustment and payment for any work done in accordance with any alterations of the same, shall release the City, the City Council, and the Engineer from any and all claims or liability on account of work performed under the contract or any alteration therefore.

SECTION 10 - PORTLAND CEMENT CONCRETE, CEMENT MORTAR

10.01 DESCRIPTION

Portland Cement Concrete shall be composed of Portland Cement, fine aggregate, coarse aggregate and water, portioned and mixed as specified a combination of "Type II Modified" Portland Cement and mineral and mixture in Section 90, of the State of California Standard Specifications.

a. Class 2: Concrete shall contain five hundred ninety pounds (590 lbs, or 6 sacks) of Portland Cement per cubic yard with one inch (1") aggregate. Five inch (5") maximum slump. Three thousand pounds per square inch (3,000 psi) at twenty-eight (28) days for design purpose only.

b. Class 3: Concrete shall contain five hundred five pounds (505 lbs, or 5 sacks) of Portland Cement per cubic yard with one inch (1") aggregate. Five inch (5") maximum slump. Two thousand five hundred pounds per square inch (2,500 psi) at twenty-eight (28) days for design purpose only.

c. Class 4: Concrete shall contain four hundred twenty pounds (420 lbs, or 4 sacks) of Portland Cement per cubic yard with one inch (1") aggregate. Five inch (5") maximum slump. Two thousand five hundred pounds per square inch (2,500 psi) at twenty-eight (28) days for design purpose only.

The Class and minimum compressive strength of concrete shall be Class 3 or as required in these Standard Specifications for the items of work requiring Portland Cement Concrete.

10.02 MATERIALS

The materials for manufacturing Portland Cement Concrete shall conform to the following requirements:

a. Portland Cement, including Portland Cement used in precast products, shall be Type II cement conforming to the Specifications of ASTM Designation: C150, unless otherwise specified.

The Contractor shall make arrangements with the manufacturer of ready mixed concrete, or precast products to provide adequate facilities to assure that cement meeting the requirements specified herein will be kept separate from other cement in order to prevent any but specified cement from entering the work.

All cement not conforming to these Standard Specifications and all cement contaminated shall be removed immediately and not used in the work.

Water for washing aggregates and for mixing with concrete shall be free from oil or other impurities in sufficient amount to cause a significant change in the true setting, reduction in the compressive strength, discoloration of the concrete, or etching of the surface.

Coarse aggregate shall consist of gravel, crushed gravel, crushed rock, or combination thereof. It shall be free from deleterious coatings, roots, barks, sticks, rags and other extraneous

materials.

Regardless of source, all coarse aggregate shall be thoroughly and uniformly washed before delivery to the work.

Coarse aggregate, when sampled at the batching bin, shall have a cleanness value of not less than eighty-two (82) when subjected to the cleanness test performed in accordance with Test Method No. California 227.

Coarse aggregates shall be furnished in the following sizes determined in accordance with ASTM Designation: C136, as follows:

Percentage of Aggregate Passing Through Sieve

	Aggregate Size		
Sieve Size	1-1/2" to #4	1" to #4	3/4" to #4
2"	100		
1 - 1/2"	90 – 100	100	
1"	20 – 55	90 - 100	100
3/4"	0 – 15	60 - 95	90 - 100
3/8"	10 – 30	15 - 40	20 - 55
#4	0 – 5	0 - 10	0 - 10

The maximum size of coarse aggregate shall be as required in these Standard Specifications for the items of work requiring Portland Cement Concrete.

Coarse aggregate, when tested for soundness by the sodium sulphate test, ASTM Designation: C88, shall lose not more than ten percent (10%) by weight after five (5) cycles.

Fine aggregate shall be natural sand, or a combination of natural and manufactured sand. The aggregate shall be of such character that makes possible the production of a workable concrete within the limits of water content provided in Section 10.05 of these Standard Specifications. It shall be free from deleterious coatings, roots, barks, sticks, rags, and other extraneous material.

When testing in accordance with the test method of ASTM Designation: C40, fine aggregate shall not indicate a color darker than the reference standard color solution unless it is determined by the Engineer that a darker color is acceptable.

The fine aggregate shall contain not more than three percent (3%) by weight of materials passing the two hundred (200) mesh screen when tested in accordance with the test method of ASTM Designation: C136.

Fine aggregate shall be well graded and shall range in size uniformly within the following limits when tested in accordance with ASTM Test Method Designation: C136.

Sieve Size	Percentage Passing Sieves
3/8”	100
#4	90 - 100
8	65 - 90
16	45 - 75
30	20 - 45
50	10 - 20
100	0 - 8

10.03 READY MIXED CONCRETE

Ready mixed concrete shall be delivered to the job site of the work and discharge shall be completed within one and one-half (1½) hours after the addition of the cement to the aggregates or before the drum has been revolved two hundred fifty (250) revolutions, whichever comes first. In hot weather or under conditions contributing to quick stiffening of the concrete, the time between the introduction of the cement to the aggregates and discharge shall be less than one and one-half (1½) hours, as directed by the Engineer, except that concrete shall not be discharged once the temperature of the concrete has reached eighty-five degrees Fahrenheit (85° F).

Should water be added at the job site, the drum shall be revolved a minimum of twenty-five (25) revolutions after the introduction of such water.

The maximum size of coarse aggregate shall be as required in these Standard Specifications for the items of work requiring Portland Cement Concrete.

10.04 ADMIXTURES

No admixture shall be used without written permission from the Engineer or unless elsewhere provided for in these Standard Specifications or in the Special Provisions.

a. Calcium Chloride: When the use of calcium chloride is permitted or is specified in the Special Provisions, the calcium chloride shall conform to the specifications of ASTM Designation: D98.

b. Air-Entraining Agent: When the use of an air-entraining agent is permitted, or is specified in the Special Provisions, it shall be added at the rate designated by the Engineer to result in an air content of from three percent to six percent (3%-6%) by volume in the freshly mixed concrete.

10.05 AMOUNT OF WATER AND SLUMP TEST

The amount of water required for the proper consistency of concrete shall be determined by means of the Slump Test made in accordance with the Standard Method of Slump Test for

Consistency of Portland Cement Concrete of the AASHO Serial Designation: T-1 19-42 with subsequent amendments.

The amount of slump shall be twelve inches (12") minus the height after subsidence. The allowance for slump shall be as follows:

a. Cast-in-place pipe and concrete paving - not more than three inches (3").

b. All concrete structures - not more than three inches (3").

c. Concrete curbs, gutters and sidewalks - not more than five inches (5").

The amount of water used shall not exceed six and one-half gallons (6½ gal.) including moisture in the aggregate, per sack of cement for Class 2 concrete, and seven gallons (7gal.) per sack of cement for Class 3 concrete.

10.06 PROTECTING CONCRETE

Concrete for structures shall not be placed on frozen ground nor shall it be mixed or placed while the atmospheric temperature is below thirty-five degrees Fahrenheit (35° F), unless adequate means are employed to heat the aggregates and water, and satisfactory provisions have been made for protecting the work. Provisions satisfactory to the Engineer shall be taken to protect concrete about to be poured when there is danger of temperature dropping below thirty-five degrees Fahrenheit (35° F) within the next twenty-four (24) hours. Concrete damaged by frost action shall be replaced by the Contractor at his expense. Concrete shall not be placed when the atmospheric temperature in the shade in the vicinity of the work exceeds ninety-five degrees Fahrenheit (95° F), or when the temperature of the concrete exceeds eight-five degrees Fahrenheit (85° F).

All surfaces against which concrete is to be placed shall be free from standing water, mud, debris, and shall be firm enough to prevent contamination of the concrete by earth or other foreign material.

Absorptive surfaces against which concrete is to be placed shall be moistened thoroughly so that moisture will not be drawn from the freshly placed concrete.

10.07 FORMS

Forms shall be smooth, mortar right, true to the required lines and grades, and of sufficient strength to resist springing out of shape during the placing of the concrete. All dirt, chips, sawdust, nails, and other foreign matter shall be completely removed from the forms before any concrete is deposited therein. Forms previously used shall be thoroughly cleaned of all dirt, mortar, and foreign matter before being reused. Before concrete is placed in forms, all surfaces against which the concrete will be placed shall be thoroughly coated with form oil.

Prior to placing concrete, the Contractor shall have all forms checked by the Engineer for alignment and grade. Forms, reinforcing steel, or earth surfaces to receive concrete shall be wet prior to concrete placement.

10.08 CURING CONCRETE

When maximum daytime temperature exceeds fifty degrees Fahrenheit (50° F) all newly placed concrete shall be sprayed uniformly with a curing compound. Curing compound shall be applied at a nominal rate of one gallon per one hundred fifty square feet (1 gal/150 ft²), unless otherwise specified. Immediately after finishing, the exposed exterior surfaces of the concrete shall be cured by either the water method, pigmented curing compound method, or the waterproof membrane method, in accordance with Section 90-7, "Curing Concrete" of the State of California Standard Specifications, except that for cast-in-place concrete pipe only the waterproof membrane method shall be used as provided in Section 17.05.i of these Standard Specifications.

10.09 VIBRATOR

Whenever a structure requiring reinforcement is to be constructed, the Contractor shall provide one (1) or more portable vibrating machines to be used on such structures as directed by the Engineer. Full compensation for providing vibrating machines shall be considered as being included in the various bid items of work and no additional payment will be made therefore.

10.10 CEMENT MORTAR

Cement mortar shall be composed of one (1) part Portland Cement and two (2) parts of clean, well-graded sand of such a size that it will pass a number eight (#8) sieve. An admixture of hydrated lime, fire clay or diatomaceous earth may be used in the mortar to facilitate workability, and the amount of such material used will be limited as ordered by the Engineer. Quick setting cement may be used when necessary to facilitate the early backfilling of trench.

No mortar shall be used in which water has been added to the dry ingredients for a period of over thirty (30) minutes.

The consistency of mortar shall be such as to adhere to the ends of the pipe while being laid and be easily squeezed out of the joint when the pipe sections are squeezed together. Jointing and banding mortar shall be of such consistency that it will readily adhere to the pipe and/or structure.

10.11 CEMENT REQUIREMENTS

Concrete compressive strength requirements shall be the minimum strength at the age of twenty-eight (28) days as required in these Standard Specifications for the items of work requiring Portland Cement Concrete. The compressive strength of concrete will be determined from test cylinders which have been fabricated from concrete sampled and made in accordance with these Standard Specifications and with ASTM Designation: C3 1. Cylinders shall be tested in accordance with ASTM Designation: C39. Should the concrete used in the work fail to meet the minimum strength requirements as specified for the items of work, the Contractor shall, at his expense, make corrective changes in the material mix proportions or in

the concrete fabrication procedures, before placing additional concrete.

In addition to the aforementioned requirements, all such concrete represented by test cylinders which indicate a strength of less than the specified strength for the item of work will be rejected in accordance with the provisions of Section 6.04, "Defective Materials" of these Standard Specifications. Such rejection shall prevail unless the Contractor, at his expense, obtains and submits evidence of a type acceptable to the Engineer that the strength and quality of the concrete placed in the work are acceptable, or undertakes remedial action to correct the deficiency in a manner acceptable to the Engineer.

10.12 MEASUREMENT AND PAYMENT

Portland Cement Concrete will be measured and paid for in accordance with the provisions specified in the various sections of these Standard Specifications or the Special Provisions covering construction requiring concrete. Full compensation for cement mortar shall be considered as included in the bid items of work requiring the use therefore.

SECTION 11 - CLEARING AND GRUBBING

11.01 DESCRIPTION

This work shall consist of removing all objectionable material from within the street or alley right of way, along the site of pipeline construction or fence construction, and such other areas as may be designated in the approved Construction Drawings or the Special Provisions to be cleared and grubbed. Clearing and grubbing operations shall be performed in advance of construction operations and in accordance with these Standard Specifications and with the appropriate sections of the State of California Standard Specifications.

11.02 PROTECTION OF EXISTING IMPROVEMENTS

The Contractor's attention is directed to Section 7.13, "Preservation of Property" of these Standard Specifications. Only those items or areas designated or marked shall be removed or cleared.

11.03 CONSTRUCTION

Clearing and grubbing shall conform to the provisions in Section 16 of the State of California Standard Specifications and these Standards Specifications.

Unless otherwise specified, the entire area within the project limits shall be cleared and grubbed. No payment will be made to the Contractor for clearing and grubbing outside these limits, unless such work is authorized by the Engineer.

All of the work shown in the approved Construction Drawings and included in these Standard Specifications and the Special Provisions that is located in the public streets in the City of Visalia, shall be done in accordance with City Ordinances regulating the use of public streets within the City, except as otherwise provided herein. (See Title 10, Chapter 8, City of Visalia, California Municipal Code.)

The Contractor shall inform himself as to all regulations and requirements of the City of Visalia and shall conduct his operations in compliance therewith.

The Contractor shall remove and dispose of all pavement, vegetation growth, such as brush, trees, stumps, roots, grass, and all rubbish, debris, or structures from the work site or other areas designated to be cleared and grubbed. No such material will be allowed in or under backfill material or embankments. Trees and other vegetation not to be removed shall be protected from damage in accordance with Section 7.12 of these Standard Specifications.

Within the limits of clearing, all stumps, large roots, buried logs, and all other organic material shall be removed three feet (3') below the existing ground surface or six feet (6') below finished grade, whichever is deeper.

Concrete removal shall conform to the provisions in Section 15 of the State of California Standard Specifications and these Standard Specifications. Where a portion of an existing concrete facility is to be removed, it shall be cut to a minimum depth of one and one-half inches (1½") with an abrasive type saw at the first scoring line at, or outside, the planed joint

and removed without damage to any portion that is to remain in place. If curbs and gutters cannot be cut off square and neat, the entire curb and gutter shall be removed to the nearest weakened plane or expansion joint. No patching at expansion joints will be permitted.

All concrete (Portland or Asphalt) and oil dirt within the right of way shall be removed by the Contractor unless designated to remain on the approved Construction Drawings. Existing drain wells, drainage structure, irrigation lines, structures and headwalls to be abandoned shall be removed to at least two feet (2') below the surface and backfilled. Manholes to be abandoned shall be abandoned as specified in Section 19.02.e of these Standard Specifications.

Where existing house foundations and floor slabs overlap into the project area, the whole foundation will be removed. The portion beyond and outside the project area will be considered within the project area and included in the bid price of removing concrete.

Tree branches extending over the roadway which interfere with the work shall be trimmed by the City at the request of the Contractor upon forty-eight (48) hours prior notice to the time such removal is required.

11.04 REMOVAL AND DISPOSAL OF MATERIALS

Disposal of removed material shall be done in accordance with the State of California Standard Specifications, Section 7-1.13 and the Special Provisions.

Compensation for all costs involved in disposing of materials as specified including all costs of hauling shall be included in the payment for clearing and grubbing as stated herein or in the Special Provisions and no additional payment will be made therefore.

11.05 PAYMENT

Where a contract item is provided, clearing and grubbing will be paid for on a lump sum basis. Where no contract item is provided, the cost for clearing and grubbing shall be included in the various bid items requiring clearing and grubbing or as set forth in the Special Provisions and no additional payment will be made therefore.

The lump sum price paid, or the price paid when included with other items, for clearing and grubbing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in clearing and grubbing as shown on the approved Construction Drawings, as specified in these Standard Specifications, or the Special Provisions, and as directed by the Engineer, including the removal and disposal of all the resulting materials.

SECTION 12 - EARTHWORK

12.01 DESCRIPTION

This work shall consist of performing all excavation and/or placing compacted fill to prepare the roadway prism and area adjacent thereto for the placement of improvements as shown in the approved Construction Drawings. The work shall also include any excavation and backfilling required to install structures, sewer pipelines, storm drain pipelines, water lines, and other underground conduits, and their appurtenances at the locations and to the lines and grades as shown in the approved Construction Drawings, as shown in the Engineering Improvement Standards, and as specified in these Standard Specifications, the Special Provisions, in conformance with Section 19 of the State of California Standard Specifications and as directed by the Engineer.

12.02 PRESERVATION OF PROPERTY

The Contractor's attention is directed to Section 7.13 of these Standard Specifications regarding preservation of existing improvements and utilities.

Prior to starting excavation and subgrade preparation, the Contractor shall lower all existing manholes and water valve casings and lids to a depth of six inches (6") below the finish elevation of the subgrade.

All frames and lids for manholes and water valves shall be inspected by the Engineer and judged as to their suitability for reuse on the job. If they are found unsuitable, they shall be salvaged in accordance with Section 6.06 of these Standard Specifications. New lids and frames will be supplied by the City. No additional payment will be made to the Contractor for salvaging the unsuitable frames and lids and utilizing those supplied by the City.

The existing frame and lid for manholes, if in acceptable condition, may be temporarily mortared to the existing manhole cone or the Contractor shall supply a temporary metal lid to cover the opening of the manhole and store the existing manhole frame and lid for use later to raise the manhole to grade.

Water valve casings shall be lowered to six inches (6") below the finish elevation for the subgrade and covered, if in acceptable condition, with the existing valve cover or covered with some other means acceptable to the Engineer.

Prior to covering up any manholes or water valves that have been lowered, the Contractor shall reference their locations so as to facilitate the raise of the manholes or water valves to grade at a later date.

The Contractor shall return after the final street paving has been placed and raise to grade, in accordance with Sections 13, 14, 19, and 20 of these Standard Specifications, all manholes and water valves lowered as a result of roadway excavation.

Payment for lowering, protecting and returning to raise to grade manholes and water valves shall be made on the unit price bid per each and shall include full compensation for furnishing all labor, materials, tools, equipments, and incidentals, and doing all work involved in lowering, protecting, covering, and returning to raise to grade all manhole and water valves as

shown in the approved Construction Drawings, on the Engineering Improvement Standards, and as specified in these Standard Specifications, the Special Provisions, and as directed by the Engineer.

12.03 DISPOSAL OF UNSUITABLE AND EXCESS MATERIAL

All excess and unsuitable material shall be removed and disposed of in accordance with Section 7-1.13 of the State of California Standard Specifications.

12.04 ROADWAY EXCAVATION

a. Description: Roadway excavation shall consist of all excavation involved in the grading and construction of roadway improvements, including paving, concrete curbs and gutters, sidewalks, alley approaches, driveway approaches, and valley gutters. All work shall conform to Section 19-2 of the State of California Standard Specifications and these Standard Specifications.

b. Compaction: Relative compaction within the public right of way shall be determined by Test Method California No. 216.

   Compactive effort shall be applied to all areas where pavement or concrete improvements are to be placed or constructed. The relative compaction under paving areas and under curb and gutter shall be ninety five percent (95%) and under sidewalks shall be ninety percent (90%) to a depth of six inches (6") below the finish grade of the subgrade in excavation. The relative compaction of all embankment material shall be ninety percent (90%).

   The cost of compaction under paving areas shall be included in the cost of roadway excavation.

   The cost of compaction under concrete improvements shall be included in the various bid items for concrete improvements.

   No compaction tests of subgrade shall be made until such time as the subgrade is finished to within one-tenth of one foot (0.1') of finished subgrade and the Engineer has been notified of the time that such compaction tests will be made. The Engineer shall specify the locations where compaction tests are to be made.

   Compaction testing shall be provided in accordance with Section 6.02 of these Standard Specifications.

c. Imported Borrow: All imported borrow shall have a minimum "R" value of fifty (50) unless the approved Construction Drawings or the Special Provisions indicate otherwise. Testing to determine the "R" value of the imported borrow shall be made in accordance with Test Method California No. 301 of the State of California Standard Specifications and shall be at the expense of the Contractor.

d. Subgrade: The preparation of subgrade for all paved areas shall conform to the

provisions of Section 19 of the State of California Standard Specifications and these Standard Specifications. Relative compaction of the subgrade shall be ninety percent (90%) as previously specified.

The subgrade shall be accurately graded and compacted to proper profile and cross-section and at elevations which will result in the proper final grades when the specified thicknesses of aggregate subbase, base, and/or paving have been applied. The finished subgrade shall not vary from the planned grade by more than five hundredths of one foot (0.05') at any point. The Contractor shall not place any aggregate subbase or base material or asphalt paving until the subgrade is in a condition satisfactory to the Engineer.

e. Miscellaneous Highway Facilities: The removing, reconstructing, adjusting, remodeling, and salvaging of the various highway facilities shall conform to the provisions in Section 15 of the State of California Standard Specifications and these Standard Specifications.

All miscellaneous highway facilities within the highway right of way noted on the approved Construction Drawings to be removed, shall be removed and disposed of by the Contractor.

f. Payment: Quantities of roadway excavation shall be paid at the contract unit price per cubic yard and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals required to excavate, grade, and compact the subgrade and to remove, replace, adjust, remodel, and salvage any existing highway improvements designated in the Special Provisions in order to perform the required work on the subgrade and no additional payment will be made therefore.

12.05 TRENCH AND STRUCTURE EXCAVATION

a. Description: Trench and structure excavation shall consist of performing all excavation required to properly install or construct the various types of pipelines, conduits, and their appurtenant structures. All excavations shall be made in accordance with the Trench Construction Safety Orders issued by the Division of Industrial Safety of the Department of Industrial Relations of the State of California and these Standard Specifications.

b. Permits: The Contractor shall obtain permits from the State Division of Industrial Safety or any other permit that may be required by the work or as required by law, prior to commencing any excavation within the street, with no additional compensation therefore.

c. Trench and Structure Excavation: Excavations shall be made to the depths and widths required to accommodate construction of pipelines and structures to specified dimensions, and to the lines and grades indicated in the approved Construction Drawings and, in the case of sewer and water house branches, in accordance with the Engineering Improvement Standards. Storm drain laterals, (pipelines that connect the storm drain inlet to the main storm drain) shall be

installed at the depth and grade specified by the Engineer after exposing of existing intersecting utilities by the Contractor.

The location of subsurface utilities or other obstructions may necessitate a change in location or depth of the main pipeline, house service or lateral, which depth or surface location shall be determined in the field by the Engineer. Changes in main line pipe alignment either horizontally or vertically shall be paid as specified in Section 5.13.d of these Standard Specifications.

The Contractor, however, shall allow in his bid price for the various house service or lateral pipe installation quantities full compensation for any increase or decrease in anticipated depth of trench because of the location of intersecting utilities, shown on the approved Construction Drawings or not.

When a trench or structure site is to be located in an existing paved area, the existing paving to be removed shall be cut by methods approved by the Engineer along neat lines on each side of the trench or around the structure site. Existing paving at any location shall be removed from proposed trench areas or structure sites no sooner than forty-eight (48) hours prior to excavation at that location. No paving shall be removed on Friday unless excavation and follow-up work will occur the same day.

Existing paving, when removed, shall be kept separated from the material which is to be returned to the excavation. Failure to comply with this requirement shall be grounds for rejection of the material for use as backfill.

Structures and pipes shall be constructed or placed as soon as practicable after excavation, but in no case shall a trench be excavated more than sixteen (16) hours before pipe construction. No trench shall be excavated on Friday that is not to receive pipe on the same day.

Not more than six hundred linear feet (600’) of trench shall be open ahead of any storm drain, sewer water pipeline, or any conduit in any street or alley, except that upon written permission of the City Engineer such trenches may be opened for a distance of not more than one thousand two hundred linear feet (1,200’) where public traffic will not be seriously inconvenienced.

Trenches for pre-cast pipe shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe.

Trenches for cast-in-place pipe shall be graded and prepared to provide full, firm and uniform support by undisturbed earth or compacted fill throughout the bottom two hundred twenty degrees (220°) of the pipe periphery.

For pre-cast pipe trenches, if rock, hardpan or like materials are encountered, it shall be removed to a depth of six inches (6”) below the grade of the bottom of the pipe. The space shall be backfilled with suitable material containing sufficient moisture to produce maximum compaction, and shall be free from lumps or other unsuitable material. The imported earth shall be compacted to the satisfaction of the Engineer, and finish graded to the original lines and grades as provided above

for pre-cast and cast-in-place pipe. No additional payment will be made for such excavation or backfill.

In all trenches or structure sites where a firm foundation is not encountered, such as soft, spongy, or otherwise, unsuitable material, the material shall be removed to a minimum of twelve inches (12"), or to a depth determined by the Engineer, below the bottom of the pipe or structure, and the space backfilled with suitable material containing sufficient moisture to produce maximum compaction. The backfill material shall be free from lumps or other unsuitable material, and when compacted to the satisfaction of the Engineer shall be finish graded as provided above for precast and cast-in-place pipe, or as required by the Engineer for structures. No additional payment will be made for such additional excavation or backfill.

All existing gas pipes, water pipes, conduits, sewers, drains, fire hydrants, and other structures which are not, in the opinion of the Engineer, required to be changed in location shall be carefully supported and protected from injury by the Contractor, and in case of injury, shall be restored by him, without additional compensation, to as good a condition as that in which they were found and to the satisfaction of the Owner and the Engineer, in accordance with Section 7.12 of these Standard Specifications.

d. Maintaining Drainage Within Trenches and Structures: Reference is made to Section 4.11 of these Standard Specifications. The Contractor shall keep trench and structure excavations as dry as practicable throughout the construction period, subject to the requirements of these Standard Specifications Section 10, "Portland Cement Concrete, Cement Mortar". Payment for cost or repair of trenches damaged because of failure to provide temporary drainage control shall be included in the various bid items of work and no additional compensation will be paid therefore.

e. Disposal of Excess Materials: The Contractor shall acquire a suitable site for the disposal of excess material, including existing paving removed for trenching operations, in accordance with Section 7-1.13 of the State of California Standard Specifications.

Full compensation for acquiring the site and disposing of excess material shall be included in the prices paid for the various items of work requiring excavation.

f. Payment: Trench excavation and structure excavation will be paid for in accordance with the provisions specified in the various sections of these Standard Specifications covering construction requiring trench or structure excavation.

12.06 TRENCH AND STRUCTURE BACKFILL

a. Description: Trench and structure backfill shall consist of the proper backfilling of trenches and around structures after the placement or construction of the various types of pipelines, conduits and their appurtenant structures. All work shall be done in accordance with these Standard Specifications.

b. Material for Trench and Structure Backfill: Unless otherwise specified, shall be native material free from debris, lumps, hardpan chunks, paving material, organic matter or other deleterious or unsuitable substances. Backfill material shall be approved by the Engineer before being used in the work.

c. Trench Backfill (Pre-Cast Pipe): Backfill for trenches in which pre-cast pipe has been installed shall be placed in two phases, classified as Initial Backfill and Final Backfill.

Initial backfill for pipes up to and including fifteen inches (15") in inside diameter, shall consist of placing and firmly compacting by hand tamping, in six inch (6") lifts, select native material at optimum moisture under the haunches, on each side, and on the top of the pipe to an elevation of six inches (6") above the top of the pipe.

Initial backfill for pipes of inside diameter greater than fifteen inches (15") shall consist of placing and firmly compacting backfill material under the haunches of the pipe, as directed by the Engineer, so as to form a firm bedding for the pipe. The material shall be placed and compacted to a depth sufficient to prevent movement of the pipe during jointing operations or during final backfill and compaction operations.

Final backfill shall consist of placing backfill material into the remaining trench cavity following completion of initial backfill. Backfill material shall be returned to the trench in lifts not to exceed nine inches (9") in depth. Each lift shall be jetted to the bottom of the lift prior to placement of the next lift of backfill material. In no case shall backfill material be allowed to free-fall directly onto the pipe. Final backfill shall be accomplished as soon as practicable, except that for mortar joint concrete pipe final backfill shall not be placed until, in the opinion of the Engineer, the cement in the joints has acquired a suitable degree of hardness. In no case, however, shall final backfill follow initial backfill by more than twenty-four (24) hours, not initial excavation by more than forty-eight (48) hours.

At locations where traffic, safety, or other considerations warrant, the Engineer may order the immediate backfill of trenches, regardless if the pipe was installed or not. Where pipe was not installed, the trench shall not be re-excavated until provisions are made to prevent the conditions which caused the backfill to be ordered. No additional compensation will be paid for backfill and re-excavation.

d. Trench Backfill (Cast-in-Place Concrete Pipe): Backfill for trenches in which cast-in-place concrete pipe has been constructed shall consist of placing backfill material into the remaining trench cavity. Backfill shall be accomplished as soon as practicable and shall follow pipe construction by no more than two (2) working days, provided that in no case shall backfill material be placed over the pipe sooner than twenty-four (24) hours following construction of the pipe. Backfill material shall be returned to the trench in lifts not to exceed nine feet (9') in depth. Each lift shall be jetted prior to placement of the next lift of backfill material. In no case shall backfill material be allowed to free-fall directly onto the pipe.

Compaction of backfill shall conform to the requirements of Section 12.06.g of

these Standard Specifications.

e. Structure Backfill: Structure backfill shall consist of placing and compacting backfill material around structures to the lines designated in the approved Construction Drawings or directed by the Engineer.

Compaction shall conform to the requirements of Section 12.06.g of these Standard Specifications.

f. Backfilling (General): Where as excavation or trench crosses a street or alley intersection, the excavation and backfilling shall be completed within twenty-four (24) hours, or bridging capable of supporting vehicular traffic shall be provided for access across said excavation or trench.

An excavation within a street or alley for the purpose of boring or jacking pits or for the installation of structures shall be properly barricaded and protected and may be left open for a period of seven (7) days and then must be backfilled, unless an extension of time is approved by the Engineer in writing.

Within twenty-four (24) hours after the trench has been backfilled, all street crossing shall be surfaced with temporary surfacing of two inches (2") of cold mix surfacing which shall be placed and maintained as specified in Section 15.03 of these Standard Specifications. Nothing herein shall be construed to mean that permanent surfacing cannot immediately be placed provided subgrade, subbase, and base compaction requirements are satisfied.

All trenches under existing curb and gutter or other City structures shall require a slurry cement backfill of not less than one hundred eighty-eight pounds (188 lbs) of cement per cubic yard of material produced.

g. Compaction: Trench and structure backfill shall be placed and compacted in uniform layers and shall be brought up uniformly on all sides of the structure, facility, or pipe utilizing approved compaction equipment. The thickness of each layer of backfill shall not exceed sixty-seven hundredths of one foot (0.67') before compaction except that when compaction by ponding or jetting is permitted, said thickness shall not exceed four feet (4'). Compaction of trench and structure backfill may be accomplished by jetting only with prior approval of the Engineer. Such jetting, if approved, shall be supplemented by approved compaction equipment. Relative compaction of trench and structure backfill shall be determined by the laboratory standard of test procedure Test Method California No. 216. Trench or structure backfill shall have a relative compaction of not less than ninety percent (90%) to within twenty-four inches (24") of the surface, and the remaining top twenty-four inches (24") shall have a relative compaction of not less than ninety-five percent (95%), except that base material shall have a minimum relative compaction of ninety-five percent (95%).

The Contractor shall contact the Department of Public Works concerning the use of water from the City's water system for any construction activities.

Compaction for trenches in which pre-cast pipe has been placed may proceed

immediately following placement of final backfill.

Compaction for trenches in which cast-in-place pipe has been placed or excavation sites in which structures have been constructed shall proceed according to the following requirements. Jetting may proceed no sooner than forty-eight (48) hours after construction of the pipe or structure; follow-up compaction using equipment which imparts load on the pipe or structure shall not proceed for a minimum of seven (7) days following placement of the pipe or structure, unless this requirement is specifically waived by the Engineer, or is otherwise specified.

Compaction testing shall be provided as specified in Section 6.02 of these Standard Specifications.

h. Measurement and Payment: Trench and Structure backfill and compaction will be paid for in accordance with the provisions specified in the various sections of these Standard Specifications covering construction requiring trench or structure backfill.

SECTION 13 - AGGREGATE SUBBASES AND BASES

13.01 DESCRIPTION

This work shall consist of furnishing, spreading, and compacting aggregate subbases and bases as specified in Sections 25 and 26 of the State of California Standard Specifications and these Standard Specifications.

13.02 MATERIALS

Aggregate for subbases and bases shall be clean from vegetable matter and other deleterious substances, and shall be of such nature that it can be readily compacted under watering and rolling to form a firm, stable base.

13.03 GRADING

Aggregate subbase or base shall not be placed until the subgrade has been finished to a condition satisfactory to the Engineer and when placed, shall be accurately graded and compacted to proper profile and cross-section and at elevations which will result in the proper final grades when the specified thickness of paving has been applied and shall not vary from the planned grade by five hundredths of one foot (0.05') at any point for aggregate subbase and five hundredths of one foot (0.05') for aggregate base.

Placing of the aggregate subbase or base shall conform to the requirements of Sections 25-1.04 and 26-1.04 respectively of the State of California Standard Specifications except that use of a motor grader will be permitted.

13.04 COMPACTION

The relative compaction of each layer of compacted aggregate subbase material shall not be less than ninety percent (95%) and each layer of aggregate base shall be not less than ninety-five percent (95%) as determined by Test Method California No. 216. Compaction testing shall be provided as specified in Section 6.02 of these Standard Specifications.

13.05 AGGREGATE SUBBASE

Aggregate subbase shall conform to Section 25 of the State of California Standard Specifications. The class of aggregate subbase shall be as specified in the Special Provisions.

13.06 AGGREGATE BASE

Aggregate base shall be Class 2 and shall conform to the provisions in Section 26 of the State of California Standard Specifications. The gradation of the Class 2 aggregate base shall be as specified for three-quarters of one inch (¾") maximum aggregate.

13.07 SALVAGING EXISTING PAVEMENT

Where allowed, aggregate subbase or base may be composed of salvaged oiled earth and asphalt concrete (A.C.) from the existing roadway, supplemented with imported aggregate base material. The Engineer may require a thicker base section in order to compensate for a decreased "R" value of salvaged pavement. Unless otherwise specified, the Contractor shall pay for testing of "R" values for salvaged materials. When this system is used, the salvaged oiled earth material to be used by the Contractor shall be pulverized to a maximum diameter of two inches (2"). This pulverized, salvaged material shall be spread and compacted evenly over the entire subgrade area to the depth specified in the Special Provisions. The imported aggregate base is then to be spread and compacted evenly over the top of the compacted, pulverized, salvaged material to provide the required depth of base.

Where salvaging existing oil or A.C. for base is allowed, this salvaged material will not be allowed in the top two inches (2") of the base section; a minimum of two inches (2") of imported aggregate base will be required to insure a smooth, uniform surface on which to place pavement. Any surplus oil or pavement created because of this requirement shall be removed and disposed of by the Contractor as specified in Section 7-1.13 of the State of California Standard Specifications and no additional payment will be made therefore.

13.08 ADDITIONAL QUANTITIES

In the event that soil conditions are encountered such that a satisfactory subgrade, subbase or base for pavement may not be obtained, the material lying below the subgrade shall be removed and the additional subbase or untreated base material, as directed by the Engineer, shall be placed in accordance with the provisions of this section. All additional roadway excavation will be paid on a cubic yard basis. The additional volume of work shall be calculated by the "Average End Area" method.

Additional aggregate subbase or base shall be paid on the basis of bid item specified.

13.09 MEASUREMENT AND PAYMENT

a. Aggregate Subbase: Aggregate subbase shall be paid by the cubic yard. Quantities shall be calculated by the "Average End Area" method on the basis of the dimensions shown in the approved Construction Drawings, adjusted by the amount of any change ordered by the Engineer. Payment for aggregate subbase shall be made at the contract unit price per cubic yard for the class specified and shall include full compensation for furnishing all labor, materials (or processing selected materials), tools, equipment, and incidentals, and doing all work involved in hauling and constructing aggregate subbase, including pulverizing existing surfacing if required, completed, in place, as shown in the approved Construction Drawings, as specified in these Standard Specifications and the Special Provisions, and as directed by the Engineer.

b. Aggregate Base: Aggregate base shall be paid by the ton. Quantities shall be measured in accordance with the provisions of Section 9.02 of these Standard

Specifications.

Payment for the weight of material will be determined by deducting from the weight of material delivered to the work, the weight of water in the material at the time of delivery to the job, as determined by Test Method California No. 226, in excess of one percentage (1%) point more than the optimum moisture content as determined by Test Method California No. 216. Payment for the weight of water deducted as provided herein shall not be made. Tests ordered by the City Engineer shall be made at the expense of the City. Payment for aggregate base shall be made at the contract unit price per ton and shall include full compensation for furnishing all labor, materials, (including water in the material at the time the material is delivered to the job as previously provided), tools, equipment, and incidentals, and for doing all work involved in hauling and constructing aggregate base, (including pulverizing existing surfacing), complete, in place, as shown in the approved Construction Drawings, and as specified in these Standard Specifications and the Special Provisions, and as directed by the Engineer.

SECTION 14 - ASPHALT CONCRETE PAVEMENT

14.01 DESCRIPTION

Asphalt concrete pavement shall consist of furnishing and mixing aggregate and asphalt binder at a central mixing plant and spreading and compacting the mixture and applying prime coat, paint binder, and seal coat to or with the mixture, in accordance with Section 39 of the State of California Standard Specifications and these Standard Specifications.

14.02 AGGREGATE MATERIAL

All aggregates shall be clean and free from decomposed materials, organic materials, and other deleterious substances and conform to Section 39 of the State of California Standard Specifications. Gradation of the aggregate shall conform to the grading requirements for three-fourths of one inch (¾") maximum aggregate (medium) and one-half of one inch (½") maximum aggregate (medium).

14.03 ASPHALT CONCRETE

Asphalt concrete shall be Type B and shall conform to the provisions of Section 39 of the State of California Standard Specifications. The asphalt binder shall be steam refined paving asphalt classified as PG 64-10 in accordance with Section 92 of the State of California Standard Specifications.

14.04 SPREADING, LAYING AND COMPACTING

Spreading and laying operations shall conform to the requirements of Sections 39-5 and 39-6 of the State of California Standard Specifications. Where the total depth of paving exceeds two-tenths of one foot (0.20'), the top layer of asphalt concrete shall not exceed two-tenths of one foot (0.20') in compacted thickness. The aggregate for this layer and all lower layers shall be three-fourths of one inch (¾") maximum aggregate (medium). The next lower layer shall not exceed twenty-five hundredths of one foot (0.25') in compacted thickness. Any lower layers shall not exceed twenty-five hundredths of one foot (0.25') in compacted thickness.

No asphalt concrete paving shall be placed when the atmospheric temperature is below fifty degrees Fahrenheit (50º F) and at the discretion of the Engineer. Compaction operations shall conform to the requirements of Section 39-6.03 of the State of California Standard Specifications.

14.05 PRIME COAT

Prime coat shall be applied as specified in the Special Provisions.

14.06 SEAL COAT

Seal coat shall be applied as specified in the Special Provisions.

14.07 PAINT BINDER

Paint binder shall be furnished and applied in accordance with the provisions in Section 94, "Asphaltic Emulsions," of the State of California Standard Specifications, and shall be applied to all vertical surfaces of existing pavement, curbs, gutters, and construction joints in the surfacing against which additional material is to be placed, to a pavement to be surfaced, and to other surfaces designated by the Engineer.

The rate of application of the paint binder shall be five hundredths of one gallon per square yard ($0.05 gal/yd^2$) of surface covered. Full compensation for furnishing and applying the paint binder shall be included in the price bid for items requiring its application and no additional payment will be made therefore.

14.08 ASPHALT CONCRETE DIKES

Asphalt concrete dikes shall be constructed as shown in the approved Construction Drawings and in accordance with the Special Provisions. Only equipment specifically designed to install dikes shall be used for such installation. Payment for the specified asphalt concrete dike shall be as specified in the Special Provisions.

14.09 MEASUREMENT AND PAYMENT

Asphalt concrete pavement shall be measured by weight of the mixture complete, as specified in Section 9.02 of these Standard Specifications. Payment for the installation of asphalt concrete pavement shall be made at the contract unit price per ton and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, including furnishing and applying asphalt paint binder, and for doing all work involved in constructing and placing asphalt concrete paving complete, as shown in the approved Construction Drawings, as specified in these Standard Specifications and the Special Provisions, and as directed by the Engineer.

SECTION 15 - RESTORATION OF SURFACES

15.01 DESCRIPTION

Restoration of surfaces shall consist of restoring the surfaces of all trenches, surfaces at or around structure sites, or any other surfaces damaged or disturbed by the work, to the condition existing prior to commencement of the work, or to such condition specified by any encroachment permit issued by the City for the work, or as specified in the Special Provisions. Surfaces shall include, but not be limited to, pavement of any kind, grass, shrubbery or other landscaping, gravel, treated or untreated soil. All work shall be done in accordance with these Standard Specifications.

15.02 PAVEMENT REPLACEMENT

Replacement of pavement shall conform to the minimum requirements specified herein, and to the requirements of Sections 13 and 14 of these Standard Specifications and the Engineering Improvement Standards, unless modified by the Special Provisions or encroachment permit issued by the City. Deviation from these requirements, unless approved by the Engineer shall be cause for rejection of the work.

If aggregate base material is removed, it may be allowed to be replaced with nine inches (9") minimum depth with new aggregate base in accordance with Section 13 of these Standard Specifications provided the same gravel equivalent thickness of base and paving as shown on the Standard Plan sections is maintained as determined by the Engineer.

Replacement of pavement shall be one inch (1") thicker than existing (3" minimum) and performed in a manner consistent with good construction practices and methods, shall be approved by the Engineer, and which, when completed, shall leave all areas requiring replacement of pavement with as neat an appearance as possible. When pavement replacement is within less than eight (8) years old pavement it shall be required to have seamless joints with the existing pavement by using a heater–remix process.

Pavement replacement shall be accomplished as soon as possible and practicable, and within the time limits specified in the Special Provisions.

Areas to receive pavement replacement shall be completely cleaned of all debris, rubbish, dirt, temporary paving, or any other deleterious material which might affect the quality of the work in any way. Cleaning shall be accomplished to a minimum of six feet (6') outside the edges of trenches or other areas to receive pavement replacement. This distance may be increased by the Engineer as necessary to prevent contamination of the new work.

Where saw-cutting of existing pavement edges is specified, the cut shall be made on a straight line along both sides of trenches, and to neat lines around structures or other locations requiring pavement replacement. The cut shall be made a minimum of three inches (3") in depth, or such other depth as may be specified in the Special Provisions, and shall encompass all pavement damaged by the work or specified to be removed or replaced.

All edges of existing pavement, whether trimmed or saw-cut, shall be protected from damage. Any edges damaged from any cause prior to or during paving operations, shall be re-cut or re-trimmed as directed by the Engineer, and no additional payment will be made therefore.

A paint binder of asphaltic emulsion shall be furnished and applied in conformance with Section 14.07 of these Standard Specifications to all vertical surfaces of existing pavement, curbs, gutters, or other surfaces against which asphalt concrete pavement is to be placed. Paint binder shall also be applied to the top surface of the initial layer of asphalt concrete if the pavement is to be replaced in lifts.

When replacing pavement in areas where saw cutting of existing pavement is specified, the new pavement material shall overlap the existing pavement edge as directed by the Engineer to a maximum of six inches (6") and "feathered" to match the existing paving. When compacted, the surface shall be smooth and without humps or depressions.

15.03 TEMPORARY PAVEMENT REPLACEMENT

Unless otherwise specified or unless otherwise required by an encroachment permit for the work, temporary replacement of existing pavement, where specified or directed to be placed by the Engineer, shall consist of a minimum thickness of two inches (2") of cut-back or "cold mix" asphalt concrete. The temporary pavement shall be diligently maintained by the Contractor until permanent pavement is installed.

15.04 MISCELLANEOUS SURFACE RESTORATION

Restoration of miscellaneous surfaces shall consist of replacing or restoring in-kind of any surface damaged or disturbed by the work, including, but not limited to, grass, landscaping of any kind, gravel, oiled dirt, concrete, or soil.

The surfaces of all trenches, excavations or other areas damaged or disturbed by the work, upon completion of miscellaneous surface restoration, shall conform to the elevations and character of the areas which existed before work commenced. Excess trench or excavation material shall not be spread over any part of the project site, unless authorized by the Engineer, and shall be disposed of in accordance with Section 7-1.13 of the State of California Standard Specifications.

15.05 MEASUREMENT AND PAYMENT

Pavement replacement will be paid for at the price bid per lineal foot or per square foot, as specified in the Special Provisions, and shall include full compensation for furnishing all labor, materials, tools and equipment, and doing all the work, including saw cutting or trimming of edges, involved in replacing pavement in place as specified in these Standard Specifications and the Special Provisions, and as directed by the Engineer.

Temporary pavement replacement and miscellaneous surface restoration shall be included in the various bid items of work, with no additional payment made therefore unless otherwise specified in the Special Provisions.

SECTION 16 - CONCRETE IMPROVEMENTS

16.01 DESCRIPTION

Concrete improvements shall consist of the construction of Portland cement concrete curb, gutters, sidewalks, driveway approaches, handicap ramps, valley gutters, and mowstrips in place and complete in accordance with these Standard Specifications, the Engineering Improvement Standards, and Sections 52 and 73 of the State of California Standard Specifications.

16.02 PORTLAND CEMENT CONCRETE

Portland cement concrete shall be Class 3 (five sack) concrete that meets the requirements of Section 10 of these Standard Specifications.

16.03 REINFORCEMENT

Reinforcement bar shall conform to the provisions of Section 52 of the State of California Standard Specifications.

16.04 SUBGRADE PREPARATION

The subgrade beneath concrete improvements shall be prepared true to grade and cross-section. It shall be compacted to a minimum of ninety-five percent (95%) relative compaction to a depth of six inches (6") beneath curbs and gutters, valley gutters, median and landscape curbs, and commercial driveway approaches. Sidewalks, ramps and single family residential drive approaches shall be compacted to a minimum of ninety-five percent (95%) relative compaction to a depth of six inches (6"). Relative compaction shall be determined by Test Method No. California 216.

All soft and spongy material shall be removed to a depth of not less than six inches (6") below subgrade elevation for all concrete improvements except sidewalks and three inches (3") below for sidewalks, and the resulting space filled with earth, sand or gravel then compacted to form a firm and solid foundation. The forms and subgrade shall be wet immediately prior to placing concrete.

Compaction testing shall be provided as specified in Section 6.02 of these Standard Specifications.

16.05 DRIVEWAY AND ALLEY APPROACHES, MOWSTRIPS, EXISTING CURBS, GUTTERS, VALLEY GUTTERS AND SIDEWALKS

Where the approved Construction Drawings provide for the reconstruction of a portion of an existing curb, gutter, valley gutter, sidewalk or mowstrips, the existing section shall be cut to a minimum depth of one and one half inches (1½") with an abrasive type saw at the line shown in the approved Construction Drawings or as determined by the Engineer, and the entire section to be reconstructed shall be removed. Saw cuts shall also be of sufficient depth to leave an even, straight line. The new curb, gutter, valley gutter, sidewalk or mowstrip shall

join the original at this line with a two inch by two inch (2" x 2") shovel footing under the existing concrete structure or doweled as directed by the City Engineer. Full compensation for the removal and disposal of existing concrete improvements shall be included in price bid for the various items of work requiring the removal or as specified in the Special Provisions.

16.06 STAMPED MEDIAN

a. Base prep: Two inch (2") minimum sand base over compacted subsoil. Sand base should be moist prior to concrete placement.

b. Concrete mix & placement: Concrete mix should be five (5) sack, two thousand five hundred pounds per square inch (2,500 psi) minimum with large aggregate mixes (¾ inch minimum) or six (6) sack if pea gravel mix used. Concrete should be placed at four inch (4") slump. Placement of concrete should be flush or slightly higher than adjacent curbs with a 2% crown to the center of the median. All curbs and street paving should be protected with two mill plastic to protect staining.

   Concrete should be colored by use of QC PRODUCT COLOR HARDNER-BRICK RED D.P. This color can be substituted with DAVIS PRODUCT-BRICK RED INTEGRAL COLORING at four pounds (4 lbs) per sack of cement with City of Visalia's Engineering approval.

   Broadcast color hardener shortly after bleed water dissipates from surface. Float color into surface by means of wood float. A second pass of color should be broadcast and floated shortly after first. A third pass of color maybe required if surface is not completely covered in red color.

   Liquid release solvent agent shall be applied evenly to the troweled surface just prior to imprinting. A powder release agent will not be accepted.

   BASKET WEAVE USED BRICK PATTERN shall be used to imprint plastic surface timed to leave a consistent pattern across surface.

   Cure and seal, or approved equal, shall be applied in accordance with the manufacture's recommendations immediately after completing the imprinting process.

   Jointing of fresh concrete should be every eight feet to ten feet (8'-10') by lightly scoring a grout line approx three-fourths of one inch (¾") deep soon after imprinting concrete by us of a CUT BAR. This can also be accomplished by us of an EARLY ENTRY CONCRETE SAW soon after concrete hardens enough to not leave tracking.

   Cut plastic along curb line and roll up residual powders and discard. All coloring agents and powders must be controlled to protect City's storm drain systems.

c. Utility boxes: All utilities boxes should be protect during concrete placement and flush with surface. Concrete edges should be edged and flush around boxes.

16.07 CONCRETE BLOCK WALL

a. Webs of each course shall center on webs below. Vertical cells shall have vertical alignment to maintain a clean unobstructed vertical flue measuring not less than three inches by three inches (3"x 3").

b. All bolts and anchors shall be set in grout one inch (1") minimum between bolts and masonry all around. See typical details for typical anchor bolt in masonry detail.

c. Footing dowels shall be provided at all points where cells are to be reinforced.

d. Reinforcing shall be straight and placed accurately in position. Vertical bars in cells shall be held in place by an approved mechanical device at top and bottom and at intervals not to exceed 192 bar diameters apart.

e. Where grouting is stopped for a period of one (1) hour or longer, horizontal construction joints shall be formed by stopping the grout pour one and one half inches (1½") below the top of the upper most unit.

f. Splices in reinforcing steel, unless otherwise specifically shown, shall be as follows:

   i. Horizontal bars at corners and ends ..... 40 diam. or 24" min.

   ii. Horizontal bars at all other locations ..... 64 diam.

   iii. Vertical bars at end of walls ..... 64 diam.

   iv. Intermediate vertical wall bars ..... 50 diam.

   v. Column bars ..... 50 diam.

g. Where the block is laid to a maximum of four feet (4') before grouting, no cleanouts shall be required. Where the block is laid to heights greater than four feet (4') before grouting, cleanouts shall be provided at the bottom of all cells. Cleanouts shall be a minimum of two inches by three inches (2" x 3").

h. The ends and corners of all walls shall have 1-#6 minimum vertical bar unless noted otherwise.

i. Cement grout shall consist of one (1) part portland cement, three (3) parts of sand, and no more than two (2) parts of three-eighths of one inch (⅜") pea gravel.

j. Cement mortar shall consist of one (1) part portland cement, two and one-fourth to three (2¼ - 3) parts of sand, and one-fourth to one-half (¼ - ½) part hydrated-lime or lime putty.

k. Grout shall have a minimum ultimate compressive strength of two thousand pound per square inch (2000 psi) at twenty-eight (28) days.

l. Ultimate compressive strength of prism units shall be a minimum of one thousand five hundred pounds per square inch (1500 psi) at twenty-eight (28) days.

m. Mortar shall have a minimum ultimate compressive strength of one thousand five hundred pounds per square inch (1500 psi) at twenty-eight (28) days.

n. At all wall piers less than five (5) times the wall thickness, horizontal steel reinforcing shall be changed to no. 3 ties at eight inches (8") on center hooked around jamb bars.

o. No vertical pipes or conduits greater than three-fourths of one inch (¾") in diameter shall be permitted in concrete masonry unit (cmu) wall. Conduit placement shall not dislocate any reinforcement. No reinforcing shall be cut to place pipes or conduit in wall without written approval of Engineer.

p. Concrete blocks shall conform to the requirements of ASTM C90-Grade N Type I Specification for hollow load bearing light weight concrete masonry units.

q. The Contractor shall obtain and provide the building official and the Engineer with a "Letter of Certification" that the concrete masonry units comply with compressive strength required in UBC Table 24-C prior to delivery of the units to the site or starting any masonry work.

r. The Contractor shall obtain and provide the building official and the Engineer with a "Letter of Certification" that the grout complies with a minimum two thousand pounds per square inch (2000 psi) compressive strength as required by UBC Table 24- C Footnote 4.

16.08 FORMS

Forms shall be of the quality and set in place as specified in Section 10.07 of these Standard Specifications and in Section 73-1.04 of the State of California Standard Specifications.

16.09 WEAKENED PLANE JOINTS

Weakened plane joints shall be placed and spaced at sixteen foot (16') centers or as shown in the Engineering Improvement Standards for the item of work. Weakened joints shall be a minimum of one inch (1") in depth in sidewalks and ramps and shall be finished with a one-fourth of one inch (¼") maximum radius edger. Weakened joints in curbs, gutters and drive approaches shall be a minimum of one and one half inches (1½") in depth and shall be finished with a one-fourth of one inch (¼") maximum radius edger.

16.10 IMPROVEMENTS; CONSTRUCTION OF CONCRETE IMPROVEMENTS

Curbs, gutters, sidewalks, driveway and alley approaches, valley gutters and mowstrips shall conform to Section 73 of the State of California Standard Specifications, the Engineering Improvement Standards, and these Standard Specifications.

Extruded curb and gutter shall be constructed with Class 3 concrete.

All concrete work shall be finished with a steel trowel and given a brush finish.

16.11 CURING

The concrete shall be cured in accordance with Section 10.08 of these Standard Specifications. When maximum daytime temperature exceeds fifty degrees Fahrenheit (50º F) all newly placed concrete shall be sprayed uniformly with a curing compound. Curing compound shall be applied at a nominal rate of one gallon per one hundred fifty square feet (1 gal/150 ft²), unless otherwise specified.

16.12 ROCK POCKETS

Immediately upon stripping curb forms and prior to backfill, all rock pockets or honeycombs shall be repaired to the satisfaction of the Engineer.

16.13 BACKFILLING

After removal of forms, the area behind the sidewalk shall be cleaned of all surplus concrete and other debris and the area filled with clean earth suitable for planting. If the excavation for gutter has been made in a bituminous surfaced street, the space occupied for forms shall be backfilled with freshly prepared bituminous surfacing material thoroughly tamped into place and leveled off to meet the existing street surface.

16.14 MEASUREMENT

The length of concrete curbs, gutters and mowstrips to be paid for shall be the length in feet designated by the Engineer. The area of concrete sidewalk, driveway and alley approach, and valley gutter to be paid for shall be the area in square feet designated by the Engineer.

16.15 PAYMENT

The price paid per linear foot of concrete curb, gutter, valley gutters in alleys, or mowstrips and the price paid per square foot of concrete sidewalk, driveway, alley approach, and valley gutter shall include full compensation for furnishing all labor, material, tools and equipment and doing all the work involved in constructing concrete curbs, gutters, mowstrips, valley gutters and sidewalks, including curing, all as shown in the approved Construction Drawings, as specified in these Standard Specifications and in the Special Provisions, and as directed by the Engineer.

SECTION 17 - SEWER AND STORM DRAIN PIPE

17.01 DESCRIPTION

This work shall consist of furnishing and installing sewer and storm drain pipe as shown in the approved Construction Drawings, as directed by the Engineer, and as specified in these Standard Specifications.

All precast pipe shall be of the size and class shown in the approved Construction Drawings or specified in the Special Provisions. The pipe class, as designated in the approved Construction Drawings, has been determined for vertical load under average trench conditions. The Contractor shall exercise precautionary measures against trench cave-ins by providing adequate shoring or other devices to minimize the development of adverse trench conditions. Should the trench condition exceed in width the average trench condition, the Contractor shall provide a recognized special bedding, approved by the Engineer, which is adequate to maintain pipe strength equivalent to the average trench condition. No additional compensation will be paid for such special bedding. In lieu of special bedding and the class of pipe designated in the approved Construction Drawings, the Contractor may provide a class of pipe in accordance with the manufacturer's recommendation for the conditions under which the pipe is placed, with no additional payment therefore.

17.02 TYPES OF PIPE

a. Storm Drain Pipe: Where "storm drain pipe" is specified in the approved Construction Drawings, the Contractor will be allowed to install either reinforced concrete pipe, non-reinforced concrete pipe, or polyvinyl chloride pipe (PVC) conforming to these Standard Specifications except where a particular type of pipe is specified in the approved Construction Drawings or in the Special Provisions. Where a particular type of pipe is specified in the approved Construction Drawings or in the Special Provisions, only that type of pipe shall be installed and no substitution will be allowed except as specified in Section 17.05 of these Standard Specifications. Once pipe laying operations have begun, the Contractor will not be allowed to switch to a type of pipe different from that laid without prior approval from the Engineer.

   Rubber gasketed concrete pipe conforming to these Standard Specifications shall be installed if "rubber gasketed storm drain pipe" is specified in the approved Construction Drawings. Where a particular type of pipe is specified in the approved Construction Drawings or in the Special Provisions, only that type of pipe shall be installed and no substitution will be allowed except as specified in Section 17.05 of these Standard Specifications.

   The strength of pipe to be installed shall be specified in the approved Construction Drawings as either Class II (Cl II), Class III (Cl III), Class IV (Cl IV) or Class V (Cl V). These strength classifications are based on the D-Load to produce the ultimate load in the 3-edge bearing strength test, ASTM Designation: Test Method C497 or C500. The following table shall be used to determine the strength class of pipe to be installed by the Contractor to meet the class specified in the approved Construction Drawings:

Pipe Class on Drawings	CL II	CL III	CL IV	CL V
Reinforced Concrete Pipe	CL II	CL III	CL IV	CL V
(C76)	1500D	2000D	3000D	3750D
Nonreinforced Concrete Pipe	E.S.	E.S.	N/A	N/A
(C14)	1500D	2000D	3	000D

*E.S. = Extra Strength
*N/A = Not Available

The Contractor's attention is called to Section 17.01 of these Standard Specifications in regards to strength requirements specified in the approved Construction Drawings.

b. Sewer Pipe: Where "sewer pipe" is specified in the approved Construction Drawings, the Contractor will be allowed to install either vitrified clay pipe, or poly vinyl chloride (PVC) pipe conforming to these Standard Specifications except that once pipe laying operations have begun, the Contractor will not be allowed to switch to a type of pipe different from that being laid without prior permission from the Engineer. The final determination as to the suitability of any pipe for use as sewer pipe shall be made by the City Engineer.

Sewer pipe shall be designed such that the slope of the proposed line will create a velocity of two feet per second (2 ft/sec) when the pipe is flowing half full using a Manning's "N" of eleven thousandths (0.011).

Minimum Acceptable Slopes For Sewer Pipe

Pipe Diameter (inches)	Slope at 2 F.P.S. Velocity (percent) (for vitrified clay pipe)
6	0.35
8	0.24
10	0.18
12	0.14

Once pipe laying operations have begun, the Contractor will not be allowed to switch to a type of pipe different from that being laid without prior permission from the Engineer. The final determination as to the suitability of any pipe for use as sewer pipe shall be made by the City Engineer. Where a particular type of pipe is specified in the approved Construction Drawings or in the Special Provisions, only that type of pipe shall be installed and no substitution will be allowed without permission from the City Engineer.

17.03 HIGH DENSITY POLYETHYLENE PIPE (HDPE)

All HDPE for sanitary sewers shall be Class 63. Pipe material shall meet the requirements of Type III. Class C, Category 5, Grade P34 as defined in ASTM D1248 Standard Specification for polyethylene plastics molding and extrusion materials.

Gaskets shall meet the requirements of ASTM F477 and be molded into a circular form or extruded to the proper section and then spliced into circular form and shall be made of a properly curbed high grade elastomer compound. The basic polymer shall be natural rubber, synthetic elastomer or a blend of both. The lubricant used for assembly of gasket joints shall have no detrimental effect on the gasket or on the pipe.

The Contractor shall have the manufacturer furnish a "Certificate of Conformance" to these Standard Specifications.

Upon completion of backfill and compacting trenches, the Contractor, at his expense, shall pull a properly sized mandrel through the installed main line to demonstrate the maximum pipe deflection does not exceed five percent (5%). If excessive pipe deflection obstructs passage of the mandrel, the Contractor shall excavate and make suitable repairs to the Engineer's satisfaction.

17.04 POLYVINYL CHLORIDE (PVC) LARGE DIAMETER RIBBED PIPE

Large diameter ribbed pipe and fittings materials shall meet and/or exceed all of the requirements of ASTM F794 Specification.

Minimum pipe stiffness (F/y) at five percent (5%) deflection shall be forty-six (46) for all sizes when tested in accordance with ASTM method D2412.

Special care shall be taken in the installation of PVC pipe so that no more than five percent (5%) deflection occurs in the pipe. The bottom of trench shall be formed such that the pipe can be placed with uniform support along its length.

The first lift of backfill shall be placed by hand and shall extend only to the pipe springline and hand tamped; the second lift of backfill shall extend to six inches (6") above the top of the pipe and hand tamped only on the sides of the pipe.

Documentary evidence of test results will be considered sufficient when pipe manufacturer furnishes a certificate indicating that the pipe has been subjected to and passed hydrostatic, load, and chemical resistance tests conducted in accordance with approved methods.

Upon completion of backfill and compacting trenches, the Contractor, at his expense, shall pull a properly sized mandrel through the installed main line to demonstrate the maximum pipe deflection does not exceed five percent (5%). If excessive pipe deflection obstructs passage of the mandrel, the Contractor shall excavate and make suitable repairs to the Engineer's satisfaction.

17.05 POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS

a. Materials: Poly vinyl chloride (PVC) pipe and fittings shall be manufactured in accordance with ASTM Designation: D3034 – 73.

   The minimum allowable pipe stiffness (F/AY) for all sizes shall be forty-six pounds per square inch (46 psi) at five percent (5%) deflection when tested in

accordance with ASTM Test Method D2412. Pipe and fittings shall be manufactured and supplied with bell and spigot joints which are an integral part of the pipe or fitting.

Upon demand, the manufacturer of PVC pipe shall furnish to the Engineer a "Certificate of Compliance" in accordance with the provisions of Section 6.03 of these Standard Specifications. External loading properties of plastic pipe by parallel-plate loading, and shall conform to the following dimensions and tolerances, as in accordance with ASTM designation D3034-73:

Inside Diameter Inches	Minimum Wall Thickness Inches	Average O.D.
4	0.125	4.215
6	0.180	6.275
8	0.240	8.400
10	0.300	10.500
12	0.360	12.500
15	0.437	15.300

For pipe larger than fifteen inches (15") in diameter, the Contractor shall submit to the City Engineer the specification for the pipe for approval.

Special care shall be taken in the installation of PVC Pipe so that no more than five percent (5%) deflection occurs in the pipe. The bottom of trench shall be formed such that the pipe can be placed with uniform support along its length.

Documentary evidence of test results will be considered sufficient when pipe manufacturer furnishes a certificate indicating that the pipe has been subjected to and passed hydrostatic, load, and chemical resistance tests conducted in accordance with approved methods.

Upon completion of backfill and compacting trenches, Contractor, at his expense, shall pull a properly sized mandrel through the installed main line to demonstrate the maximum pipe deflection does not exceed five percent (5%). If excessive pipe deflection obstructs passage of the mandrel, the Contractor shall excavate and make suitable repairs to the Engineer's satisfaction

b. Joints: Joints for PVC pipe and fittings shall be elastomeric gasket type able to withstand contraction and expansion and be able to prevent displacement during assembly after the pipe has been locked into place. Joints shall be water tight when tested in accordance with ASTM Test Method D2855.

Joints shall be of such a design that when the pipe is properly laid, there shall be a smooth and uniform interior surface. Ends of pipe sections and fittings shall be free of cracks and broken edges. Pipe found to be so damaged shall be rejected for use in the work.

The ends of the pipe shall be thoroughly cleaned immediately prior to joining sections of pipe. Pipe shall then be joined together as recommended by the manufacturer. Gaskets shall be properly lubricated and the pipe "homed" as far as

recommended. No appreciably gap shall exist at the completed joint, except as permitted by the Engineer. Excess gaps in any case shall be cause for rejection of the work, and corrective measures shall be taken when ordered by the Engineer.

c. Pipe Laying: Pipes shall be laid in conformity with the prescribed lines and grades obtained from stakes set by the Engineer. The pipe shall be laid uphill from structure to structure with the bell (or groove) end up-grade. Occasional variations in grade will be permitted as follows: Above grade, one-fourth of one inch (¼"), below grade, not to exceed one-half of one inch (½"); alignment, not to exceed three inches (3") or uniform deflection in a distance of twenty feet (20'). Adjustments of pipes to line and grade shall be made under the body of the pipe throughout its entire length and not by blocking or wedging. Bell holes shall be accurately placed and shall not be larger than is reasonably required to make the joint. Before the pipe is laid, the interior of the bell of the preceding pipe shall be carefully cleaned. After each section of pipe has been laid to line and grade, it shall be joined to the preceding section as required in Section 17.06.b, "Joints" of these Standard Specifications. After jointing procedure has commenced, there shall be no movement of the pipe whatsoever in subsequent operations. Material shall be placed uniformly on either side of the pipe to prevent any movement, in accordance with Section 12.06 of these Standard Specifications. No walking in the trench or working over the pipe after it has been laid, except as may be necessary in tamping the earth and refilling, will be permitted until the pipe has been braced as specified above. The open ends of all sewer lines being installed shall be covered to keep out animal life, etc., whenever the line is left unattended for any length of time, such as overnight.

d. Bedding: Bedding for PVC pipe shall conform to the requirements of ASTM Designation: D2321, for the type and class of material encountered in the trench. These Standard Specifications shall take precedence over other bedding requirements specified in those Specifications, but not exclude them.

e. Backfill: The first lift of backfill shall be placed by hand and shall extend only to the pipe springline and hand tamped; the second lift of backfill shall extend to six inches (6") above the top of the pipe and hand tamped only on the sides of the pipe. This backfill shall be performed as specified in Section 12.06 of these Standard Specifications except that the initial backfill operation shall conform to the requirements of the "Haunching and Initial Backfill" section of ASTM Designation: D2321.

f. Deflection Test: Deflection testing shall be provided by the Contractor for all PVC installations. The Contractor shall demonstrate that the maximum pipe deflection does not exceed five percent (5%) of the diameter of the pipe installed by pulling a properly sized solid ball or mandrel or a rigid set of discs, as approved by the Engineer, through the pipe.

Where deflection of the pipe exceeds the allowable, the Contractor shall, at his own expense, make suitable repairs to the line before it is offered for retesting and acceptance. All repairs shall be made to the satisfaction of the Engineer. Deflection testing shall be paid for at the unit price bid per linear foot of pipe when the items

of work are included in the bid proposal. When no item of work is included in the bid proposal, payment for the testing shall be considered to be included in the price bid for the various items of work requiring the testing and no additional payment will be made therefore. Full compensation for providing deflection testing, including furnishing all labor, materials, tools, equipment, and incidentals, and doing all work involved in performing the required testing shall be included in the unit price bid per linear foot for deflection testing or included in the various items of work requiring the testing and no additional payment will be made therefore.

17.06 REINFORCED CONCRETE PIPE

a. Materials: Reinforced concrete pipe shall be manufactured in accordance with ASTM Designation: C76, as amended or revised. When used as a sanitary sewer application this pipe shall be PVC lined.

Upon demand, the manufacturer of pre-cast concrete pipe shall furnish to the Engineer a "Certificate of Compliance" in accordance with the provisions in Section 6.03 of these Standard Specifications.

The cement used in manufacture shall be Type II, as per ASTM C150. Unless otherwise noted in the approved Construction Drawings, provide Class III pipe fpr all pipe buried ten feet (10') or less, Class IV for pipe buried eleven feet to fifteen feet (11'-15'), and Class V pipe buried greater than sixteen feet (16'). All pipe approved will have an interior surface which is free from roughness, projections, indentations, offsets or irregularities of any kind. Pipe type could vary dependent upon "D" loads. Engineer to specify and provide verification.

b. Pipe Lengths: Furnish pipe in standard lengths. Shorter lengths may be used where required by construction details or when approved by the City.

c. Repairs: Pipe may be repaired, if necessary, because of occasional minor imperfections in manufacture or accidental injury during handling and will be acceptable if, in the opinion of the City, the repairs are sound, properly finished and cured, and the repaired pipe conforms to the requirements of ASTM C76. Use mortar for repairs which has a compressive strength of six thousand (6,000) psi at the end of twenty-eight (28) days.

d. Marking: Mark all pipe in accordance with ASTM C76; no pipe will be accepted unless these markings appear on all pipe.

e. Joints: The ends of reinforced concrete pipe sections shall be of such design that when properly laid they shall have a smooth and uniform interior surface. Both ends of pipe sections shall be substantially free of cracks and broken edges. Pipe so found to be damaged shall be rejected for use in the work. Each joint shall be sealed to prevent leakage. Sealing of joints shall be accomplished with rubber gaskets, as indicated in the approved Construction Drawings or specified in the Special Provisions, and shall conform to the following specifications:

i. Rubber Gasketed Joints: Rubber gasketed joints shall conform to the

requirements of ASTM Designation: C443 and shall be flexible and able to withstand expansion, contraction and settlement.

The ends of the pipe shall be thoroughly cleaned immediately prior to joining sections of pipe. The two (2) sections joined shall be firmly placed together in such a manner that the tongue or gasket end of the pipe "homes" on the bell end of the pipe. No appreciable gap shall exist at the completed joint, except as permitted by the Engineer at locations where curves in the pipe alignment are specified or required. Excessive gaps in any case shall be cause for rejection of the work, and corrective measures shall be taken when ordered by the Engineer.

ii. Construction Joints: Whenever two (2) sections of pipe are to be joined where standard joints are not available, such as joining reinforced concrete pipe to cast-in-place or asbestos cement pipe, a concrete collar shall be constructed around the full periphery of the pipe and extending one foot (1') each side of the joint. The collar shall be of a minimum thickness equal to that of the concrete pipe, but in no case less than four inches (4") thick. The interior of the joint shall be smoothed with cement mortar and brushed. The area to receive the collar shall be thoroughly cleaned and dampened immediately prior to construction of the collar. The cost of constructing concrete collars shall be considered as included in the cost of the items requiring the collar, and no additional payment will be made therefore.

f. Pipe Laying: Pipes shall be laid in conformity with the prescribed lines and grades obtained from stakes set by the Engineer. The pipe shall be laid uphill from structure-to-structure with the bell (or groove) end up-grade. Pipe with elliptical reinforcement shall be placed with the minor axis in a vertical position. Adjustments of pipes to line and grade shall be made under the body of the pipe throughout its entire length and not by blocking or wedging. Bell holes shall be accurately placed and shall not be larger than is reasonably required to make the joint. Before the pipe is laid, the interior of the bell of the preceding pipe shall be carefully cleaned. After each section of pipe has been laid to line and grade, it shall be joined to the preceding section as required in Section 17.07.e, "Joints" of these Standard Specifications. After jointing procedure has commenced, there shall be no movement of the pipe whatsoever in subsequent operations. Material shall be placed uniformly on either side of the pipe to prevent any movement, in accordance with Section 12.06 of these Standard Specifications. For mortar joint pipe, no walking in the trench or working over the pipe after it has been laid, except as may be necessary in tamping the earth and refilling, will be permitted until the pipe has been braced as specified above.

17.07 CAST-IN-PLACE CONCRETE PIPE

a. Materials: Concrete used in the construction of non-reinforced cast-in-place concrete pipe and cement mortar used for patching, smoothing or repair of cast-in-place concrete pipe shall conform to the requirements of Section 10 "Portland Cement Concrete, Cement Mortar" of these Standard Specifications.

Concrete shall be either Class "A" (six sack mix), or Class "B" (five sack mix), and shall develop a minimum compressive strength of two thousand eight hundred pounds per square inch (2,800 psi) at twenty-eight (28) days.

Admixtures shall be used only in conformity with the requirements of Section 10.04 of these Standard Specifications.

Coarse and fine aggregate gradation shall conform to the requirements of Section 10.02 "Materials" of these Standard Specifications and these coarse aggregate maximum size limitations:

Pipe Diameter	Maximum Aggregate Size
24" to 48"	1" maximum
48" and over	1 ½" maximum

Coarse and fine aggregate shall also conform to ASTM Designation: C-33-57 as revised.

Reinforced concrete pipe may be substituted for cast-in-place concrete pipe at any location and shall comply with the following provisions:

i. Reinforced concrete pipe shall conform to the requirements of Section 17.04 of these Standard Specifications.

ii. Substituted pipe shall have the same internal diameter as specified for cast-in-place pipe. The pipe class shall be as specified or as determined by the Engineer.

iii. Joints on substituted pipe shall be of the cement mortar type unless otherwise indicated in the approved Construction Drawings or in the Special Provisions.

iv. Payment shall be at the unit price bid for cast-in-place concrete pipe with no additional compensation paid therefore, except as provided in this Section.

b. Nominal Internal Diameter: The nominal internal diameter shall be the size indicated in the approved Construction Drawings. The actual internal diameter of the pipe at any point shall not be more than five percent (5%) less than the nominal internal diameter, and the actual internal cross-sectional area of the pipe at any point shall not be less than the cross-sectional area of a circle computed from the nominal internal diameter. The Contractor may be allowed to construct pipe of larger sizes than that specified in the approved Construction Drawings; however, any and all deviations in sizes from that specified must be approved by the Engineer.

c. Wall Thickness: Minimum wall thickness for the various sizes of pipe shall conform to the following table:

Internal Diameter	Minimum Wall Thickness of Pipe
24”	3”
30”	3”
33”- 36”	3½”
42”	4”
48”	5”
54”	5½”
60”	6”
66”	6½”
72”	7”
78”	7½”
84”	8”
90”	8½”
96”	9”

d. Excavation: Excavation shall conform to the requirements of Section 12.05, “Trench and Structure Excavation” of these Standard Specifications.

e. Bedding: Bedding shall conform to the requirements of Sections 12.05 and 17.13 of these Standard Specifications, unless otherwise specified in the Special Provisions.

f. Pipe Construction (Feasibility): The City makes no guarantee as to the types of soil or of soil conditions within the project limits. The Contractor shall perform whatever soils or other tests as he deems necessary to make himself fully aware, prior to submitting a bid proposal, of the soil types or conditions which may prevail throughout the project site. Tests so performed shall be conducted at the Contractor’s expense, and no compensation will be paid therefore.

Where unstable trench conditions are encountered, the Contractor shall attempt to stabilized the trench by shoring or, wherever practical, by sloping the sides of the trench above the top of the pipe.

Where the Engineer determines, due to unstable trench conditions or other reasons, that it is not feasible to place cast-in-place concrete pipe, the Contractor shall place reinforced concrete pipe of the same size and class indicated in the approved Construction Drawings or Bidder’s proposal, or a specified in the Special Provisions. The Contractor will be paid for reinforced concrete pipe so placed at the unit price bid for cast-in-place pipe and no additional compensation paid therefore.

Construction of cast-in-place concrete pipe may be considered as not feasible when the trench walls are not stable below a distance above the bottom of the trench equal to one-half the diameter of the pipe. The Engineer, however, shall be the sole judge as to the feasibility of constructing cast-in-place concrete pipe as shown in the approved Construction Drawings. Construction of cast-in-place concrete pipe shall be considered as feasible where fifty feet (50’) or more of stable trench is encountered.

g. Pipe Construction: Pipes shall be constructed in conformity with the prescribed lines and grades obtained from stakes set by the Engineer.

All surfaces against which concrete is to be placed shall be free from standing water, mud and debris and shall be firm enough to prevent contamination of the concrete by earth or other foreign material.

Absorptive surfaces against which concrete is to be placed shall be moistened thoroughly so that the moisture will not be drawn from the freshly placed concrete.

When placing operations cease or are delayed for any reason for more than thirty (30) minutes, the end of the pipe shall be left rough with a slope of approximately thirty degrees (30º) and the ends of the pipe shall be securely closed by heavy canvas or other acceptable material to prevent excessive dehydration of the concrete already placed. The joint so formed when placing operations again commence shall conform to the requirements of Section 17.05b of these Standard Specifications.

Cast-in-place pipe shall be constructed in one placement around the complete periphery of the pipe by means of a traveling pipe-casting-machine approved by the Engineer. The Bidder may be required to furnish evidence of successful in-service performance of pipe produced by the pipe-casting-machine under similar working conditions.

Pipe shall be cast-in-place in a manner such that as forms are lapped, the lap ridges formed in the interior walls of the pipe face downstream in the direction of flow.

Forms used in the work shall be clean and reasonably free of concrete adhering to the surface of the forms from previous operations. Immediately prior to use in the work, work, each form shall be sprayed or otherwise coated with an approved form oil. Forms used shall be of sufficient strength to withstand vibrating of concrete and which will provide interior dimensions of the pipe in accordance with the tolerances of Section 17.05 of these Standard Specifications. Damaged forms shall not be used in the work and shall be removed from the job site.

h. Construction Joints: Where construction of cast-in-place concrete pipe stops short of a manhole or other structure and construction will continue at a later time, or where cast-in-place pipe is to be jointed to pre-cast pipe, the resulting joint shall be reinforced by constructing a concrete collar around the joint. This collar shall extend one foot (1') each side of the joint around the full periphery of the pipe, and shall be equal in thickness to the wall thickness of the joined pipe, but in no case less than four inches (4"). The area to receive the collar shall be thoroughly cleaned and dampened immediately prior to constructing the collar. The cost of constructing concrete collars shall be considered as included in the cost of the various items requiring construction of concrete collars, and no additional payment will be made therefore.

i. Curing: Immediately after finishing of the exposed exterior surface of the pipe, it shall be covered with an approved polyethylene or plastic membrane which shall be anchored sufficiently to keep the surface covered.

Unless the pipe terminates at a structure which is closed to the air, the ends of the pipe, as well as any other openings, shall be securely closed with an impermeable membrane for a minimum of seven (7) days or until the structure is constructed, if sooner. Precaution shall be used to make the structure reasonably air-tight for a minimum of seven (7) days, except when work is taking place inside the pipe.

j. Finish: The exterior exposed surface of the pipe shall have a steel screeded finish. A hand trowel shall be used, as construction progresses, to smooth areas not sufficiently smoothed by the pipe-casting machine. All finishing of the exterior shall be accomplished immediately as pipe construction progresses.

The interior surface of the pipe shall be equivalent to a steel screeded finish. All honey-combed or minor voids shall be chipped out, filled and smoothed with cement mortar. Major voids shall be repaired with Portland Cement Concrete (Class 2 or 3) in a manner prescribed by the Engineer.

Excessive longitudinal ridges along the sides of the interior of the pipe shall be chipped back and smoothed with cement mortar as directed by the Engineer. Form lap offsets exceeding the limits established below shall be chipped back and smoother with mortar.

Pipe Diameter	Maximum Offset
24” - 30”	3/8”
33” - 42”	1/2”
48” - 66”	5/8”
72” - 90”	7/8”
96” – larger	1”

Interior finishing shall be accomplished as soon as possible or practical after placing of the pipe and shall be subject to the provisions of Section 17.17, “Payment” of these Standard Specifications.

k. Concrete Tests: During the placing operations, the Contractor, if requested, shall assist the Engineer in securing three (3) standard test cylinders for each fifty (50) cubic yards, or portions thereof, per day. Test cylinders shall be tested for strength by a recognized testing laboratory. The cost of such tests will be at the Contractor’s expense and certified copies of the results will be submitted to both the Contractor and the Engineer. One (1) of the cylinders will be tested at the end of seven (7) days; one (1) of the test cylinders will be tested at the end of twenty-eight (28) days; and one (1) of the test cylinders will be held to be tested at the discretion of the Engineer, all in accordance with the procedures established by the ASTM Designation: C39.

l. Hydrostatic Tests: When hydrostatic testing is specified and when the concrete has reached a compressive strength of two thousand eight hundred pounds per square inch (2,800 psi), the Contractor shall test the pipe with water to the maximum operating head. The line may be tested in one length or in sections, as approved by the Engineer. Each test shall be maintained for twenty-four (24) hours at the maximum operating head.

All leaks creating wet spots at the soil surface, or otherwise exposed by the test, shall be repaired by and at the expense of the Contractor. Leakage loss during this test period shall not exceed one thousand gallons (1,000 gal) per inside diameter inch per mile of pipe installed, for a period of twenty-four (24) hours.

Where leakage exceeds the allowable, the Contractor shall discover the cause and remedy it before the line is offered for retesting and acceptance. If the leakage is less than the allowable, and individual leaks are observed, such leaks shall be repaired in a manner satisfactory to the Engineer.

17.08 VITRIFIED CLAY PIPE AND FITTINGS

a. Materials: Vitrified clay pipe and fittings shall be extra strength bell and spigot pipe manufactured in accordance with ASTM Designation: C200.

Upon demand, the manufacturer of vitrified clay pipe shall furnish to the Engineer a "Certificate of Compliance" in accordance with Section 6.03 of these Standard Specifications.

b. Joints: Joints shall be performed factory fabricated plastisol joints manufactured in accordance with ASTM Designation: C425.

Joints shall be of such a design that when the pipe is properly laid there shall be a smooth and uniform interior surface. Ends of pipe sections and fittings shall be free of cracks and broken edges. Pipe so found shall be rejected for use in the work.

The ends of the pipe shall be thoroughly cleaned immediately prior to joining sections of pipe. The two (2) sections joined shall be firmly placed together in such a manner that the spigot end of the pipe "homes" on the bell end of the pipe. No appreciable gap shall exist at the completed joint, except as permitted by the Engineer at locations where curves in the pipe alignment are specified or required. Excessive gaps in any case shall be cause for rejection of the work, and corrective measures shall be taken when ordered by the Engineer.

c. Pipe Laying: Pipes shall be laid in conformity with the prescribed lines and grades obtained from stakes set by the Engineer. The pipe shall be laid uphill from structure to structure. Occasional variations in grade will be permitted as follows: Above grade one-quarter inch (¼"); below grade not to exceed one-half inch (½"); alignment not to exceed three inches (3") if gradual over a distance of twenty feet (20'). Adjustments of pipes to line and grade shall be made under the body of the pipe throughout its entire length and not be blocking or wedging. Bell holes shall be accurately placed and shall not be larger than is reasonably required to make the joint. Before the pipe is laid, the interior of the bell of the preceding pipe shall be carefully cleaned. After each section of pipe has been laid to line and grade, it shall be joined to the preceding section as required in Section 17.09.b, "Joints" of these Standard Specifications. After jointing procedure has commenced, there shall be no movement of the pipe whatsoever in subsequent operations. Material shall be placed uniformly on either side of the pipe to prevent any movement, in accordance with Section 12.06 of these Standard Specifications. No walking in the

trench or working over the pipe after it has been laid, except as may be necessary to tamping the earth and refilling, will be permitted until the pipe has been braced as specified above. The open ends of all sewer lines being installed shall be covered to keep out animal life, etc., whenever the line is left unattended for any length of time, such as overnight.

17.09 WYES (GENERAL)

Wyes shall be of the same material as the main sewer line and be manufactured to be compatible with the pipe with which they are installed. They shall conform to the strength and jointing requirements of the Standard Specifications that covers the type of pipe with which they are to be installed.

The Contractor shall place wyes of the size specified at the locations shown in the approved Construction Drawings or as directed by the Engineer. Wyes, unless otherwise specified, shall be inclined at an angle from the horizontal of not greater than forty-five degrees (45°).

Each wye that does not terminate in a manhole shall be closed at the bell with a cap made for that purpose.

a. Payment: Payment for wyes shall be made on a unit price per each basis, or as otherwise specified in the Special Provisions, and shall include full compensation for supplying all labor, materials, tools, caps, equipment, and incidentals, and doing all work involved in furnishing and installing the wye as shown in the approved Construction Drawings and as specified in these Standard Specifications and the Special Provisions, and as directed by the Engineer, and no additional payment will be made therefore.

17.10 HOUSE BRANCHES (GENERAL)

Sewer house branches shall be installed at the locations shown in the approved Construction Drawings and in conformance with the Engineering Improvement Standards.

Four inch (4") and six inch (6") diameter branches may be connected directly to sewer mains eighteen inch (18") or greater in diameter providing that the type of connection to the main is approved by the Engineer.

House branches eight inch (8") or greater in diameter must connect to mains with a manhole structure. Installation of house branches shall commence at the bell of the wye or from the manhole and extend to a point five feet (5') inside the property line. At this point, the branch shall be plugged to seal the ends with a plug that is approved by the manufacturer of the pipe for use with his product.

a. Marking: The location where the sewer crosses beneath curb and gutter shall be marked on the curb with the letter "S". In cases where a concrete curb does not exist or will not exist in the near future, the Contractor shall mark the end of the house branch with a two inch by four inch (2" x 4") board, three feet (3') long that extends one foot (1') above the ground.

House branches shall be installed in existing streets in such a manner that the street will be open to traffic at all times.

17.11 PIPE LINE ACCEPTANCE TEST (SANITARY AND STORM)

The sewer line acceptance test shall be a low pressure air test performed under the supervision of the Engineer and utilizing the following procedure:

Test shall not be made until the section of pipe to be tested, including house branches, has been cleaned, completely backfilled and the trenches compacted as specified in Section 12.06 of these Standard Specifications.

a. Mandrel: Deflection test shall be performed as stated in Sections 17.04, 17.05 and 17.06 of these Standard Specifications.

b. Air Test: The air test is to be made on the pipe installation without the addition of seals to the pipe interior. The application of mortar, epoxy, caulking compounds, or other material to the pipe will be prohibited unless authorized by the City Engineer. Failure to meet the air test will require the Contractor to replace sections as required. Any broken pipe, separation of joints, or any pipe not laid true to line and grade, shall be replaced. All test expenses are to be borne by the Contractor.

   Plugs to be used in the test shall be the pneumatic type equipped with pressure gauges for measuring air pressure in the sewer pipe to be tested. The pressure gauges shall be calibrated in one-half of one pound per square inch (½ psi) increments and connected to the plug in such a way that when the plug is placed in the installed line, the gauge can be located outside of the manhole.

   All plugs shall be seal tested before being used in the actual test installation. The seal test shall be conducted by placing in both ends of a pipe laying on the ground, the plugs to be tested. The plugs shall then be inflated to twenty-five pounds per square inch gauge (25 psig). The sealed pipe shall then be pressurized to five pounds per square inch gauge (5 psig). The plugs shall not move when subjected to this pressure.

   Length of line tested at one time shall be limited to the length between adjacent manholes.

   Air test procedure shall be as follows: Pressure the test section to three and one-half pounds per square inch (3½ psi) and hold above three pounds per square inch (3 psi) for not less than five (5) minutes. Add air if necessary to keep pressure above three pounds per square inch (3 psi). At the end of this five (5) minute saturation period, note the pressure (must be 3.0 psi min.) and begin the timed period. If the pressure drops one-half of one pound per square inch (½ psi) in less than the time given in the following table, then the section of pipe shall not have passed the test.

Line Size	Minimum Time (Seconds)
4"	122
6"	184
8"	245
10"	306
12"	367
15"	460

For larger diameter pipe use the following formula:

Minimum Time (seconds) = 370 multiplied by pipe diameter (feet)

If the test is not passed, the leak shall be found and repaired to the satisfaction of the Engineer and the length of the repaired line retested.

The pressure gauge used shall be supplied by the Contractor, shall have minimum divisions of one tenth of one pound per square inch (0.10 psi) and shall have an accuracy of four hundredths of one pound per square inch (0.04 psi). Accuracy and calibration of the gauge shall be certified by a reliable testing firm at six (6) month intervals or when requested by the Engineer.

A physical inspection of the pipe may also be made. In such case, the Contractor shall furnish adequate blowers and ventilation equipment to allow passage of personnel through the pipe. The Contractor shall promptly repair all defects in workmanship noted in the inspections.

c. Video Inspection: The Contractor shall furnish video inspection of the newly installed storm and/or sanitary mains. The video inspection shall be made after required leakage and deflection tests have been completed and before trench resurfacing. Prior to performance of the camera inspection, the Contractor shall flush the lines with water to provide indication of high or low spots in the flowline grade. The inspection shall be recorded in true color in VHS ("SP") cassette or DVD format. The camera resolution shall be of a quality that will allow pipe joints to be inspected, imperfections in the pipe to be noted and any sag to be detected. The camera equipment shall also provide on screen footage, date, and time indication.

A written log shall accompany the recorded inspection. The following information shall be included:

i. Date
ii. Tape Number
iii. Location
iv. Pipe Material and Size
v. Name of Equipment Operator
vi. Name of Firm Performing the Inspection
vii. All deficiencies in the pipe and installation shall be noted and their location referenced to their on-screen footage readout.

The testing company shall provide a map of the tested pipe. Information provided shall clearly correlate between pipeline plans and the recorded video inspection. Lateral lines shall be documented by stationing from centerline of manholes.

Within twenty-four (24) hours of the completion of the video test a copy of the test and the log shall be delivered to the Engineer. The video test and log shall become the property of the City of Visalia.

The City shall be the sole judge as to the acceptability of construction revealed by the video inspection. Any broken, damaged, or deficient pipe, any separation or offset of joints, any pipe exceeding the tolerances for line, grade, or deflection, and any infiltration points shall be replaced or repaired at the Contractor's expense. The repair will then be re-inspected at the Contractor's expense until the repair is satisfactory.

17.12 BEDDING

Bedding for all pipe, unless specified otherwise in these Standard Specifications or the Special Provisions, shall conform to the requirements of Section 12.06 of these Standard Specifications.

17.13 BACKFILL

Backfill for all pipe, unless specified otherwise in these Standard Specifications, shall conform to the requirements of Section 12.06 of these Standard Specifications.

17.14 PROTECTION OF PIPE

The requirements of this Section 17 shall not relieve the Contractor of the provisions of Section 7.12 of these Standard Specifications.

The Contractor shall exercise every precaution against damage to the pipe, including damage from subsequent backfill or compaction operations. Any damaged pipe shall be removed from the work or repaired as directed by the Engineer.

17.15 WATER/SEWER SEPARATION

Water and sewer mains and house services shall maintain minimum vertical and horizontal separation between each other as required by Title 17 of the State of California Administrative Code, Section 7081 (b).

17.16 PAYMENT

The length of pipe to be paid for will be the slope length designated by the Engineer. When pipes are laid through structures as shown in the Engineering Improvement Standards or as directed by the Engineer, the payment quantity will include those quantities within the

structure. When pipes begin and/or terminate at structures, the payment quantity shall be exclusive of structures. When pipes enter a structure from a right angle and are cut to conform to the faces of the structure or of a slope, the quantity to be paid for will be measured along the center line of the pipe to the inside face of the structure, or to the face of the slope.

The price paid per linear foot of pipe shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, including, but not limited to, all fittings and couplings as may be required, and doing all work involved in installing the pipe complete and in place, including, but not limited to, excavation and backfill, and for all tests as herein specified, all as shown in the approved Construction Drawings, as specified in these Standard Specifications, in the Special Provisions, and as directed by the Engineer.

SECTION 18 - BORING AND JACKING PIPE

18.01 GENERAL

a. Description of Work:

This work encompasses the work required to install a casing pipe by boring and jacking.

b. Job Conditions:

i. Protection of Existing Underground Utilities:

(a) The locations of existing utilities are shown in the approved Construction Drawings based upon information and data supplied by the City or by the Owner of the utility. The utilities are shown in the approved Construction Drawings for information only and are not guaranteed to be either complete or accurate. It is the Contractor's responsibility to contact all utilities and USA to locate utilities prior to construction.

(b) Any damaged caused to existing utilities shall be reported to the appropriate utility and repaired in accordance with the utility's standards.

(c) The cost to repair/replace damaged utilities shall be borne by the Contractor.

(d) If an interruption of utility service results from accidental damage, the Contractor shall take immediate steps as necessary to notify the utility and restore service. Contractor's personnel shall not leave the site until the interruption has been restored.

ii. Work Within Railroad or Utility Right-of-Way:

(a) When the Contractor is performing work within the right of way of other jurisdictions such as railroads or utilities, such work shall comply with applicable permits or regulations of such jurisdictions.

18.02 MATERIALS

a. Casing Pipe:

i. Casing Pipe: Welded steel pipe ASTM A-139, Grade B, with minimum thirty five thousand pounds per square inch (35,000 psi) yield strength. Casing shall not be spiral welded. All casing lengths shall be equal to the auger length.

ii. Carrier Pipe: As indicated in the approved Construction Drawings.

iii. The encasing pipe shall be clean and coated on the outside with two (2) coats of coal tar epoxy: Carboline Bitumastic 300M Coal Tar Epoxy Coating or equal.

iv. Unless noted otherwise in the approved Construction Drawings, steel casing pipe shall have a minimum wall thickness as noted in the following Table. Larger casing pipe maybe substituted at no additional cost to the City.

Minimum Wall Thickness for Steel Casing Pipe for H25 and E80 Loading

	Wall Thickness, Minimum Inches	
Nominal Diameter (inches)	Under Highway (inches)	Under Railroad (inches)
12 ¾ and under	0.188	0.188
14	0.188	0.250
16	0.188	0.281
18	0.250	0.312
20 and 22	0.250	0.344
24	0.281	0.375
26	0.281	0.406
28	0.312	0.438
30	0.312	0.469
32	0.312	0.500
34	0.312	0.5312
36	0.344	0.5625

b. Spacers/Skids:

PVC casing spacers may be used for all installations.

PVC casing spacers shall be attached to the conduits with stainless steel straps to center the pipe in the casing. The spacers shall prevent appreciable movement of the conduit up or down or sideways within the casing. Spacers shall be placed every four feet (4') on center throughout the steel casing.

Redwood Skids may be used instead of spacers. Skids shall be comparable quality and functionality, spaced at four feet (4') on center.

18.03 EXECUTION

a. General:

The conduit shall be installed by jacking into place. Earth displaced by the conduit shall be removed through the interior of the conduit by hand, by auger, or by other acceptable means. Sections of the casing pipe shall be welded together with a continuous circumferential weld to form a continuous conduit capable of resisting all stresses, including jacking stresses. Any other facilities required, or any other additional reinforcement of strength of casing pipe required to withstand jacking pressures shall be determined and furnished by the Contractor at his expense. The casing pipe conduit, in its final position, shall be straight and true to alignment and grade, as required by the approved Construction Drawings.

Completed bore holes shall not exceed the outside diameter of the casing by more

than one inch (1"). When material tends to cave in from outside these limits, a shield shall be used ahead of the first section of pipe or face of excavation shall not extend beyond the end of the pipe more than one and one-half feet (1½'), unless otherwise permitted by the Engineer. All voids outside this limitation shall be completely filled by grouting or other remedial measures approved by the Engineer.

Casing pipe shall be so constructed as to prevent leakage of any substance from the casing throughout its length except at ends. Casing shall be so installed as to prevent the formation of a waterway under the roadway, with an even bearing throughout its length, and shall slope to one end. Each end of the casing shall be plugged with ungrouted bricks or other suitable material approved by the Engineer. Dry sand shall then be blown into fill the annular space between the carrier pipe and casing and an ungrouted brick plug shall be placed in the unplugged end. Plugs shall not make a tight seal.

b. Excavation:

The Contractor shall provide temporary support of pit facings as necessary to protect personnel, equipment and public. If a larger pit is required, it shall be approved by the Engineer. Guard rails and other required safety devices shall be maintained on all sides of the jacking pit as directed by the Engineer. Such guard rails shall not extend beyond the limit of the jacking operation. The jacking pit shall be considered as the immediate twenty feet (20') approaching the point where the first pipe to be jacked enters the earth.

No earth or construction materials shall be dragged or scraped across the street pavement, and no excavated earth shall be placed or allowed to remain at a location where it may be tracked on the street traveled way, or any public or private approach by the Permittee's construction equipment, or by traffic entering or leaving the street traveled way. Any excavated earth or mud so tracked onto the street pavement or public private approach shall be immediately removed by the Permittee.

All pits should have crushed-rock and sump areas to clear groundwater and water used to clean the casing. Where ground water is found and pumping is required, the pits shall be lined with filter fabric.

This work shall consist of furnishing, boring, and jacking into place the type of pipe shown in the approved Construction Drawings or specified in the Special Provisions at locations and between the limits shown in the approved Construction Drawings or specified, and in accordance with these Standard Specifications.

18.04 EXCAVATION OF JACKING AND RECEIVING PITS

Jacking and receiving pits shall be excavated and sheathed, shored or braced in accordance with the Safety Regulations of the State of California, Department of Industrial Relations, Division of Industrial Safety, and in accordance with Section 7.19 of these Standard Specifications.

18.05 BACKFILL OF JACKING AND RECEIVING PITS

Jacking and receiving pits shall be backfilled in accordance with Sections 12.06 of these Standard Specifications.

18.06 PAYMENT

The price paid per linear foot of pipe, shall include full compensation for furnishing all labor, materials, tools and equipment, and doing all the work involved in furnishing and installing the pipe in place, including, but not limited to, excavating, constructing and backfilling jacking and receiving pits, constructing metal shields (jacking heads), and backfill of voids or cavities, all as shown in the approved Construction Drawings, as specified in these Standard Specifications, in the Special Provisions, and as directed by the Engineer.

SECTION 19 - SEWER AND STORM DRAIN STRUCTURES

19.01 DESCRIPTION

This work shall consist of constructing Portland Cement Concrete sewer and storm drain manholes, storm drain inlets and outlets and any miscellaneous structures appurtenant to sewers and storm drain all complete and in place at the locations shown in the approved Construction Drawings, the Engineering Improvement Standards, as specified in these Standard Specifications, and in Section 51 of the State of California Standard Specifications.

19.02 MANHOLES AND MATERIALS

a. Manholes: Manholes shall consist of a poured-in-place concrete base section, (except as otherwise provided by the Engineering Improvement Standards), a pre-cast or cast-in-place riser.

Section, a reinforced concrete taper section, grade rings, cast iron frame and cover, and poured-in-place concrete collars.

Where specified in the approved Construction Drawings or directed by the Engineer, manholes shall be left a minimum of one foot (1') and a maximum of eighteen inches (18") below final finish grade of streets or other areas to be reconstructed or where new streets or other facilities are to be constructed. The manhole frame and cover shall be temporarily set as specified by the Engineer. Unless otherwise specified, the Contractor will be required to raise these manholes to grade in accordance with the Engineering Improvement Standards for raising manholes to grade, including returning after construction or reconstruction of streets or other areas, shall be included in the price paid per manhole, and no additional payment will be made unless a bid item is provided therefore.

Where existing manholes need to be raised or lowered to meet a new street grade, they will be lowered below the grading plane as specified in Section 12.02 of these Standard Specifications and marked until the street has been paved. After the paving material has been compacted, they will be dug out, the frame and cover removed and raised to grade as shown in the Engineering Improvement Standards.

In all cases where manhole covers are to be brought to grade in areas with existing pavement, the repair shall be done in accordance with these Standard Specifications Sections 13 and 14 and shall equal in thickness and quality with the type of base, if any, and paving, that was existing or in accordance with the trench resurfacing requirements for the pipeline construction.

b. Materials: Concrete and mortar shall conform to the requirements of Section 10, "Portland Cement Concrete, Cement Mortar" of these Standard Specifications. Concrete for base and cast-in-place riser sections shall be Class 2.

Pre-cast riser sections, tapered cones of flat tops, and grade rings shall be reinforced concrete and shall conform to ASTM Designation: C478, using Type II cement.

c. Manhole Frames and Covers: Manhole frames and covers shall be twenty four inch (24") Identify Wilkerson and Nutwell or approved equal, and shall be of tough gray iron conforming to the specifications of the ASTM, A 48-48 for Class No. 30 castings, with the exception that no traverse test will be required. The bearing surfaces of manhole frames and covers shall be machine for bearing and the cover shall seat firmly into the frame without rocking. All castings shall be heavily coated with asphaltum paint with the exception of machines surfaces.

   All manhole covers shall be marked "City of Visalia", "Storm Sewer System" or "Sanitary Sewer System" as shown in the approved Construction Drawings.

d. Construction: Manholes shall be constructed in accordance with the Engineering Improvement Standards and as herein specified.

   All entering and leaving storm drain pipes shall be placed flush with the inside edge of the manhole.

   The base of sewer manholes shall be formed to create invert channels which shall be smooth and semi-circular in shape conforming to the size and flow line of the entering and leaving pipes.

   If a sewer main is laid through a manhole, the top of the pipe shall be carefully broken out and removed, leaving the bottom half of the pipe to form the flow line of the manhole. Rubber 'O' rings are required where PVC pipe is joined to concrete manholes.

   Changes in size and grade of invert channels shall be made gradually and evenly. Changes in direction shall be made with a smooth curve of as large of a radius as the size of the manhole will permit.

   The top of the base section shall be keyed to receive the tongue end of the riser section. The key shall be formed in the freshly poured concrete by using a template manufactured to the dimensions of the riser section. If the riser is cast-in-place monolithically with the base section by using a slip form or other means, the key may be omitted between the base and the riser. If the base and riser sections are not poured monolithically but separately, a key shall be provided in the base section. In either case, a key will be required in the top of the riser section to receive the tongue end of the tapered cone. Cast-in-place riser sections shall have the minimum wall thickness specified in the Engineering Improvement Standards.

   The joints between the base and all pre-cast elements of the manhole, including adjustment rings and manhole frame, shall be filled with cement mortar prior to joining the elements.

   The interior of the manhole shall be troweled smooth with a wooden trowel, removing excess mortar extruded out of joints for the entire height of the manhole, from the manhole frame to the floor. All excess mortar and any other debris shall be removed from the manhole.

e. Raising to Grade: Manholes constructed in finished roadway areas, or other finished areas, shall be brought to the same elevation as the surrounding finished surface in accordance with the Engineering Improvement Standards.

f. Abandoning Manholes: Manholes abandoned in place shall be broken out within two feet (2') of the finished grade. The manhole frame and cover will be delivered to the City Corporation Yard. Any pipes entering the manholes shall be sealed with concrete and the manhole backfilled with sandy soil and compacted to a relative compaction of ninety-five percent (95%) using optimum moisture and tested in accordance with Test Method No. California 216. Tests shall be provided in accordance with Section 6.02 of these Standard Specifications.

Manholes to be removed shall have the barrel and tapered section removed and the base broken up and disposed of. The manhole frame and cover will be delivered to the City Corporation Yard. After the complete manhole has been removed, the excavation will be backfilled in accordance with backfill requirements. Before backfilling, all sewer or storm drain pipes that have entered the manhole will be sealed with concrete. The cost of plugging existing pipes shall be included in the cost of removing the manhole and no additional payment will be made therefore.

19.03 STORM DRAIN INLETS AND OUTLETS

a. Materials: Concrete and mortar shall conform to the requirements of Section 10, "Portland Cement Concrete, Cement Mortar" of these Standard Specifications. Concrete shall be Class 2 using Type II Cement.

All metal parts shall be structural grade steel, except those permitted to be cast iron by the approved Construction Drawings or the Engineering Improvement Standards, and bar reinforcement shall conform to the requirements of Section 52, "Reinforcement" of the State of California Standard Specifications. All exposed metal parts, unless otherwise specified, shall be hot dipped galvanized approved by the Engineer.

b. Forms: Forms shall conform to the requirements of Section 10.07 of these Standard Specifications. The Contractor shall not place concrete in any forms until the forms have been approved for line and grade by the Engineer.

c. Construction: Storm drain inlets or outlets may be constructed either by completely forming the interior and exterior of the structure, or by forming only the interior and upper section and neat pouring concrete for the lower section against undisturbed earth that has been excavated to the lines and grades indicated in the approved Construction Drawings or as directed by the Engineer.

Storm drain inlets and outlets shall be constructed monolithically (one pour), or if the Contractor elects, the structures may be constructed in two sections (two pour), with no additional payment made therefore. Rubber 'O' rings are required where PVC pipe is joined to concrete manholes or storm drain inlets.

The surface finish of the exterior exposed surfaces of concrete shall conform to the

sidewalk, curb and gutter finish as required in Section 16.10 of these Standard Specifications. The interior surface shall have a wood trowel finish. Excessive voids shall be chipped and repaired as directed by the Engineer.

Depths of the storm drain inlets and outlets may vary according to the depth and grade at which the lateral pipe must be installed in order to avoid existing utilities. The Contractor shall allow in his bid price for the various inlet or outlet structures full compensation for any possible increase or decrease in the anticipated depth because of adjustment in depth of lateral pipes.

Lateral pipes connecting to storm drain inlets and outlets shall be installed flush with the inside walls of the structure.

Existing concrete work shall be removed and replaced as necessary to install proposed inlets and outlets, with full compensation therefore included in the unit price bid for said inlets and outlets.

A concrete pavement saw shall be used, unless determined to be impractical by the Engineer or unless some other method approved by the Engineer, such as removal of concrete to an adjacent expansion joint, obtains as satisfactory a result as saw cutting in removing of all existing concrete pavements, curbs, gutters, and sidewalks. A minimum of one and one-half inch (1½") depth of saw cut shall be used.

No separate payment shall be made for concrete saw cutting and full compensation therefore shall be included in the various bid items of work involving saw cutting.

Grading work in the immediate vicinity of the installed inlet structures shall be done by the Contractor as directed by the Engineer so as to provide for the movement of surface water to the newly installed inlet. Full compensation for said grading work shall be included in the price bid for inlet structures, and no separate payment will be made therefore.

At locations where inlets and outlets are constructed behind curb lines and within landscaped areas, all structure patching, final backfilling, final sprinkler system repairing and lawn reseeding and mulching behind the curb line shall be completed within fifteen (15) calendar days of placing the structure.

Where it is necessary to construct the curb and gutter portions of storm drain inlets and outlets on disturbed earth, a foundation for the curb and gutter shall be prepared by thoroughly compacting the disturbed material to the satisfaction of the Engineer.

19.04 MISCELLANEOUS STRUCTURES

a. Materials: Concrete and cement mortar shall conform to the requirements of Section 10 "Portland Cement Concrete, Cement Mortar" of these Standard Specifications. Concrete shall be Class 2, unless otherwise specified.

Bar reinforcement shall conform to the requirements of Section 52, "Reinforcement" of the State of California Standard Specifications. All metal parts shall be of structural grade steel, except those parts that may be cast iron as provided by the details in the approved Construction Drawings or the Engineering Improvement Standards.

All exposed metal parts, except as provided below, or unless otherwise provided in these Standard Specifications or the Special Provisions, shall be painted or dipped with an asphaltum paint approved by the Engineer.

Exposed metal parts for all outfall cages shall be galvanized by the hot dip method with the large pieces meeting the requirements as set forth in ASTM Designation: A123, and nuts, bolts and small pieces meeting the requirements as set forth in ASTM Designation: A153.

b. Construction: Miscellaneous facilities shall be constructed in accordance with the applicable portions of the Sections 19.02 and 19.03 of these Standard Specifications, and in accordance with the details and notes in the approved Construction Drawings or the Engineering Improvement Standards, or as directed by the Engineer.

The surface finish of the concrete shall conform to the sidewalk finish required in Section 16.10 of these Standard Specifications, or as required by the Engineer. The interior surface of the concrete shall have a wood trowel finish.

The cost of connecting storm drain or sewer laterals or pipelines to miscellaneous facilities shall be included in the prices bid for the various items of work requiring the connections and no additional compensation will be paid therefore.

19.05 EXCAVATION

Excavation for all structures shall conform to Section 12.05 of these Standard Specifications.

19.06 FORMS

Forms shall conform to the requirements of Section 10.07 of these Standard Specifications.

19.07 BACKFILL

Backfill for all structures shall conform to the requirements of Section 12.06 of these Standard Specifications.

19.08 CURING

Curing of exposed concrete surfaces shall comply with the requirements of Section 10.08 of these Standard Specifications.

19.09 PAYMENT

Payment for all structures, unless otherwise specified in the Special Provisions, will be made on a unit price per each basis and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and doing all work involved in constructing the structure in place complete, including, but not limited to, any and all structural elements, frame and cover assemblies, removal of existing concrete, excavation for the structure, excavating, connecting, existing or new lateral or main pipes, unless specified otherwise herein, and backfilling, all as shown in the approved Construction Drawings, the Engineering Improvement Standards, and as specified in these Standard Specifications, the Special Provisions, in the California Standard Specifications, and as directed by the Engineer.

SECTION 20 – SEWER PUMP STATION

20.01 GENERAL

All work involved in constructing sewer pump stations shall conform to the applicable provisions of the State of California Department of Transportation Standard Specifications, City Standards, the Engineering Improvement Standards and these Standard Specifications.

The following specifications represent the minimum specifications allowable for a duplex sewer pump station. Additional features or specifications may be required as needed.

20.02 REINFORCED CONCRETE

a. Scope of Work: The work included herein shall conform to Section 51 "Concrete Structures" and Section 90 "Portland Cement Concrete" of the State of California Standard Specifications. This work shall consist of furnishing all labor, tools, equipment and materials necessary for the installation of all structural concrete, minor concrete and mortar as shown in the approved Construction Drawings and specified in these Standard Specifications.

b. Structural Concrete:

   i. Strength: The minimum ultimate twenty-eight (28) day compressive strength of all structural concrete shall be three thousand two hundred fifty pounds per square inch (3,250 psi).

   ii. Concrete Mix: All structural concrete shall be Class 2 (590 pounds of cement/cubic yards of concrete) with Type II Portland Cement. The maximum size of aggregate shall be one and one-half inches (1½").

   iii. Slump: The amount of water used for mixing (including free moisture carried by the aggregate) shall not exceed the maximum necessary to produce a four inch (4") slump as determined by ASTM test method C143.

   iv. Placing: Concrete shall be placed in accordance with Section 51-1.09 "Placing Concrete" of the State of California Standard Specifications.

   v. Forms: All formwork shall conform to Section 51-1.05 "Forms" of the State of California Standard Specifications.

c. Defective Concrete: Concrete not meeting the minimum strength requirement, not formed as indicated, not true to intended alignment, which has large voids or rock pockets, which has wood or other debris embedded which has a surface deviation greater than one-eighth of one inch (⅛") in ten feet (10'), or does not fully conform to these Standard Specifications shall be deemed defective, and if so directed by the Engineer, shall be removed and replaced with concrete complying with the drawings and these Standard Specifications.

d. Minor Concrete:

i. Concrete Mix: All minor concrete shall be Class 2 (590 pounds of cement/cubic yards of concrete) with Type II Portland Cement. The maximum size of aggregate shall be one inch (1").

ii. Formwork: Earthen forms for exterior concrete surfaces shall be allowed only upon approval by the Engineer. The acceptability of the earthen forms shall be solely decided upon by the Engineer.

e. Mortar: All mortar shall conform to Section 51-1.135 "Mortar" of the State of California Standard Specifications.

f. Non-Shrink Grout and Drypack: Non-Shrink grout shall conform to Section 50-1.09, "Bonding and Grouting" of the State of California Standard Specifications with a required admixture using the following proportions:

Portland Cement	1 part by Wt.
Sand (100% Passing #8 Sieve)	1 part by Wt.
Water	4 V2 - 5 V2 gal./sack cement
Sika "Intraplast" N Admixture	1 % by Wt. of cement

Drypack shall be composed as for grout, except that only enough water shall be added to wet the mixture (no free water and no slump). Drypack shall be tamped into place and cured as specified for concrete in this Section.

Contractor shall not use non-shrink grout or drypack that has been mixed longer than thirty (30) minutes. No retemping shall be allowed.

g. Finishes on Walking Surfaces: The Contractor shall give a monolithic finish to the walking surfaces at all concrete floors and slabs within and adjacent to the structures which are to be constructed under this contract. All concrete surfaces to be so finished shall be thoroughly worked, brought to a uniform smooth finish and given a final brush finish.

h. Curing: All newly placed concrete shall be kept moist for the first seven (7) days after the concrete has been placed. This shall be achieved by one of the following methods:

i. Ponding.

ii. Cotton mats, rugs or carpets kept continuously wet.

iii. Kraft paper or plastic film with joints dealing or tapered. The perimeter of the paper shall be sprinkled once daily.

iv. Curing compound method: All exposed cast in place concrete shall be cured with white pigmented curing compound (State Spec. 8030-71 D-05, Type 1) in accordance with Section 90-7 "Curing Concrete" of the State of California Standard Specifications.

Forms may be used to cure formed portions in accordance with Section 90-701D "Forms-In-Place Methods" of the State of California Standard Specifications. If the forms are removed prior to seven (7) days after the pour, the newly exposed areas shall be cured for the remainder of the seven (7) days by one of the above methods.

20.03 METAL WORK

a. Scope of Work: The work included herein shall conform to Section 52 "Reinforcement", Section 55 "Steel Structures" and Section 75 "Miscellaneous Metal" of the State of California Standard Specifications. This work shall consist of furnishing all labor, tools, equipment and materials necessary for the installation of all reinforcing steel, structural steel and miscellaneous metal as shown in the approved Construction Drawings, as specified in these Standard Specifications and as directed by the Engineer.

b. Reinforcing Steel:

i. Materials:

(a) Bars shall be deformed bars conforming to ASTM A-615, as follows:

Bar Size	Grade
#4 and smaller	40
#5 and larger	60

(b) All reinforcing steel shall be new, clean, free from oil, dirt, loose mill scale, excessive rust, mortar, or other coatings that would destroy or reduce the bond.

c. Placing Reinforcement: The bending and placing of all reinforcement shall conform to the "Manual of Standard Practice" of the American Concrete Institute. Bends shall be made around a pin having a diameter of not less than four (4) times the bar diameter for stirrups and ties, six (6) times the bars except for bars larger than one inch (1") which shall be eight (8) times the bar diameter. Bars shall be bent cold.

Reinforcing shall be accurately placed in accordance with the drawings and shall be securely tied in position with at least sixteen gauge (#16) annealed wire at all bar intersections. Metal chairs and bolsters shall be used to hold all steel above the form bottoms at the proper distance. Metal spacers shall be used to secure the proper spacing of the steel. Precast concrete blocks shall be used to support reinforcing steel off the ground in footings and off the soffit of concrete exposed to weather. The clear distance between parallel bars shall not be less than one-half of one (½) times the bar diameter, but in no case less than one-half of one inch (½") nor less than one and one third (1⅓) times the maximum size of coarse aggregate.

Splices shall be made with a lap of at least thirty (30) bar diameters unless noted otherwise. The bars shall be placed in contract and wired together in such a manner as to maintain a clearance of not less than the minimum clear distance to the other

bars and to the surface of the concrete. Minimum clear distance to all concrete surfaces shall be two inches (2") unless otherwise noted in the approved Construction Drawings.

d. Pump Access Covers: The wet well shall be equipped with a pump access cover for each pump as shown in the approved Construction Drawings. Access covers shall be stainless steel-fitted aluminum construction, designed for access to submersible pumps. Covers shall be equipped with a guide bar bracket, safety chain hook, electric cable support, and a hasp for a padlock. Covers shall be of a size compatible with the pumps.

e. Valve Box Access Cover: Cover shall be double leaf, channel frame aluminum construction with stainless steel hardware and a hasp for a padlock. Cover shall be of a size compatible with valve box opening, minimum size shall be five feet by six feet (5' x 6') with each leaf being three feet by five feet (3' x 5'). The cover shall withstand a live-load of at least three hundred pounds per square foot (300 psf) and be equipped with spring door operators and automatic hold open arms. The cover construction shall have a mill finish with Bituminous Coating applied to exterior of the frame.

f. Anchor Bolts and Concrete Anchors: Concrete anchorage devices shall be installed in the concrete as shown in the approved Construction Drawings so that the attached equipment will bear firmly against the concrete. The concrete anchors for the pump discharge mount shall be RED HEAD RED-CHEM STAINLESS STEEL CONCRETE ANCHORS # CHEM-2034, three-fourths of one inch (¾") diameter, or approved equal.

g. Bolted Connections: All bolts, nuts and washers within the wet well shall be stainless steel.

20.04 PAINTING

a. Scope of Work: Under this item, the Contractor shall furnish and apply to the satisfaction of the Engineer, protective paint in colors as selected by the Engineer. All exposed interior and exterior metal surfaces, except aluminum, galvanized steel, stainless steel and chrome plated metal, shall be coated.

All paint shall be delivered in original containers and shall be applied in strict accordance with the recommendations of the manufacturer.

b. Preparation of Surfaces:

i. Concrete Surfaces: Before painting, all concrete surfaces to be painted shall be thoroughly cleaned. Surfaces to be painted shall be completely wire brushed to remove any loose concrete or paint, and cracks shall be patched. Concrete surfaces to be painted shall have all air pockets or other imperfections filled, so that a smooth surface results. All surfaces shall be completely dry prior to painting.

Concrete surfaces which shall be coated with a protective coating for the purpose of protecting the concrete surface, shall have all air pockets or other imperfections in the concrete filled, so that a smooth concrete surface results, after the surface has been opened, it shall be accomplished soon after the removal of the forms to promote adequate adhesion. Covering over the surface with a thin layer of mortar shall not be acceptable.

ii. Metal Surfaces: All metal work to be painted shall be absolutely clean and free of all rust and grease.

All exposed cast iron or steel piping to be painted, which has a previously applied coal tar derivative, shall be primed, prior to finish coating, with two (2) coats of Koopers "Tarstop", or approved equal.

iii. Completion of Surface Preparation: After the Contractor has completed the job of preparing all surfaces to be painted, the surfaces shall be inspected and approved by the Engineer prior to the application of any protective coatings.

c. Materials: Under these Standard Specifications, all paint products to be furnished for application shall be as manufactured by Koppers, or approved equal.

d. Coating System:

i. One (1) coat of Bitumastic #50 M. The completed surfaces shall have a dry thickness of at least 16 mil.

ii. Two (2) coats of Bitumastic #300 M. First coat to be red, second coat to be black. Application of second coat to be applied within twenty-four (24) hours of the first. The completed surfaces shall have a dry thickness of at least sixteen millimeters (16 mil).

iii. One (1) coat of 622 Rust Penetrating Primer followed by two (2) coats of Glamortex 501 Enamel, color: OSHA Safety Blue.

iv. The completed surfaces shall have a dry thickness of at least three millimeters (3 mil).

e. Exterior Concrete Painting: Coating System "i" above, shall be used to paint the wet well and valve box exterior surfaces in contact with the soil.

f. Interior Concrete Painting: After surface preparation, the Contractor shall paint all submerged concrete surfaces, surfaces exposed to sewage fumes, all valve box interior, with Coating System "ii" above.

g. Wet Well Metalwork Painting: All exposed metalwork surfaces which are submerged or subjected to sewage fumes shall be painted with Coating System "ii" above. Metal located within water containing compartments shall be considered submerged. The pumps, pump discharge, pump power cables and lifting cables are not to be coated. Also the access covers are not to be coated.

h. Valve Box Metalwork Painting: All exposed metalwork surfaces in the valve box shall be painted with Coating System "iii" above. The access cover is not to be coated.

20.05 PIPEWORK

a. Scope of Work: Under this Section, the Contractor shall furnish all labor and materials for, and shall install, complete and test as specified, all pipework and appurtenances constructed under this contract.

Shop drawings are required to be submitted by the Contractor to the Engineer for all fabricated pipework, valves and special fittings.

b. Materials:

i. PVC Gravity Sewer Pipe: PVC sewer pipe shall conform to City standards and the requirements of ASTM D 3034, SDR 35, and shall have gasketed joints.

ii. PVC Force Main: PVC force main shall conform to AWWA C900 and shall be class 150. Ductile Iron Pipe (D.I.):

Ductile iron pipe and fittings shall be cement mortar lined. Pipe joints shall be flapped or as shown in the approved Construction Drawings. Applicable sections of the following standards apply.

Standard	Item
AWWA C151	Ductile Iron Pipe
AWWA C104	Cement Mortar Lining
AWWA C110	Fittings
AWWA C111	Rubber Gasket Joints

iii. Cast lion Fittings (C.I.): Cast iron fittings shall be in accordance with the AWWA Standard C 110-77, "Gray Iron and Ductile Iron Fittings, three inch through forty-eight inch (3"-48"), for Water and other Liquids".

iv. Couplings and Flanges: In the locations shown in the approved Construction Drawings, flanged coupling adaptors shall be Ford Style FFCA and flexible couplings shall be Ford Style FCI or approved equal.

Flanges shall be of a size and pattern to fit valves and other piping to which they are to be connected.

v. Small Piping and Fittings: These Standard Specifications shall apply to all metal pipe four inches (4") in diameter and smaller, other than cast iron piping, and shall also apply to all valves and cocks, unions, fittings, and connecting devices, and to pipe lines furnished as a part of the several piping and equipment items within the pump station. Small pipe shall include all nuts, bolts, gaskets, hangers, supports, the drilling of holes and flanges, and all materials and labor that may be necessary to the best installation of this class of

work.

(a) Fittings: All screwed fittings shall be "American Standard Malleable Iron Screwed Fittings", three hundred pounds (300 lbs) W.O.G. of standard form and dimensions. Malleable iron shall conform to current standard specifications for malleable iron.

Castings, as adopted by the ASTM. All fittings shall be galvanized to correspond with pipe on which they are installed.

All fittings necessary for the satisfactory alignment and arrangement of piping and all necessary unions and cleanouts shall be furnished by the Contractor.

vi. Gate Valve: All gate valves shall have standard flanged ends. Each valve shall have a two inch (2") square operating nut. Valves shall correspond in size with the run of pipe on which it is installed, except as otherwise noted. Gate valves shall be four inch (4") CLOW AWWA, F-5070, or approved equal.

vii. Swing Check Valve: Check valves shall be flanged, iron body, bronze-mounted check valves. Hinge pins shall be stainless steel or other noncorrodible metal, and the stuffing box assembly shall be made of bronze, securely screwed to the valve body. Swing check valves shall be Mueller check valves catalog number A-2600-6.02 or approved equal.

c. Pipework in Concrete: Where formed holes are left in the concrete, the Contractor shall be responsible for the accuracy of their location and for sealing around pipes to produce water tightness where necessary. He shall also provide any necessary pipeline openings through the concrete which may have been omitted.

d. Domestic Water Service: The Contractor shall provide and install all items as shown in the approved Construction Drawings and as needed to supply two inch (2") water service per City of Visalia Engineering Improvement Standards.

e. Reduced Pressure Backflow Preventer: The backflow preventer shall be a reduced pressure principle type and shall be suitable for supply pressure up to one hundred seventy-five pounds per square inch (175 psi). The backflow preventer shall be designated for inline servicing. The device shall be Febco Model 825Y for a two inch (2") service, or approved equal.

f. Domestic Water Spigots: Contractor shall supply one (1) spigot as shown in the approved Construction Drawings.

g. Wet Well Water Stops: All cored openings in the wet well wall shall be sealed with water stops secured by stainless steel bands and non-shrink grout as specified in Section 21.02.f of these Standard Specifications.

Water stops shall be Femco "Large Diameter Water Stops", or approved equal.

h. Discharge Wash-Down Assembly: Wash-down assembles as shown in the approved Construction Drawings shall use eight inch (8") by one inch (1") Tap Rockwell 323 Double Strap bronze saddles, or approved equal.

i. Wet Well Construction: Wet well shall be constructed using seventy-two inch (72") diameter, Class IV reinforced concrete pipe sections manufactured to meet ASTM Standards C76, C443, and C655. The wet well shall be constructed with no more than three (3) pipe sections. The lower wet well section shall be a minimum of six feet (6') in length.

   Interior surfaces shall be painted prior to the installation of pumps. The discharge connection mating surface shall be kept clean and free of all paint.

j. Sewer Manholes: The Contractor shall construct the sewer manholes as shown in the approved Construction Drawings, per the City of Visalia Engineering Improvement Standard "*60" Sanitary Sewer Manhole*".

20.06 MECHANICAL EQUIPMENT

a. Scope of Work: Under this Section the Contractor shall furnish and install all mechanical equipment and appurtenances for this project as shown in the approved Construction Drawings and hereinafter specified. All such equipment shall be placed by the Contractor in satisfactory operating condition as an integral part of the construction of the project.

   The Contractor shall provide and install all necessary items and appurtenances required for the proper placement and functioning of the project components as intended, whether such items and appurtenances are directly specified or not.

   All equipment shall be designed, manufactured and assembled in such a manner so as to perform satisfactorily within housings, enclosures and the environment into which it is to be installed and operated. All items shall be tested in place. Required supervision for installing, testing and starting shall be furnished by factory-trained personnel at no charge.

   These specifications include the supply and the installation of two (2) vertical, mixed-flow propeller, oil-flushed lubricated, enclosed line shaft pump. The unit shall include a bowl assembly, suction strainer, column, enclosing tube and lineshaft, discharge head, sealing assembly, and driver.

b. Quality Assurance: All pumping equipment furnished under these Standard Specifications shall be of a design and manufacture that has been used in similar applications with a minimum four (4) years of service.

   The unit, including the motor and all the accessories, shall be provided by the pump manufacturer to insure compatibility. A warranty and quality assurance program is required for all the components.

   Pump is to be engineered and manufactured under the certification of ISO-9001:2000.

The Contractor shall verify all actual dimensions of existing and new construction equipment areas, bases and mountings; and he shall be responsible for insuring proper fit of the equipment selected for installation. The Contractor shall be fully responsible for the compatibility of furnished mechanical, electrical, pipework and structural items and appurtenances.

c. Pump Warranty: The pump manufacturer shall warrant the pumps and motors being supplied to the Owner against defects in workmanship and materials for a period of one (1) year under normal use, operation and service. The warranty shall be in printed form and shall apply to all similar units.

d. Submersible Pumps, Motor and Slide-away Coupling: The Contractor shall furnish and install a totally submersible pump, as shown in the approved Construction Drawings and as described hereinafter. The pumping unit shall conform to the following characteristics:

(*Brand, size*) Model _____ Torque-flow vortex submersible pumps with _____ HP, _____ phase, _____ volt, _____ hertz submersible motors and slide-away casings.

Pump casing shall be constructed of ASTM A48 Class 30 grey iron and shall be completely open from suction to discharge with now wearing rings or impeller face plates required. All internal case clearances shall be equal to the discharge diameter so that all material which will pass through the discharge can pass through the pump.

The impeller shall be of the recessed design, constructed of ASTM A48 Class 30 grey iron and shall be mounted completely out of the flow path between the pump inlet and discharge connection, so that the solids pumped are not required to flow through the impeller. The impeller shall be keyed to the motor shaft and secured by an impeller bolt.

The motor shall be provided with thrust and radial bearings to carry the entire load which may be imposed upon it under all operating conditions. Motor shall be approved by Underwriters Laboratory for operation in a Class I, Group D, Division I hazardous location.

The motor shall have two (2) mechanical seals; the lower one outside the motor and protecting the upper one which is an oil-filled chamber. Moisture detector probes in the oil-filled seal chamber shall be connected to a customer-supplied alarm to indicate the presence of moisture in the seal chamber. Thermal over-load protectors shall be imbedded in the motor windings and connected to the starter to disconnect the motor in the event of overload.

The slide-away coupling shall consist of a foot-mounted discharge elbow and adaptor, steel baseplate, upper and lower rail supports, lifting yoke and cable. All metal to metal interfaces where movement might occur shall be non-sparking. The foot-mounted discharge elbow and adaptor shall conform to ASTM A48 Class 30 grey iron.

Lifting cable and hardware shall be stainless steel. Cable shall have a minimum working load of two thousand four hundred pounds (2,400 lbs.) and shall be supplied by the pump manufacturer.

e. Propeller: The propeller shall be of bronze construction conforming to ASTM B584, C83600. The propeller shall be of one-piece construction, mixed-flow, 3-vane. Vane leading edges shall be rounded to prevent accumulation of fibrous material. Propeller shall be statically and dynamically balanced to limit vibration and supported on both sides by sleeve-type bearings for stability.

   Propeller is to be secured to the shaft by means of a steel drive collet and lock nut to prevent axial movement.

   Propeller location within the bowl shall be adjustable by means of a top shaft-adjusting nut when utilizing a vertical hollow-shaft motor.

f. Bowls: The bowls shall be made of close-grained cast iron conforming to ASTM A48 CL30. Castings shall be free from blowholes, sand holes and shall be accurately machined and fitted to close dimensions.

   Bowls shall be flange connected.

   The bowl assembly shall include a cast iron suction bell of the flared inlet type incorporating a permanently grease-packed bronze bearing. The suction bell shall incorporate a minimum of three (3) guide vanes designed to minimize entrance losses and reduce vortexing.

   A bronze sand cap shall be provided to prevent entrance of sand into the suction bell bearing.

   The discharge bowl shall be provided with a bronze bearing immediately above the propeller as well as a bronze connector bearing.

g. Propeller Shaft: Propeller shaft shall be of stainless steel construction conforming to ASTM A582 (416 stainless steel) designed to transmit the drive torque required.

   The shaft shall be supported by bronze bearings located on both sides of each propeller.

   Propeller shaft coupling shall be of carbon steel construction conforming to ASTM A108 GR12L14.

h. Column: Column pipe shall be straight, flanged and furnished in sections not over than eight feet (8') in length.

i. Line shafts: Line shafting shall be of ample size to transmit the torque and operate the pump without distortion or vibration.

   Line shafting shall be made of carbon steel conforming to AISI 1045 and be furnished in sections not over eight feet (8') in length.

Line shafting shall be coupled with extra-strong threaded steel couplings.

An enclosing tube shall be provided to house the lineshaft. It shall be of extra-strong ASTM A120, Schedule 80 pipe construction and furnished in interchangeable sections not over five feet (5') in length. Each end of the enclosing tube shall be machined to receive bronze connector bearings.

Enclosing tube connector bearings shall be of bronze material conforming to ASTM B505 C93200 material.

j. Discharge Head Assembly: The pump discharge head shall be cast iron with an ANSI 125# discharge flange.

The discharge head shall be of sufficient design to support the entire weight of the pump and driver.

A drive shaft of the same material as the lineshaft shall extend through the sealing assembly of the discharge head and be coupled to a vertical hollow shaft.

The shaft sealing assembly shall consist of a bronze tension box, cast iron packing gland, bronze connector bearing, stainless steel top shaft sleeve, stainless steel packing box washer, stainless steel packing gland nuts and bolts and synthetic packing.

Discharge head openings shall be fitted with guards to prevent injury from the rotating shaft and/or coupling.

k. Performance: Each pump shall be capable of operating at the following conditions:

First design point = _____GPM @ _____TDH.

Second design point = _____GPM @ _____ TDH.

(Maximum) shut off = _____ feet.

Impeller selected shall be capable of operating at all three (3) design points without exceeding BHP.

Minimum clearance through case = Inches

l. Pump Test: The pump manufacturer shall perform the following inspections and tests on each pump before shipment from factory:

i. Impeller, motor rating and electrical connections shall first be checked for compliance to the Customer's purchase order.

ii. A motor and cable insulation test for moisture content or insulation defects.

iii. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.

iv. The pump shall be run for thirty (30) minutes submerged, a minimum of six feet (6') under water.

v. After operational test "iv" above, the insulation test "ii" above is to be performed again.

A written report stating the foregoing have been done shall be supplied with each pump at the time of shipment.

The pump cable end will then be fitted with a shrink fit rubber boot to protect it prior to electrical installation.

m. Documentation: Standard drawings supplied shall include pump outlines, controls, access frames and typical installation guides. Electrical control wiring diagrams shall be supplied. Instruction and maintenance manuals and pump parts lists for the pumps installed shall also be supplied.

n. Acceptance Tests: After installation, each pumping unit shall be given a running test, during which it shall demonstrate its ability to operate without vibration, overheating or excessive current draw, and to pump the capacity and head specified. These tests are to be conducted by the Contractor in the presence of the Engineer. The Engineer shall be given at least twenty-four (24) hours notice in advance of each test.

A certified factory performance test shall be performed on the bowl assembly in accordance with Hydraulic Institute Standards, latest edition. Tests shall be sufficient to determine the curves of head, input horsepower, and efficiency relative to capacity from shutoff to one hundred fifty percent (150%) of design flow. A minimum of six (6) points, including shutoff, shall be taken for each test. At least one (1) point of the six (6) shall be taken as near as possible to each specified condition.

During the tests, observations shall be made of motor input, vibration, noise and overheating to detect any defects in the equipment. Written results of each test shall be submitted by the Contractor to the Engineer prior to approval of the tested pumps.

The Contractor shall provide at his expense the necessary water, gauges, meters, piping and labor necessary for conducting the tests. All adjustments needed to place the equipment in satisfactory working order shall be made at the time of the tests. All defects or defective equipment revealed by or noted during a test shall be corrected or replace promptly at the expense of the Contractor, and if necessary, tests shall be repeated until satisfactory results are obtained.

In case the Contractor is unable to demonstrate to the satisfaction of the Engineer that the units will satisfactory perform the service required, and that they will operate free from vibration and over heating, the units may be rejected. The Contractor shall then remove and replace the equipment at his own expense.

20.07 ELECTRICAL WORK

a. Scope of Work: The Contractor shall provide all the required labor, project equipment and materials, tools, construction equipment, safety equipment, transportation, test equipment, and satisfactorily complete all the electrical work shown on the drawings and included in these Standard Specifications.

   The electrical work for this project includes providing all electrical materials and equipment required for a complete and fully operating facility. The Contractor shall provide temporary power for system testing.

   Included in this work is providing all required conduits, conductors, and cables including those specified; shown on the drawing; and neither specified nor shown on the drawings, but nonetheless required for satisfactory interconnection and operations of all electrical, mechanical and instrumentation equipment either shown on the respective drawings, specified in the respective portions of these Standard Specifications, or otherwise required.

b. Codes: All the electrical equipment and materials, including their installations, shall conform to the following applicable codes:

   i. National Electrical Code, Latest Edition

   ii. State Electrical Code, Latest Edition, Title 24 Part 3

   iii. Occupational Safety and Health Act Standards

   iv. City of Visalia California Municipal Code

c. Variances: In instances where two codes are at variance, the more restrictive requirements shall apply.

d. Standards: Equipment shall conform to the applicable Energy Information Alliance (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufactures Association (NEMA) Standards.

e. Drawings: The electrical drawings shall govern the general layout of the completed construction. Except where special details are used to illustrate the method of installation of a particular piece or type of equipment or materials, the requirements or descriptions in these Standard Specifications shall take precedence in the event of conflict.

f. Pump Station Control System: Contractor shall furnish and install the ultra sonic control for the two (2) pumps to be installed in the station. The system shall be the Milltronics Hydro Ranger 200 as described in manuals by Siemens Milltronics Process Instruments Inc., 1954 Technology Drive, P.O. Box 4225 Peterborough, Ontario Canada, K9J7B1. Enclosure shall be Type 4X/NEMA 4X/1P65 poly carbonate, nine and five-tenths inches by six and nine-tenths inches by three and five-tenths inches (9.5”x6.9”x3.5”). A.C. power shall be 240V ac, 50/60 Hz, 36 VA (17W). Fuse: F3: 2G, slow blow, 0.375A, 250V. Temperature sensor fuse F2:

Belling Lee, L754, 4000A HRC, ceramic type, 50mA, 250V. Mount enclosure at shoulder height in ambient temperatures between minus five degrees Fahrenheit (-5° F) to one hundred twenty-two degrees Fahrenheit (122° F) in relative humidity suitable for outdoors (Type/Nema 4X, IP65 enclosure). If mounted in secondary enclosure provide louvers and ventilation by fan to maintain ambient temperature within operating limits. Mounting to provide easy access for hand programmer and avoid exposure to direct sunlight and proximity to high voltage, current runs & variable frequency motor speed controls.

Output from the ultra sonic control system shall be to display, chart recorder, alarm, pump control, and to actuate the emergency power system for the stations operation.

Contractor shall furnish and install one (1) Ultra Sonic Milltronics Hydro Ranger 200 control system and control panel (conforming to NEMA 3R and 12 Standards) with a hinged inner door (dead front) fabricated from 5052-H32 eight-tenths of one inch (0.080") thick marine alloy aluminum. The inner door shall be held closed by two hand operated one quarter (¼) turn fasteners and shall contain the control instruments and indicators. The tamper proof outer door shall be lockable using a hasp. Ventilation shall be provided by air inlet louvers on one side of the enclosure together with a temperature activated cooling fan with capacity of sixteen cubic feet per second (16 ft^3/sec)., the thermostatically controlled fan shall be manually adjustable to turn on between ninety degrees Fahrenheit (90° F) and one hundred twenty-two degrees Fahrenheit (122° F) with a differential of not more than forty-three degrees Fahrenheit (43° F) between turn on and turn off. The cabinet fan circuit shall be fused at one hundred twenty-five percent (125%) of ampacity of the fan motor installed. The air inlet louvers and air outlet openings shall be located to direct the bulk of the air flow over the Hydro Ranger 200 Controller. Enclosure shall be a double compartment NEMA and contain space for service entrance equipment on the left side.

g. Control Panel: The entire control panel shall be UNDERWRITERS LABORATORY LISTED and furnished with a UL LABEL. Each component shall be factory mounted, wired, inspected and tested. A wiring diagram and heater chart shall be enclosed in the panel. A red "High Voltage Inside" nameplate shall be fastened to door covering the high voltage compartment. All components including indicating lights, switches, buttons, relays, accessories, and permanently identified as to their function with the components. The identifications shall be in the form of photo etching, silk screening or engraving. All terminal blocks shall be identified by both number and graphic symbols which clearly indicate the purpose of each terminal block. All control wiring shall be numbered at each termination. The panel enclosure shall be free standing and mounted on a reinforced concrete pad. The lower compartment shall have a lockable access door and be flush with the concrete pad.

The enclosure shall be constructed of fourteen gauge (#14) steel. The entire unit shall be degreased, cleaned and treated with a phosphatizing process, then primed and painted inside and out with corrosion-resistant, industrial-grade baked enamel. The finish coat shall be ASA-61 Gray.

h. Control System Operation: The control system shall provide total automatic control for two (2) motor driven pumps operating on _____ volts, _____ phase, wire service. The wet well level shall be monitored and controlled as follows:

Level 5 - High Level
Level 4 - Start Lag Pump
Level 3 - Start Lead Pump
Level 2 - Stop Lag Pump
Level 1 - Stop Lead Pump

Contingent upon the wet well level, the control system shall cause the liquid level indicator/controller to energize the appropriate control contacts. Upon wet well level rise, the lead pump start contact (Level 3) shall be energized causing a relay in the pump logic controller to start the lead pump. If the level continues to rise to the lag pump start control (Level 4), the controller shall energize a relay to start the lag pump, and both pumps shall run simultaneously. The liquid level shall be lowered until the lag pump stop contact (Level 2) is reached, stopping the lag pump. The lead pump shall continue to run lowering the wet well level until the lead pump stop contact (Level 1) is reached. Upon the next wet well level rise, the lead pump selection shall be alternated. If the wet well level rises to high level contact (Level 5), it shall energize a relay in the pump logic controller to operate the alarm system and indicate a high water condition.

The control system shall be built in such a manner that the Owner will have the ability to select high level alarm activation at a separate specific level or have it activated when start lag pump level is reached. The Owner shall have the ability to select independent start and stop for the lead and lag pumps, or a common stop for both pumps.

i. Liquid Level Indicator/Controller: The liquid level indicator/controller shall be equipped with manual testing capability located on the inner door. The operator shall be able to simulate rising and falling liquid level.

Monitoring and control of the liquid level in the wet well shall be by transducers installed in the wet well above the liquid as recommended by the manufacturers. The echo from the output at the transducer is processed back through to the Hydro Ranger 200 control panel and controller which generator outputs to relays in the control panel turning the pumps on/off as programmed as well as controlling programmed alarms and emergency power actuation.

j. Logic Controls: The duplex logic control system shall consist of the logic chassis mounted on the subpanel and the logic panel mounted on the dead front door. The logic chassis shall be a pre-wired assembly constructed of anodized aluminum containing logic and alarm circuits. The logic chassis shall interface with the wet well level liquid indicator/controller. The logic chassis shall contain a three (3) point terminal block for 120 VAC supply power, a power on-off switch for 120 VAC power, a 15 amp circuit breaker to protect 120 VAC power; a 120/240 VAC control transformer, a three (3) position lead pump selector switch that can operate in either “automatic alternation”; “lead pump #1 - Lag pump #2 - lag pump #1”

positions. Relays shall be square base, plug-in type, 3 pole double throw rated at 10 amp, 240 VAC with epoxy encapsulated coil and clear dust cover and shall be directly interchangeable. Five (5) LED status indicator lights shall be mounted adjacent to the relay sockets and wired in parallel with the relay coils to indicate that the power is applied to the coils. All relays shall have mechanical hold-down bales.

All terminals on the logic chassis shall be of the barrier clamp plate type rated at 15 amp at 300 VAC and accept two (2) fourteen gauge (#14) wires. Terminal blocks shall be provided for interfacing output from the liquid level indicator/controller to the logic chassis via a multi-conductor cable shall be identified with yellow heat shrink tubing with black nomenclature. Labels shall read as follows: High Level Alarm, Start Lag Pump, Start Lead Pump, Stop Lag Pump, Stop Lead Pump, and Common.

The logic panel shall be constructed of corrosion resistant anodized aluminum, and connected to the logic chassis via a multi-conductor cable. The logic panel shall be mounted on the inner door. The logic panel shall have the following components: Two (2) "hand-off automatic" selector switches for pumps, two (2) "pump run" green LED Indicators, one (1) 240 VAC "power on" yellow LED indicator, one (1) "start lag pump" yellow LED indicator, one (1) red push button for audible alarm silence, one (1) "high level alarm" red LED indicator and one (1) red push button for visible alarm reset. Provide two (2) 6-digit non-resetable, dust tight, oil tight and moisture resistant running time meters.

k. Back-Up System for Liquid Level Control: A backup control system shall be provided consisting of a system of float switches (SM-2 floats). The float system shall be turned on and off by one (1) switch at the control panel. The float switches (mercury switches) shall be installed at the water surface elevations shown in the wet well and coincide with actuating installed relays in the control panel turning the pumps on and off in the same sequence as the ultra sonic system. The float activated control system shall remain in the off mode till manually turned on at the control panel by a single switch.

l. Power Handling: Main lugs of the appropriate size shall be furnished for connecting the incoming supply power. The lugs shall be suitable for use with aluminum or copper conductors. Ground lugs of appropriate size shall be bolted to the sub-panel. Motor circuit protection shall be either type, shall contain a self test magnetic motor circuit protectors. Either type shall contain a self test "Trip Selector" permitting a mechanical simulation of the over current tripping device. The protector operating mechanisms shall be quick-mate, quick-break and trip-free type. Thermal magnetic breakers shall comply with Federal SPE.W-C 357a as Class Two breakers. Symmetrical amperes interrupting ratings shall be 10,000 amps minimum for 240 volt rated breakers and 15,000 amps minimum for 480 volt rated breakers. Magnetic motor circuit protectors shall provide instantaneous clearing of faults to a minimum of 10,000 amperes, RMS, symmetrical and shall have an adjustable instantaneous trip settings. Q-Frame type circuit breakers are not acceptable.

Circuit breaker toggles shall be operable through external extension handles that will interlock with the dead front door.

Each motor starter shall be NEMA rated, FVNR, with three (3) overload relays and reset button. The Contractor shall feature double break, silver cadmium oxide contacts, pressure type terminals, and barriers, free floating armature-magnet frame, molded continuous duty coils and stainless steel springs sized for the specific pumps supplied under this contract. Definite purpose Contractors, horsepower rated motor starters, and fractional NEMA sizes are not acceptable. Motor starter overload reset operators shall be reset without opening the dead front door.

A 100 watt strip heater and separate thermostat set at the appropriate temperature to prevent corrosion-causing condensation and freezing shall be supplied.

A control transformer, adequately sized for the connected load shall be provided on 3 phase, 3 wire system. The transformer shall be protected by fuses or circuit breaker. The control transformer may be eliminated on a 4-wire, single phase systems providing that the control voltage is protected by a circuit breaker and is wired per NEC Standards.

The unit shall be equipped with the capability to connect an emergency backup natural gas engine.

m. Optional Equipment: (As required) Provide a NEMA 4X, red lexan, break resistant globe and 75 watt lamp.

SECTION 21 – SIGNALS, LIGHTING, AND ELECTRICAL SYSTEMS

21.01 DESCRIPTION

Furnish and install all equipment, materials, and components for traffic signals and lighting system, pursuant to the provisions of the State of California Standard Specifications Section 86, "Signals, Lighting, and Electrical Systems", the Engineering Improvement Standards, these Standard Specifications and the Special Provisions. Where reference is made to Section 90, "Portland Cement Concrete", of the State of California Standard Specifications, the State of California Standard Specifications shall be used.

21.02 EQUIPMENT LIST AND DRAWINGS

The controller cabinet schematic wiring diagram and intersection sketch shall be combined into one (1) drawing so that when the cabinet door is fully open, the drawing is oriented with the intersection.

The Contractor shall furnish a maintenance manual for all supplied controller units, auxiliary equipment and vehicle detector sensor units, control units, and amplifiers. The maintenance manual and operation manual may be combined into one (1) manual. The Maintenance Manual or combined Operation and Maintenance (O&M) Manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, previous to purchase. The Maintenance Manual shall include, but need not be limited to, the following items:

a. Specifications,
b. Design characteristics,
c. General operation theory,
d. Function of all controls,
e. Trouble-shooting procedure (diagnostic routine),
f. Block circuit diagram,
g. Geographical layout of components,
h. Schematic diagrams,
i. List of replaceable component parts with stock numbers.

21.03 FOUNDATIONS

Portland Cement Concrete shall conform to Section 90-10, "Minor Concrete," of the State of California Standard Specifications and shall contain not less than four hundred seventy pounds (470 lbs.) of cement per cubic yard, except concrete for reinforced pile foundations shall contain not less than five hundred sixty-four pounds (564 lbs.) of cement per cubic yard.

21.04 MISCELLANEOUS CONCRETE CONSTRUCTION AND REMOVAL

Contractor shall coordinate traffic signal and lighting construction with access ramp construction to minimize the amount of miscellaneous concrete construction and removal.

Removing concrete shall conform to the provisions in Section 15, "Existing Highway Facilities," of these Standard Specifications and the Special Provisions.

Concrete removed shall be disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the State of California Standard Specifications.

Where no joint exists between concrete to be removed and concrete to remain in place, the concrete shall be cut in a neat line to a minimum depth of seventeen-hundredths of one foot (0.17') with a power-driven saw before concrete is removed. Curb, gutter, and sidewalk shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the State of California Standard Specifications. Replacement of sidewalk and wheelchair ramps shall be considered as included in the contract price.

21.05 STANDARDS, STEEL PEDESTALS, AND POSTS

Section 86-2.04, "Standards, Steel Pedestals, and Posts," of the State of California Standard Specifications is amended by adding the following after paragraph eleven:

> *All galvanized nuts used on assemblies with a specific pre-load or torque shall be lubricated in accordance with the requirements specified for galvanized Grade DH nuts in ASTM Designation: A563.*

The sign-mounting hardware shall be installed at the locations shown in the approved Construction Drawings. The sign panels shall be furnished by the Contractor. Where the approved Construction Drawings refer to the side tenon detail at the end of the signal mast arm, the applicable tip tenon detail may be substituted.

21.06 CONDUIT

All conduit shall be rigid metal type.

When a standard coupling cannot be used for coupling metal type conduit, a UL-Iisted threaded union coupling, as specified in the third paragraph in Section 86-2.05C "Installation" of the State of California Standard Specifications, or a concrete-tight split coupling or concrete-tight set screw coupling shall be used.

Conduit shall be installed by jacking or drilling in accordance with Section 86-2.05C "Installation" of the State of California Standard Specifications. Installation of conduit by the trenching method will only be permitted when requested by the Contractor, in writing, and approved by the Engineer. When used, the trenching method shall be as provided below.

Conduit runs shown in the approved Construction Drawings to be located behind curbs may be installed in the street, within three feet (3') of and parallel to the gutter line of the curb, by trenching as provided below. All pull boxes shall be located behind the curb or at the location shown in the approved Construction Drawings.

After conductors have been installed, the ends of conduits terminating in pull boxes and in service and controller cabinets shall be sealed with an approved type of sealing compound.

At locations where conduit is to be installed by jacking or drilling as provided in Section 86-2.05C "Installation" of the State of California Standard Specifications, and if delay to any vehicle will not exceed five (5) minutes, conduit may be installed by the trenching method as follows:

a. Trenching Installation of Conduit: Conduit shall be placed under existing pavement in a trench approximately two inches (2") wider than the outside diameter of the conduit to be installed. Trench shall not exceed six inches (6") in width. Conduit depth shall not be less than eighteen inches (18") in depth, except that at pull boxes the trench may be hand dug to required depth. The outline of all areas of pavement to be removed shall be cut to a minimum depth of three inches (3") with a rock-cutting excavator specifically designed for this purpose. Cuts shall be neat and true with no shatter outside the removal area. The conduit shall be placed in the bottom of the trench, and the trench shall be backfilled with a two-sack slurry cement, conforming to two appropriate portions of Section 19-3.062 of the State of California Standard Specifications. The top of slurry mix shall be two inches (2") below A.C. Pavement, after slurry mix has set-up, the trench shall be patched with one-half of one inch (½") mix asphalt concrete.

   Prior to spreading asphalt concrete, paint binder shall be applied as specified in Section 39-4.02, "Prime Coat and Paint Binder" of the State of California Standard Specifications. Spreading and compacting of asphalt concrete shall be performed by any method that will produce an asphalt concrete surfacing of uniform smoothness, texture, and density.

   All excavated areas in the pavement shall be backfilled, except for the top two inches (2"), by the end of each work period.

21.07 PULL BOXES

Grout shall be placed in bottom of pull boxes.

21.08 CONDUCTORS AND WIRING

Splices shall be insulated by "Method B."

21.09 SIGNAL CABLE

Where shown in the approved Construction Drawings, signal cable shall be installed in lieu of individual conductors.

Signal cable shall conform to the following:

a. The cable jacket shall be black polyethylene with an inner polyester binder sheath and shall be rated for 600 volts and seventy-five degrees Fahrenheit (75° F). All

cables shall have clear, distinctive, and permanent markings on the outer surface throughout the entire length of the cable showing the manufacturer's name or trademark, insulation designation, number of conductors, conductor sizes, and the voltage rating of the jacket. Filler material, if used, shall be polyethylene material.

b. Individual conductors in the cable shall be solid copper with Type THWN insulation and shall conform to the requirements in Section 86-2.08, "Conductors" of the State of California Standard Specifications and ASTM Designation: 8286. The minimum thickness of Type THWN insulation, at any point, shall be thirteen millimeters (13 mils) for conductor sizes No. 14 and No. 12, and eighteen millimeters (18 mils) for conductor size No. 10. The minimum thickness of the nylon jacket shall be four millimeters (4 mils) at any point.

c. Each signal cable shall be marked in each pull box showing the signal standard to which it is connected.

21.10 SERVICE

The new service shall conform to the following:

a. The service equipment enclosure shall be fabricated from aluminum as per Section 86-2.11 of the State of California Standard Specifications. The cabinet door shall have a two thousand pound (2,000 lb.) stress rated aluminum hasp, welded to the cabinet door.

b. Service cabinets, conduits, and pull boxes shall not be installed until the service locations have been verified by the servicing utility.

c. It shall be the Contractor's responsibility to verify the location of and make arrangements for and to pay for all costs to provide the necessary connection for the traffic signal and safety lighting service.

d. The Contractor shall install all necessary service cabinets, conduits and pull boxes to provide electrical service as the first item of construction. AFTER SERVICE HAS BEEN INSPECTED AND TAGGED BY THE CITY, the Contractor shall, within forty-eight (48) hours, request electrical service from Southern California Edison Company by phone and letter. A copy of the letter shall be sent to the Engineer.

21.11 FUNCTIONAL TESTING

The functional test for each lighting system shall consist of not less than fourteen (14) days. If unsatisfactory performance of the system develops, the conditions shall be corrected and the test shall be repeated until the fourteen (14) days of continuous, satisfactory operation is obtained.

21.12 PAINTING

All exposed metal signal sections, signal head mountings, brackets and fittings, doors, visors, backplates, pedestrian push-button housings, and pedestrian signal sections shall be powder coated by a City-approved process, in lieu of painting.

The minimum requirements are as follows:

a. A 3-5 stage pretreatment consisting of:

   i. Degrease

   ii. Rinse

   iii. Iron Phosphate

   iv. Rinse

   v. Seal

   Note: Items "i" and "iii" can be combined thereby eliminating item "c", making this a three-stage process.

b. A dry-off cycle for at least ten (10) minutes at three hundred degrees Fahrenheit (300° F) to four hundred degrees Fahrenheit (400° F).

c. Electrostatically applied powder at 75-90KV.

d. Thermal setting cycle for twenty (20) minutes at four hundred degrees Fahrenheit (400° F).

All parts shall be coated with an ultraviolet-resistant polyester powder. The only exception is for items of flat black that can be coated with a self-cleaning flat black epoxy .

Contractor shall furnish manufacturer's "Certificate of Compliance" with City-approved powder coating process prior to installation of equipment.

21.13 MODEL 170E CONTROLLER ASSEMBLIES

Model 170E controller assembly or assemblies shall be furnished by the Contractor. Controllers shall be tested and certified in accordance with Section 86-3, "Controller Assemblies" of the State of California Standard Specifications and shall be warranted for a period of one (1) year from date of "turn-on."

In addition to the provisions in Section 86-3.03, "Model 170 and Model 270 Controller Assemblies" of the State of California Standard Specifications, the complete control system, including the Model 332 cabinet, shall conform to the State of California Standard Specifications, "Traffic Signal Control Equipment Specifications" and any subsequent addenda.

The above-referenced document is available from State of California, Bids and Documents Section, in Sacramento for a fee.

The controller cabinet shall be fabricated from aluminum as specified in Section 86-3.07A of the State of California Standard Specifications.

The controller assembly shall include a pull-out shelf with internal document storage compartment mounted below the 170E controller position.

Conflict monitor shall be Model 210-P.

The Contractor shall supply the Model 170E controller. The controller unit shall be furnished complete with a Model 412C PROM module configured for Method No. 2, Memory Select No. 4. A full complement of EPROM chips shall be furnished for the controller program module. The software program will be furnished by the City. Two (2) complete manuals and four (4) complete cabinet wiring diagrams shall be supplied in accordance with the above-referenced Specifications and any subsequent addenda.

The Contractor shall provide extra equipment to the City as follows:

a. One (1) extra Model 170E controller.

The Contractor shall furnish and install all other components necessary for proper operation of the traffic signal system, including but not limited to, power supply, switch packs, and loop detector amplifiers.

The signal controller shall include a standard communications protocol which meets or exceeds the requirements of AB 3418 as specified by Caltrans. This protocol shall be selectable by the user as an alternative to the normal protocol when communications with a master supporting the AB 3418 protocol is desired. The AB 3418 protocol in the controller shall not substitute for or alter the operation of the normal communications protocol without the written approval of the Engineer. The normal communications protocol shall be the default protocol enabled on controller start up. Contractor shall certify, in writing, that the controller software complies with -AB 3418.

The protocol shall include support for uploading system detector data using the optional message defined for that purpose.

The Contractor shall arrange to have a Signal Technician, qualified to work on the control equipment and employed by the control equipment manufacturer or his representative, present at the time the equipment is turned on.

21.14 MODULATED LIGHT SIGNAL DETECTION SYSTEM

a. A Tomar 2000 Series, or better, emergency vehicle pre-emption system shall be installed. The system shall include four (4) detectors mounted on traffic signal mast arms, cable, and any other necessary hardware and/or software to operate the system. The cabinet shall include two (2), 2-channel emergency vehicle pre-emption phase selectors (discriminators) per these technical specifications.

b. The modulated light signal detection system shall conform to the Special Provisions.

c. The modulated light signal detection system shall be a Tomar 2000 Series, or approved equal. Cable shall not be spliced between controller and detector and shall be Model 138 or approved equal.

d. Detectors shall be mounted on traffic signal mast arms and shall be centered over the number one lane.

e. The Contractor shall provide extra equipment to the City as follows:

   i. One (1) extra optical detector head.

f. System Operation—The Contractor shall demonstrate that all of the components of each system are compatible and will perform satisfactorily as a system. Satisfactory performance shall be determined using the following test procedure:

   i. Each system to be used for testing shall consist of an optical emitter assembly, an optical detector, at least two hundred feet (200') of optical detector cable, and a phase selector (discriminator) module.

   ii. The phase selector (discriminator) modules shall be properly installed in the cabinet.

   iii. Two (2) tests shall be conducted; one using a Class I signal emitter and a distance of one thousand feet (1,000') between the emitter and the detector, the other using a Class II signal emitter and a distance of one thousand eight hundred feet (1,800') between the emitter and the detector. All range adjustments on the module shall be set to "Maximum" for each test.

   iv. Each above test shall be conducted for a period of one (1) hour, during which the emitter shall be operated for thirty (30) cycles, each consisting of a one (1) minute "on" interval and a one minute "off" interval. During the total test period,

      (a) The emitter signal shall cause the proper responses from the controller unit during each "on" interval

      (b) There shall be no improper operation of either the controller unit or the conflict monitor during each "off" interval.

g. Certificates and Warranties – Manufacturers' certificates and warranties shall be presented to the City inspector before traffic signal turn-on.

21.15 VEHICLE SIGNAL FACES AND SIGNAL HEADS

Signal faces, signal heads, and auxiliary equipment as shown in the approved Construction Drawings, and the installation thereof, shall conform to the provisions in Sections 86-4.01

"Vehicle Signal Faces", 86-4.03 "Backplates", and 86-4.06 "Signal Mounting Assemblies" of the State of California Standard Specifications and these Standard Specifications.

All green and yellow sections shall be provided with a Light Emitting Diode Kit that conforms to Section 22.16 of these Standard Specifications. All red sections shall be provided with a Light Emitting Diode Kit that conforms to Section 22.17 of these Standard Specifications.

Visors on vehicular signals shall be "tunnel" type with open slot at bottom.

All signal heads, housings, directional louvers, visors, and backplates shall be metallic. All vehicle signal lenses shall be twelve inches (12") in diameter.

21.16 LIGHT EMITTING DIODE GREEN AND YELLOW MODULE

All twelve inch (12") green and yellow circular sections and twelve inch (12") green and yellow arrow sections shall be provided with Type 1 LED Traffic Signal Modules.

All devices must meet the general specifications of the Transportation Electrical Equipment Specifications (TEES), Chapter 1--General Specifications, as well as these Standard Specifications. In case of conflict, these Standard Specification shall govern over the TEES, Chapter 1 Electrical Power Consumption.

Maximum power consumption requirements are as follows:

GREEN LEDs:

Temperature	77° F	166° F
12" circular	12.0 W	12.0 W
12" arrow	13.0 W	13.0 W

YELLOW LEDs:

Temperature	77° F	166° F
12" circular	22.0 W	25.0 W
12" arrow	10.0 W	12.0 W

b. Operation Voltage: The modules shall operate from a 60 HZ, ±3 HZ AC, line over a voltage ranging from 95 volts to 135 volts. The fluctuations of line voltage shall have no visible effect on the luminous intensity of the indications.

   Operating voltage of the modules shall be 120 VAC. All parameters shall measured at this voltage.

c. Power Factor: The LED signal module shall have a power factor of nine-tenths (0.90) or greater.

d. Total Harmonic Distortion (THD): Total harmonic distortion (current and voltage) induced into an AC power line by a LED signal module shall not exceed twenty percent (20%).

e. Surge Suppression: The signal module onboard circuitry shall include voltage surge protection to withstand high repetition noise transients as stated in Section 2.1.6 of NEMA Standard TS-2, 1992.

The LED circuitry shall prevent perceptible flicker to the unaided eye over the voltage range specified above.

All wiring and terminal blocks shall meet the requirements of Section 13.02, "Equipment and Material Standards" of the ITE Publication.

The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors). Review TEES Chapters 3 and 6 for specifications on these devices.

The modules and associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

f. Photometric Requirements: The minimum initial luminous intensity values for the modules shall be as defined in VTCSH Part 2, Section 4.1 at seventy-seven degrees Fahrenheit (77° F).

The modules shall meet or exceed eighty-five percent (85%) of the standard light output values found in the ITE publication: Equipment and Material Standards, VTCSH Part 2, throughout the useful life based on normal use in a traffic signal operation over the operating temperature range.

The measured chromaticity coordinates of the modules shall conform to the chromaticity requirements of VTCSH Part 2, Section 4.2, throughout the useful life over the operating temperature range.

g. Physical and Mechanical Requirements: LED traffic signal modules shall be designed as retrofit replacements for existing optical units of signal indications and shall not require special tools for installation. Type 1 modules shall be installed.

h. Environmental Requirements: The LED signal module shall be rated for use in the operating temperature range of minus forty degrees Fahrenheit (-40°F, or -40°C) to one hundred sixty-five degrees Fahrenheit (165° F, or 74°C). The modules shall meet all specifications throughout this range.

The LED signal module shall be protected against dust and moisture intrusion per the requirements of NEMA Standard 250-1991 for Type 4 enclosures to protect all internal components.

i. Construction: The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply for the module shall be integral to the unit.

The circuit board and power supply shall be contained inside the module. Circuit boards shall conform to Chapter 1, Section 6 of the "Transportation Electrical Equipment Specifications".

The assembly and manufacturing process for the LED signal assembly shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

j. Materials: Material used for the lens and signal module construction shall conform to ASTM Specifications for the materials.

Enclosures containing either the power supply or electronic components of the signal module shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

k. Module Identification: Each module shall have:

i. Manufacturer's name,

ii. Trademark,

iii. Model number,

iv. Serial number,

v. Date of manufacture (month-year), and

vi. Lot number as identification permanently marked on the back of the module.

The following operating characteristics shall be permanently marked on the back of the module: rated voltage and rated power in Watts and Volt-Ampere.

If a specific mounting orientation is required, each module shall have prominent and permanent marking(s) for correct indexing and orientation within a signal housing. The markings shall consist of an up arrow, or the word "UP" or "TOP".

l. Type 1 Traffic Signal Module: The following specification requirements apply to the Type 1 module only. All general specifications apply unless specifically superceded in this section.

Type 1 modules can be manufactured under this specification for the following faces:

i. Twelve inch (12") green circular

ii. Twelve inch (12") green arrow

m. Physical and Mechanical Requirements: The module shall fit into existing traffic signal section housings built to the specifications detailed in ITE Publication: Equipment and Material Standards, "Vehicle Traffic Control Signal Heads", with

the reflector and lamp socket remaining in place, and without modification to the housing.

Each Type 1 module shall be designed to be installed in the door frame of a standard traffic signal housing. The Type 1 module shall be sealed in the door frame with a one-piece EPDM (ethylene propylene rubber) gasket.

The maximum weight of a Type 1 module shall be one and eight tenths kilograms (1.8kg, or four pounds).

n. Construction: Each Type 1 module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a green lens and gasket, etc.), and shall be weather proof after installation and connection.

o. Conductors: Two (2) secured, color coded, nine hundred fourteen millimeter (914 mm, or thirty-six inch) long, 600 V, twenty gauge (#20) minimum, jacketed wires, conforming to the National Electric Code, rated for service greater than two hundred twenty degrees Fahrenheit (220° F), are to be provided for electrical connection for each Type 1 LED signal module. Conductors for Type 1 modules shall be one meter (1m) in length, with quick disconnect terminals attached and shall conform to Section 86-4.01C, "Electrical Components" of the State of California Standard Specifications.

If specified in the purchased order, the module will be equipped with an adapter that will screw into the medium base, lamp socket. The adapter shall be able to accept the quick disconnect terminals at the end of the conductors for the module. The electrical contacts of the adapter shall be made of brass.

p. Lens: The lens of the Type 1 module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.

The lens may be tinted or may use transparent film or materials with similar characteristics to enhance ON/OFF contrasts.

The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.

The LED signal module lens shall be UV stabilized and shall be capable of withstanding ultraviolet (direct sunlight) exposure for a minimum period of forty-eight (48) months without exhibiting evidence of deterioration. If a polymeric lens is used, a surface coating or chemical surface treatment shall be used to provide front surface abrasion resistance.

q. 12" Arrow: The following specification requirements apply to the twelve inch (12") arrow module only. All general specifications apply unless specifically superseded in this Section.

   i. The arrow module shall meet specifications stated in the VTCSH Section 9.00 for arrow lenses.

ii. The LEDs shall be spread evenly across the illuminated portion of the arrow area.

iii. Each module shall provide an average luminous intensity of at least five thousand five hundred candela per square meter (5,500 cd/m^2) throughout the useful life over the operating temperature range. Arrow modules shall be tested as per California Test 3001.

r. Quality Assurance:

The modules shall be manufactured in accordance with a manufacturer quality assurance (QA) program. The QA program shall include two (2) types of Quality Assurance:

i. Design quality assurance

ii. Production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of The modules built to meet this specification, and a documented process of how problems are to be resolved.

QA process and test results documentation shall be kept on file for a minimum period of seven (7) years.

LED signal module designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

s. Production Quality Control Testing: The following Production Quality Assurance tests shall be performed on each new module prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. Test results shall be retained by the manufacturer for seven (7) years.

i. Burn-in period shall consist of each signal module being energized at rated voltage for a thirty (30) minute stabilization period before the measurement is made.

ii. Each module shall be tested for rated initial intensity after burn-in.

iii. A single point measurement, with a correlation to the intensity requirements of Section 1.04 of the VTCSH for circular modules, may be used.

iv. The ambient temperature for this measurement shall be greater than seventy-seven degrees Fahrenheit (77° F). Each module not meeting minimum luminous intensity requirements per Table 1 of VTCSH for circular modules, eleven thousand candela per square meter (11,000 cd/m^2) for arrow modules, or three thousand seven hundred fifty candela per square meter (3,750 cd/m^2) for pedestrian modules shall be cause for rejection.

v. Each module shall be tested for required power factor after burn-in.

vi. Each module shall be measured for current flow in amperes after burn-in. The measured current values shall be compared against rated values resulting from design qualification measurements. The current flow shall not exceed the rated value.

vii. Each module shall be visually inspected for any exterior physical damage or assembly anomalies. Careful attention shall be paid to the surface of the lens to ensure there are no scratches (abrasions), cracks, chips, discoloration, or other defects. Any such defect shall be cause for rejection.

t. Warranty:

The manufacturer shall provide a written warranty against defects in materials and workmanship for the modules for a period of sixty (60) months after acceptance of the modules. Replacement modules shall be provided promptly after receipt of modules that have failed at no cost to the City. All warranty documentation shall be given to the City prior to random sample testing.

21.17 LIGHT EMITTING DIODE KIT RED MODULE

All signal sections and pedestrian signals shall be provided with a Light Emitting Diode (LED) Kit. The LED kit shall replace the reflector, socket, gasket, and lens assembly of the incandescent signal face as specified in Section 86-4.05 "Vehicle Signal Faces" of the State of California Standard Specifications. Each retrofit unit shall consist of a convex smooth red polycarbonate ultraviolet stabilized lens, LED circuit board, constant current type power supply, a molded rear housing and EPDM gasket for retaining the assembly in the door of the signal section. The installed unit shall be watertight.

The LEDs shall utilize AllnGaP technology and shall be the ultra bright type rated for a minimum of one-hundred thousand (100,000) hours of continuous operation (nominal current and seventy-seven degrees Fahrenheit). The minimum operation range of the unit shall be from seventy-seven degrees Fahrenheit (77º F) to one hundred fifty-eight degrees Fahrenheit (158º F). The LED emission spectrum shall be six hundred sixty nanometers (660 nm) nominal. The viewing angle of the mounted unit shall not be less than thirty degrees (30°).

The Led signal module shall provide a power factor of nine tenths (0.90) or better.

Total harmonic distortion (current and voltage) induced into an AC power line by a LED signal module shall not exceed twenty percent (20%).

The operating voltage range of the unit shall be between 92 VAC and 125 VAC. Fluctuations of line voltage shall have a minimal effect on the luminous intensity of the indication. The units shall be compatible with Conflict Monitors utilizing Red Monitoring without the installation of any external components. The burnout of any single LED shall not result in the loss of the entire indication.

Nominal power consumption of a twelve inch (12") ball indication shall be less than thirty watts (30w). Nominal power consumption of a twelve inch (12") arrow indication shall be less than twenty watts (20w).

The rated luminous output of each LED and the number of LEDs installed in each unit shall be sufficient to meet or exceed the most recent ITE specifications. A "Statement of Compliance" from a third party testing facility shall be supplied to the City.

For twelve inch (12") ball indications, the minimum number of LEDs shall be six hundred (600). For the twelve inch (12") arrow indications, the minimum number of LEDs shall be two hundred fifty (250). Units utilizing an optical component may have fewer LEDs. The LEDs shall be spaced in a uniform pattern throughout the indication.

a. Certificate of Compliance: The Contractor shall provide the Engineer with a "Certificate of Compliance" from the manufacturer in accordance with the provisions of Section 6.03 "Certificates of Compliance" of these Standard Specifications. The certificate shall certify that the LED signal modules comply with the requirements of these Standard Specifications. The certificate shall also include a copy of applicable test reports on the LED signal modules.

b. Warranty: The manufacturer shall provide a written warranty against defects in materials and workmanship for the LED signal modules for a period of sixty (60) months after installation of the modules. Replacement modules shall be provided promptly after receipt of modules that have failed at no cost to the City of Visalia except cost of shipping of the failed modules. Warranty documentation shall be given to the Engineer prior to installation.

21.18 PEDESTRIAN SIGNALS

a. Pedestrian signals shall be Type C, except that solid-state controllers shall be used in lieu of transformers.

b. Both the "Upraised Hand" and "Walking Person" shall use light emitting diode (LED) as the light source in lieu of an incandescent lamp for use in pedestrian signal faces.

c. The installation shall not require any special tools or the drilling of any holes in the reflector or housing.

d. The luminous intensity, quantity and color of the LEDs shall be such that the intent of the current ITE specification for Pedestrian Traffic Control Signal Indications is satisfied.

e. The unit shall have a maximum power consumption of fifteen watts (15w) at 120 VAC. The unit shall operate between 92 VAC and 125 VAC and from seventy-seven degrees Fahrenheit (77º F) to one hundred fifty-eight degrees Fahrenheit (158º F).

f. Each assembly shall consist of a minimum of two hundred twenty-five (225) LEDs arranged in minimum of 3 strings. The loss of a single LED shall result in a loss of only that string.

g. LED pedestrian signal face "Upraised Hand & Walking Person" module shall be designed to mount in the standard existing Type A housing. Pedestrian signal face modules shall be designed to mount behind or replace the existing face plate of existing Type A housing as specified by the requirements of the ITE Standards "Pedestrian Traffic Control Signal Indications" and the MUTCD. The design of the modules shall require a specific mounting orientation.

21.19 DETECTORS

a. Vehicle detectors shall be Type E as indicated in the approved Construction Drawings, and shall conform to the applicable provisions of Section 86-5 "Detectors" of the State of California Standard Specifications. Loops shall be cut into pavement and installed on the same day. This shall include placement of loops and asphaltic concrete sealant.

b. Loop wire shall be Type 1.

c. Loop detector lead-in cable shall be Type C.

d. The sides of the slot shall be vertical, and the minimum radius of the slot entering and leaving the circular part of the loop shall be one and one-half inches (1½"). Slots in asphalt concrete pavement shall be filled with asphaltic concrete sealant as follows:

   i. After conductors are installed in the slots cut in the pavement, paint binder shall be applied to all vertical surfaces of slots in accordance with the provisions in Section 39-4.02, "Prime Coat and Paint Binder" of the State of California Standard Specifications.

   ii. Temperature of sealant material during installation shall be above seventy degrees Fahrenheit (70° F). Air temperature during installation shall be above fifty degrees Fahrenheit (50° F). Sealant placed in the slots shall be compacted by use of an eight inch (8") diameter by one-eighth of one inch (⅛") thick steel hand roller or other tool approved by the Engineer. Compacted sealant shall be flush with the pavement surface. Minimum conductor coverage shall be one inch (1"). Excess sealant remaining after rolling shall not be reused. On completion of rolling, traffic will be permitted to travel over the sealant.

e. Conductors for each inductive loop detector shall be continuous and unspliced from the pull box adjacent to the loop to the field terminals in the cabinet.

21.20 PEDESTRIAN PUSH BUTTONS

Pedestrian push-button assemblies shall comply with the Architectural and Transportation Barriers Compliance Board Interim Final Ruling on the Americans with Disabilities Act Accessibility Guidelines and the following requirements:

a. The housing for the unit shall be made of 356 Aluminum heat treated to meet Specificaion T-6. It shall be of a telescoping, vandal-proof design. The color shall be black matching color #17038, #27038, or #37038 of Federal Standard #595B.

b. The plunger/actuator surface shall have a diameter of two inches (2") or greater. It shall be made of polished stainless steel and assembled with all stainless steel components so as not to be corrosive. The actuator shall be conical in shape with the cone extending four hundred four thousandths of one inch (.404") above the bezel of the switch housing in the neutral position.

c. The microswitch component shall be a dust-proof, water-resistant type. It shall be a single-pole, precision, snap-acting type. It shall also be UL listed and CSA Certified and meet the requirements for NEMA TS-1 and TS-2.

d. The complete switching unit shall have an operating force of three pounds (3 lbs.) and a minimum release force of three pounds (3 lbs.). Pre-travel shall be sixty-two thousandths of one inch (0.062") minimum. Over-travel shall be sixty-two thousandths of one inch (0.062") minimum.

e. Units shall permit recessed mounting in existing standard type pedestrian push-button assemblies without modification.

21.21 SAFETY AND STREET LIGHTING

a. Luminaires used for safety shall be GE #M2AC (200 Watt) S7HGMC31 or equal. A twist-Iock photo-electrical control unit and receptacle shall be installed on each luminaire.

b. All luminaires to be mounted on horizontal mast arms, when tested in accordance with California Test 611, shall be capable of withstanding cyclic loading in:

   i. A vertical plane at a minimum peak acceleration level of 3.0 g's peak-to-peak sinusoidal loading (same as 1.5 g's peak) with the internal ballast removed for a minimum of two million cycles without failure of any luminaire parts, and

   ii. A horizontal plane perpendicular to the direction of the mast arm at a minimum peak acceleration level of 1.5 g's peak-to-peak sinusoidal loading (same as 0.75 g's peak) with the internal ballast installed for a minimum of two million cycles without failure of any luminaire parts.

c. No part of the slipfitter mounting brackets on the luminaires shall develop a permanent set in excess of two hundredths of one inch (0.02") when the four (4) three-eighths of one inch (⅜") diameter cap screws used for mounting are tightened to a torque of ten foot pounds (10 ft lbs).

d. Ballasts shall be the lag regulator type.

e. Each light shall have a fuse protection located in the pull box next to the lighting standard.

21.22 REMOVING, REINSTALLING, OR SALVAGING ELECTRICAL EQUIPMENT

Salvaged traffic signal equipment and electrical materials shall be hauled to City of Visalia Corporation Yard and stockpiled, unless noted otherwise in the approved Construction Drawings.

21.23 TRAFFIC SIGNAL STREET NAME SIGNS

The Contractor shall furnish and install Traffic Signal Street Name Signs and sign mounting brackets as shown in the approved Construction Drawings or per the City of Visalia Engineering Improvement Standards and described below. The signs and sign mounting brackets shall be manufactured in accordance with the specifications, drawings, and lists detailing information.

a. Reflective Materials: Sheeting material, letters, and border materials shall be Diamond Grade LDP (long distance performance) manufactured by 3M Co. NO SUBSTITUTES will be permitted.

   All letters and border material shall be white in color similar to 3M Co. #3970. Background color shall be green similar to 3M Co. #3977. Only die-cut material shall be used for the letters and border material. No silk-screening of signs will be allowed.

   Spacing of all letters shall be in accordance with sheeting manufacturer's recommended standard so as to achieve optimum legibility and uniformity under both day and night conditions.

b. Blade Structure: All aluminum sign blanks shall be 6061-T6 Alloy or 5052H38, eight-hundredths of one inch (0.080") in thickness.

   Dimensions of sign blanks shall be forty-eight inches (48") minimum to eighty-four inches (84") maximum wide by eighteen inches (18") high. No splices of sign blanks shall be permitted.

   Each sign shall have a one and one-fourth inches by one and one-forth inches by one-eighth of one inch (1¼"x1¼"x⅛") aluminum angle as stiffeners. One near the top and one near the bottom of the sign. Space between the stiffeners shall be fifteen and three-fourths inches (15¾") outside to outside and centered on the sign. Stiffeners shall be fastened to the sign, with legs of aluminum angle pointing toward the center of the sign, using three-sixteenths of one inch ($^{3}/_{16}$") rivets placed on six inch (6") centers. No rivet shall be placed closer than one inch (1") nor more than two inches (2") from the edge of the sign. All stiffeners shall be equal in length to the sign. Stiffeners shall be installed after face material has been applied to the aluminum sign blank.

   Each stiffener shall have two (2) three-eighths of one inch (⅜") diameter holes spaced four and seven-eighths inches (4⅞") apart. The holes shall be centered on a point one-third (⅓) of the way from the right-hand edge of the sign when facing the legend. Holes shall match those in the sign mounting bracket.

c. Sign Mounting Bracket: Material used to manufacture sign bracket shall be twelve gallons (12gal), hot-rolled sheet steel, low carbon, commercial quality, specification QQS-663, grade 1010. Bracket shall be hot-dip galvanized after fabrication per specification ASTM-A-123_68.

Tolerances shall be plus or minus one thirty-seconds of one inch ($^{1}/_{32}$"), for angles plus or minus zero degrees to thirty minutes (±0d30'00").

Four (4) five-sixteenths of one inch (5/16") – thirteen inches by one and one-half inche (13"x1½") bolts with proper nuts and one (1) lock washer per bolt shall be provided as part of the sign mounting bracket.

d. Quality of Work: All signs fabricated shall conform to the manufacturer of sheeting, letters, and borders application methods. All signs shall be free of wrinkles, cracking, crazing, or blistering upon delivery to the City.

Satisfactory performance of reflective quality of fabricated signs shall be as follows:

i. Minimum Initial Retroreflectivity Brightness
ii. Candelas per foot candle per square foot
iii. (0.2 deg obs. and -4 deg entrance)

Color	M.I.R.B.
White	800
Green	80

The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that:

i. The sign is ineffective for its intended purpose when viewed from a moving motor vehicle under normal day and night driving conditions; or

ii. The coefficient of retroreflection is less than the minimum specified.

All signs shall be date stamped, at the time of fabrication as per manufacturer's requirements to verify guarantee period. Any sign not so marked shall be replaced at the manufacturer's expense.

Traffic signal street name signs shall be strapped to the signal poles at a height of sixteen feet (16') to the bottom of the sign by the use of three-fourths of one inch (¾") wide, three-tenths of one inch (0.030") thick, AISI Type 201 stainless steel strapping. Strapping shall be placed at the three (3) locations provided by the slots in the mounting bracket. Buckles used shall be designed for three-tenths of one inch (0.030") stainless steel banding. City will supply street name sign and mounting bracket. Contractor is to provide strapping and strapping hardware.

21.24 TRAFFIC SIGNAL BATTERY BACK-UP SYSTEM

a. General: This specification establishes the minimum requirements for a complete emergency battery backup system for use with Light Emitting Diode (LED) Traffic Signal Modules. The battery backup system (BBS) shall include, but not be limited to the following:

   i. Inverter/charger,

   ii. Power transfer relay,

   iii. Batteries,

   iv. A separate manually operated non-electronic bypass switch and

   v. All necessary hardware and interconnect wiring.

   The BBS shall provide reliable emergency power to a traffic signal system (Vehicle and Pedestrian Traffic) in the event of a power failure or interruption.

   The BBS shall be capable of providing power for full run-time operation for an "LED-only" intersection (all colors: red, yellow, green and pedestrian heads) or flashing mode operation for an intersection using Red LED's.

   The BBS shall be designed for outdoor applications, in accordance with the Caltrans Transportation Electrical Equipment Specifications (TEES), Chapter 1, Section 8 Requirements.

b. Operation: The BBS shall provide a minimum two (2) hours of full run-time operation for an "LED-only" intersection (minimum 700W/1000VA active output capacity, with eighty percent (80%) minimum inverter efficiency).

   The maximum transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, shall be sixty-five milliseconds (65ms). The same maximum allowable transfer time shall also apply when switching from inverter line voltage to utility line voltage.

   The BBS shall provide the user with three (3) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) dry relay contact closures, available on a panel-mounted terminal block, rated at a minimum 120V/1A, and labeled so as to identify each contact. For typical configuration, see Figure 3(b).

   i. The first set of NO and NC contact closures shall be energized whenever the unit switches to battery power. Contact shall be labeled or marked "On Batt."

   ii. The second set of NO and NC contact closures shall be energized whenever the battery approaches approximately forty percent (40%) of remaining useful capacity. Contact shall be labeled or marked "Low Batt."

iii. The third set of NO and NC contact closures shall be energized two hours after the unit switches to battery power. Contact shall be labeled or marked "Timer"

Operating temperature for both the inverter/charger, power transfer relay and manual bypass switch shall be minus thirty-five degrees Fahrenheit (-35° F) to one hundred sixty-six degrees Fahrenheit (166° F).

Both the Power Transfer Relay and Manual Bypass Switch shall be rated at 240VAC/30 amps, minimum.

The BBS shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 - 4.0 mV/°C per cell.

The temperature sensor shall be external to the inverter/charger unit. The temperature sensor shall come with two meters (2m, or six feet six inches) of wire.

Batteries shall not be recharged when battery temperature exceeds one hundred twenty-two degrees Fahrenheit, plus or minus thirty-eight degrees (122° F ± 38°).

BBS shall bypass the utility line power whenever the utility line voltage is outside of the following voltage range: 100VAC to 130VAC (± 2VAC).

When utilizing battery power, the BBS output voltage shall be between 110 VAC and 125 VAC, pure sine wave output, three percent (3%) THD, 60Hz ± 3Hz.

BBS shall be compatible with Caltrans Model 332 Cabinets, Model 170 Controllers, Model 2070 Controllers and cabinet components for full time operation.

When the utility line power has been restored at above 105 VAC ± 2 VAC for more than thirty (30) seconds, the BBS shall transfer from battery backed inverter mode back to utility line mode.

BBS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.

In the event of inverter/charger failure, battery failure or complete battery discharge, the power transfer relay shall revert to the NC (and de-energized) state, where utility line power is connected to the cabinet.

Recharge time for the battery, from "protective low-cutoff" to eighty percent (80%) or more of full battery charge capacity, shall not exceed twenty (20) hours.

c. Mounting / Configuration

i. General: Inverter/Charger Unit shall be rack or shelf-mounted.

Power Transfer Relay and Manual Bypass Switch shall be mounted on the 332 Cabinet standard Electronic Industries Association (EIA) rail.

All interconnect wiring provided between Power Transfer Relay, Bypass Switch and Cabinet Terminal Service Block shall be no less than two meters (2m, or six feet six inches) of ten gauge (#10) wire.

Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be two meters (2m, or six feet six inches) of eighteen gauge (#18) wire.

See Figure 4 that provides clarification as to how BBS Power Transfer Relay and Manual Bypass Switch are interconnected with Model 332A Cabinets in order to ensure interchangeability between all BBS manufacturers.

All necessary hardware for mounting (shelf angles, rack, etc) shall be included in the bid price of the BBS. A minimum of six (6) bolts/fasteners shall be used to secure swing-trays to the 332 Cabinet Standard EIA four hundred eighty two and six-tenths millimeters (482.6mm, or 19") rack. All bolts/fasteners and washers shall meet the following requirements:

(a) Screw type: Pan Head Phillips machine screw,

(b) Size and Thread pitch: 10-32,

(c) Material: 18-8 stainless steel (Type 316 stainless steel is acceptable as an alternate),

(d) Washer: Use one (1) flat washer (18-8 stainless steel) under the head of each 10-32 screw (provided that the screws are properly tightened, lock washers are unnecessary),

(e) Number of screws per swivel bracket, minimum: six (6) screws per swivel bracket. Spaced evenly along bracket, with one (1) screw near each end.

ii. Internal mounted battery option: Not allowed .

iii. External battery cabinet option:

(a) Inverter/Charger, Power Transfer Relay and manually operated Bypass Switch shall fit inside a typical fully equipped Caltrans Model 332 Cabinet that includes one (1) Model 170.

(b) Batteries shall be housed in a NEMA 3R rated cabinet mounted to the side of the Model 332 Cabinet. This external battery cabinet shall conform to TEES, March 29, 2002 Chapter 7, Section 2-Housings for the construction and finish of the cabinet.

(c) Batteries shall be mounted on individual shelves.

(d) Four (4) shelves shall be provided. There shall be a minimum of three hundred four and eight-tenths millimeters (304.8mm, or 12") clearance between shelves. Each shelf shall be a minimum of two hundred twenty

eight and six tenths millimeters by six hundred thirty five millimeters (228.6mm x 635.0mm, or 9" x 25"), and capable of supporting a minimum of fifty-seven kilograms (57kg, or 125 lbs.)

(e) The external battery cabinet shall mount to the Model 332 Cabinet with a minimum of eight (8) bolts. (See Figure 5)

(f) The external battery cabinet shall be ventilated through the use of louvered vents, filter, and one thermostatically controlled fan as per TEES Chapter 7 Section 2-Housings.

(g) External battery cabinet fan shall be AC operated from the same line output of the Manual Bypass Switch that supplies power to the 332 Cabinet.

(h) The external battery cabinet shall have a door opening to the entire cabinet. The door shall be attached to the cabinet through the use of either a continuous stainless steel piano hinge or four (4), two-bolts per leaf, hinges as per TEES Chapter 7, Section 2. The door shall use a padlock clasp or latch and lock mechanisms as described in the TEES, in order to lock the door.

(i) The BBS with external battery cabinet shall come with all bolts, conduits and bushings, gaskets, shelves, and hardware needed for mounting.

iv. <u>Maintenance, displays, controls, and diagnostics:</u>

(a) The BBS shall include a display and /or meter to indicate current battery charge status and conditions.

(b) The BBS shall have lightning surge protection compliant with IEEE/ANSI C.62.41.

(c) The BBS shall be equipped with an integral system to prevent battery from destructive discharge and overcharge.

(d) The BBS and batteries shall be easily replaced with all needed hardware and shall not require any special tools for installation.

(e) The BBS shall include a front-panel event counter display to indicate the number of times the BBS was activated and a front-panel hour meter to display the total number of hours the unit has operated on battery power. Both meters shall have push button resets.

(f) Manufacturer shall include a set of equipment lists, Operation and Maintenance (O&M) Manuals, and board-level schematic and wiring diagrams of the BBS, and the battery data sheets. Manual shall conform to TEES March 29, 2002, Chapter 1, Section 1.2.4.2.

v. Battery system:

(a) Individual batteries shall be 12V type, 65 amp-hour maximum, and shall be easily replaced and commercially available off the shelf.

(b) Batteries used for BBS shall consist of four to eight (4-8) batteries with a cumulative minimum rated capacity of 240 amp-hours.

(c) Batteries shall be deep cycle, sealed prismatic lead-calcium based AGM/VRLA (Absorbed Glass Mat/ Valve Regulated Lead Acid).

(d) Batteries shall be certified by the manufacturer to operate over a temperature range of minus thirteen degrees Fahrenheit (–13° F) to one hundred sixty-six degrees Fahrenheit (166° F).

(e) The batteries shall be provided with appropriate interconnect wiring and corrosion-resistant mounting trays and/or brackets appropriate for the cabinet into which they will be installed.

(f) Batteries shall indicate maximum recharge data and recharging cycles.

(g) Battery interconnect wiring shall be via modular harness. Batteries shall be shipped with positive and negative terminals pre-wired with red and black cabling that terminates into a typical power-pole style connector. Harness shall be equipped with mating power-pole style connectors for batteries and a single, insulated plug-in style connection to inverter/charger unit. Harness shall allow batteries to be quickly and easily connected in any order and shall be keyed and wired to ensure proper polarity and circuit configuration.

(h) Battery terminals shall be covered and insulated so as to prevent accidental shorting.

vi. Quality assurance:

(a) Each BBS shall be manufactured in accordance with a manufacturer Quality Assurance (QA) Program. The QA program shall include two (2) Quality Assurance procedures:

(i) Design QA (see vii below) and

(ii) Production QA. The Production QA shall include statistically controlled routine tests to ensure minimum performance levels of BBS units built to meet this specification and a documented process of how problems are to be resolved.

(b) QA process and test results documentation shall be kept on file for a minimum period of seven (7) years.

(c) Battery Backup System designs not satisfying Design QA Testing and Production QA Testing requirements shall not be labeled, advertised, or

sold as conforming to this specification.

vii. Design qualifications testing:

(a) The manufacturer, or an independent testing lab hired by the manufacturer, shall perform Design Qualification Testing on new BBS system(s) offered, and when any major design change has been implemented on an existing design. A major design change is defined as any modification, either material, electrical, physical or theoretical, that changes any performance characteristics of the system, or results in a different circuit configuration. Where a dispute arises in determining if a system is a new design or if the system has had a major design change, the State will make the final determination if Design Qualification Testing is required prior to production consideration.

(b) A quantity of two (2) units for each design shall be submitted for Design Qualification Testing.

(c) Test units shall be submitted to Caltrans TransLab, Electrical Testing Branch after the manufacturer's testing is complete.

(d) Manufacturer's testing data shall be submitted with test units for Caltrans verification Design Qualification Testing.

viii. Burn in:

(a) The sample systems shall be energized for a minimum of five (5) hours, with full load of 700 watts, at temperatures of minus thirty-five degrees Fahrenheit (–35° F) and one hundred sixty-six degrees Fahrenheit (166° F), excluding batteries, before performing any design qualification testing.

(b) Any failure of the BBS, which renders the unit non-compliant with the specification after burn in, shall be cause for rejection.

(c) For Design Qualification Testing, all specifications will be measured including, but not limited to:

(i) Run time while in battery backup mode, at full load.

(ii) Proper operation of all relay contact closures ("On-Batt", "Low-Batt" and "Timer").

(iii) Inverter output voltage, frequency, harmonic distortion, and efficiency, when in battery backed inverter mode.

(iv) All power transfer voltage levels. See BBS Specifications 1.8, 1.11 and 1.12.

(v) Power transfer time, from loss of utility line voltage to stabilized inverter line voltage, from batteries.

(vi) Backfeed voltage to utility when in battery backed inverter mode.

(vii) IEEE/ANSI C.62.41 compliance.

(viii) Battery charging time.

(ix) Event counter and runtime meter accuracy.

ix. Production quality control testing:

(a) Production Quality Control tests shall consist of all of the above listed tests and shall be performed on each new system prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. The manufacturer shall retain test results for seven (7) years.

(b) Each BBS shall be given a minimum one hundred (100) hour burn in period to eliminate any premature failures.

(c) Each system shall be visually inspected for any exterior physical damage or assembly anomalies.

(d) Any defects shall be cause for rejection.

21.25 TRAFFIC SIGNAL INTERCONNECT CONDUIT

a. The lump sum price for traffic signal installation and hardware shall include the cost of furnishing and installing conduit, for a future traffic signal interconnect, of the sizes specified in the approved Construction Drawings in a trench in the street at the depth required by either the approved Construction Drawings, these Standard Specifications, or the Special Provisions; and all work associated with conduit installation including, but not limited to, protection of existing traffic detection, Type 6E pull boxes, backfilling, paving, and providing sweeps into pull boxes.

b. Installation of all equipment, materials, and components for traffic signal interconnect system, pursuant to the provisions of the State of California Standard Specifications, State Standard Plans, these Standard Specifications, and the Special Provisions.

c. All conduits shall be rigid metal type or electric grey, schedule 40 PVC.

d. When a standard coupling cannot be used for coupling metal type conduit, a UL-listed threaded union coupling, as specified in the third paragraph in Section 86-2.05C "Installation" of the State of California Standard Specifications, or a concrete-tight split coupling or concrete-tight set screw coupling shall be used.

e. All conduit runs into pull boxes shall have a forty-five degree (45°) sweep.

f. Installation of Type 6E pull boxes shall include the cost of furnishing and installing each new Type 6E pull boxes within the interconnect system as specified in the

approved Construction Drawings and the Special Provisions and all work associated with installation of said pull boxes.

g. Grout shall be placed in bottom of standard pull boxes. Cover markings shall be per Caltrans Standard Plan ES-8 except that the word "Caltrans" shall be omitted. Pull boxes not protected by curb shall be traffic bearing.

h. The Contractor shall install pull ropes in all traffic signal interconnect conduit.

i. Protection and restoration of existing improvements shall comply with Section 7.13 "Preservation of Property" of these Standard Specifications.

j. The Contractor shall be responsible for the protection of public and private property adjacent to the work and shall exercise due caution to avoid damage to such property.

k. The Contractor shall contact USA to request marking of all utilities in the project area. The Contractor shall determine the exact location and depth of all potentially conflicting utilities or other improvements, prior to doing any work that could potentially interfere with or damage such facilities. This applies to any utility marked via USA, utilities shown on any sheet of the approved Construction Drawings, or whose presence can be inferred from conditions visible or evident at the job site, including markings, meters, trenches, manholes, handholes, pedestals, structures, valves, or buildings. Where possible, the location of the conduit and pull boxes shall be adjusted in the field to avoid conflicts with any utilities.

l. The Contractor is required to submit to the Engineer "Record Drawings" prints, prior to the City's accepting the installations. The prints shall indicate in red all deviations from the approved Construction Drawings such as location of poles, pull boxes and runs, depths of conduit, number of conductors and other appurtenant work for future references.

m. Full compensation for labor, material, equipment, pull boxes, sweeps, bends, hardware, backfill, paving, and appurtenances required for the installation of traffic signal interconnect conduit shall be included in the lump sum price paid for the traffic signal installation and hardware and no separate payment will be made, therefore.

21.26 MEDIAN LIGHTING

a. The contract, lump sum price paid for median lighting, shall include full compensation for furnishing all labor, materials, tools, equipment, conduits, pull boxes, trenching and incidentals and for doing all the work involved in median lighting, complete in-place, including providing the electrical service, as shown in the approved Construction Drawings, as specified in these Standard Specifications and the Special Provisions, and as directed by the Engineer.

b. Description: Install all equipment, materials, and components for traffic signals and highway safety lighting system, pursuant to the provisions of the State of California

Standard Specifications, Section 86 "Signals, Lighting, and Electrical Systems", State Standard Plans, and these Standard Specifications..

c. Foundations: Portland cement concrete shall conform to Section 90-10, "Minor Concrete," of the State of California Standard Specifications and shall contain not less than four hundred seventy pounds (470 lbs) of cement per cubic yard.

d. Safety and Street Lighting: Luminaries used for safety and street lighting shall be GE M2AC15S7H2GMC31 or equal. A twist-lock photo-electrical control unit and receptacle shall be installed on each luminaire. Luminaire to be provided by the Contractor, and installed by the Contractor.

e. All Luminaires to be mounted on horizontal mast arms, when tested in accordance with California Test 611, shall be capable of withstanding cyclic loading in:

   i. A vertical plan at a minimum peak acceleration level of 3.0 g's peak-to-peak sinusoidal loading (same as 1.5 g's peak) with the internal ballast removed for a minimum of two million cycles without failure of any luminaire parts, and

   ii. A horizontal plan perpendicular to the direction of the mast arm at a minimum peak acceleration level of 1.5 g's peak-to-peak sinusoidal loading (same as 0.75 g's peak) with the internal ballast installed for a minimum of two million cycles without failure of any luminaire parts.

f. No part of the slipfitter mounting brackets on the luminaries shall develop a permanent set in excess of two hundredths of one inch (0.02") when the four (4) three-eighths of one inch (⅜") diameter cap screws used for mounting are tightened to a torque of ten foot pounds.

g. Ballast's shall be the lag regulator type.

h. Lamps used in safety lighting luminaries shall be as specified on the approved traffic signal Construction Drawings.

i. Lamps used in street lighting shall conform to Section 86-6 of the State of California Standard Specifications and be 150 watts, 240-volt, high-pressure sodium, and operate at 16,000 lumens, unless stated otherwise in the approved Construction Drawings.

j. Each light shall have a fuse protection located in the pull box next to the lighting standard.

k. Standards used for street lighting shall be pre-stressed concrete octagonal pole equal to the Ameron 1C1 Series. Pole length shall be twenty-five feet and nine inches (25' -9"). Pole finishes shall be blasted black and white aggregates with no protective coating. Concrete lighting poles shall be ordered as double arm as shown in the approved Construction Drawings.

l. Luminaire arms shall be eight feet (8') long. Material shall be of Carson-Steel sheets and strip structural quality, ASTM Designation: A750, Grade C. Arm

mounted on poles shall be perpendicular to street.

m. Material:

i. Pull boxes: Christy N30 (Caltrans No. 5) or approved equal with a twelve inch (12") extension.

ii. Light standards:

(a) Pole length - twenty five feet and nine inches (25' -9")

(b) Arm length - eight feet (8') (double mast arm)

(c) Pole - Ameron Series 1C1 pre-stressed concrete pole

n. Payment: Full compensation for furnishing all labor, equipment, and tools for doing all work in performing the requirements and specifications herein shall be considered as included in the contract lump sum for median lighting, conduits, pull boxes, and electrical services and no additional compensation will be allowed therefore.

i. Full compensation for hauling and stockpiling electrical material including excavation necessary for bases shall be considered as included in the contract lump sum for median lighting, conduits, pull boxes, and electrical service and no additional compensation will be allowed therefore.

ii. Full compensation for all conductor including pull rope necessary and associate with the street lights, pull boxes, electrical boxes, boring, circuit and breakers to complete the project to working order shall be considered as included in the contract lump sum price paid for median lighting, conduits, pull boxes, and electrical service and no additional compensation will be allowed therefore.

iii. Full compensation to provide and install the electrical service pedestal and coordination with Southern California Edison shall be considered as included in the contract lump sum price paid for median lighting conduits, pull boxes and electrical service and no additional compensation will be allowed therefore.

21.27 PAYMENT

Full compensation for the items described in Section 22 of these Standard Specifications and any other work necessary for completion of the work not specifically described in the approved Construction Drawings or these Standard specifications, complete in place, as shown in the approved Construction Drawings, as specified in these Standard Specifications and the Special Provisions, and as directed by the Engineer shall be considered as included in the contract lump sum price paid for "Traffic Signal Installation and Lighting" and no additional compensation will be allowed therefore.

Note: Key all locks to match standard City keys. Controller cabinet lock shall match standard City controller cabinet key. Police panel lock shall match standard City police panel key. Battery back up cabinet lock shall match controller cabinet key.

SECTION 22 – WATER SERVICE

22.01 MATERIALS

a. Ductile Iron (DI) Pipe: All Ductile Iron pipe shall comply with the latest revision of American Water Works Association (AWWA) Standard C151 and shall be cement mortar lined in conformance with the latest revision of AWWA Standard C104. All pipe shall have push-on joint ends complete with gasket unless specified otherwise and shall be Pressure Class 350 in all sizes from six inches (6") to twelve inches (12") unless specified otherwise. Pipe shall be furnished with polyethylene encasement complying with the latest revision of AWWA Standard C105. All pipe shall be manufactured by Pacific States, Clow/McWane, U.S. Pipe, or Griffin pipe.

b. Polyvinyl Chloride (PVC) Pipe: All pipe shall be Class 150, D.R. 18, unless otherwise specified and shall comply with the latest revision of AWWA Standard C-900. The pipe shall have ductile-iron pipe equivalent outside diameter dimensions and shall have push-on joint ends complete with gaskets. All pipe shall be manufactured by PW pipe, J-M Pipe, CertainTeed, Diamond Plastic Corp., Vinyl Tech, Uponor, or Royal Pipe.

c. Cement Mortar Lined and Cement Mortar Coated Steel Pipe (CL&C): All cement mortar lined and coated steel pipe shall be fabricated from steel cylinder ASA schedule as indicated on the drawing, with American Society for Testing and Materials (ASTM) A53 test pressure and ASTM A36 physical properties. Cement mortar protective coating shall be three-fourths of one inch (¾") for all pipe sizes. The lining shall be one-half of one inch (½") for twelve inch (12") and larger pipe and three-eighths of one inch (⅜") for six inch (6") and eight inch (8") pipe, and conform to the latest revision of AWWA C205 Standard. Cement Mortar Coating shall be reinforced with fourteen gauge (#14) wire mesh or spirally wound wire in center of coating. All CL&C steel pipe required for the water main installation shall be as specified on the drawing.

d. PVC "Certa-Lok" VIP Restrained Joint Pipe: All PVC "Certa-Lok" VIP Restrained Joint pipe shall be manufactured by CertainTeed. Certa-lok shall comply with the latest revision of AWWA Standard C-900. Pipe is made to ductile-iron-outside-diameter (DI OD), DR 18, Class 150, in twenty foot (20') laying lengths, with twin gasket Certa-Lok couplings, nylon splines, and rubber rings.

e. Steel (Stl) Pipe:All Steel pipe shall be as specified on the drawings.

f. Polyethylene (PE) Pipe: This Section is for PE pipe for mains or services sizes four inch (4") and larger and shall only be used when specified on the drawings. All PE pipe shall be high density polyethylene (HDPE) complying with the latest revision of AWWA Standard C906 and Plastic Pipe Institute (PPI) PE 3408. PE pipe shall conform to the outside diameter for the ductile-iron sizing system (DI OD) in Table 7 of AWWA C906. For water mains where working pressure will be less than one hundred pounds per square inch (100 psi), SDR 17 shall be used. For working pressure between one hundred pounds per square inch and one hundred sixty pounds per square inch (100 psi - 160 psi), SDR 11 shall be used. All pipe shall conform to National Science Foundation (NSF) Standard #14 and #61. All pipe shall either be blue or have blue printing on it to designate its use as a potable

water pipeline. HDPE pipe shall be manufactured by CP Chem (Performance Pipe-Driscoplex).

g. Pipe Fittings: All fittings shall be as specified on the drawings and shall be Ductile Iron complying with the latest revision of AWWA Standard C153 for push-on and mechanical joints fittings and C110 for flanged fittings. All fittings shall either be cement mortar lined in conformance with the latest revision of AWWA Standard C104 or coated with fusion-bonded epoxy inside and outside in conformance with the latest revision of AWWA Standard C116. All fittings shall be manufactured by U.S. Pipe, Union/Tyler, Sigma Corp., or Star Pipe.

h. Gate Valves: All gate valves shall meet or exceed the latest revision of AWWA Standard C515 for reduced wall, resilient-seated gate valves (or C509 for resilient-seated gate valves) and shall be provided with left hand to open, ductile iron (or cast iron) body with epoxy coating inside and outside complying with the latest revision of AWWA Standard C550, nut operated non-rising stem with two inch (2") square operating nut, two (2) O-ring stem seals above the thrust collar and one (1) below, O-ring gaskets and 304 stainless steel bolts and nuts on bonnet and stuffing box and ethylene propylene diene monomer (EPDM) rubber encapsulated wedge (when available at no extra cost). All gate valves shall be manufactured by Mueller Company, M & H Valve and Fitting Company, Kennedy Valve Co., Clow Valve Co., American Flow Control, American AVK Co. or U.S. Pipe. Two inch (2") and smaller gate valves shall be Class 125 with standard thread, bronze with wheel, and be manufactured by Milwaukee (No. 105) or Nibco.

i. Butterfly Valves: All valves greater than twelve inches (12") nominal size shall be butterfly valves. All butterfly valves shall comply with the latest revision of AWWA Standard C504, and shall be provided with "O-ring" packing, left hand to open, nut operated with two inch (2") square operating nuts, ductile iron body, stainless steel shaft, resilient seat and heavy duty actuator. The butterfly valves shall be manufactured by Mueller Company, M & H Valve & Fitting Company, Pratt Company or Kennedy Valve Co.

j. Pressure Reducing Valves (PRV): All pressure reducing valves shall be manufactured by Cla-Val Company. The model number, body construction, and flange drilling shall be as specified on the drawings. All valves shall have factory set controls or pilots as specified on the drawings. All control or pilot piping shall be copper tubing or brass pipe. PRV vaults shall be as specified on the drawings.

k. Check Valves: Unless specified otherwise, all check valves shall be swing type with spring and lever and shall comply with the latest revision of AWWA Standard C508. The valves shall have Class 125 flanged ends unless shown otherwise on the Construction Drawing. Check valves shall be manufactured by Mueller, Clow, M&H, or Kennedy.

l. Valves for Tapping: All gate valves for tapping purposes shall be resilient seat type valves. The valve for tapping shall be manufactured by Mueller Co., Kennedy Valve Co. or Clow Valve Co.

m. Tapping Sleeves: All tapping sleeves shall be all stainless steel including flange and shall only be used when specified in the approved Construction Drawings by the City. Tapping sleeves shall be JCM Model 432, Mueller Model H304, Smith Blair 662-663 or Ford style FTSS.

n. Valve Casings and Covers: All valve casings and covers shall be fabricated as shown in the City of Visalia, Engineering Improvement Standards.

o. Fire Hydrants: All fire hydrants shall be as specified on the district specific drawing or as approved by City personnel. For typical Fire Hydrant details see the City of Visalia, Engineering Improvement Standards.

p. Fire Hydrant Burys: All fire hydrant burys shall be manufactured from Ductile Iron to ASTM A536 and have a minimum working pressure rating of two hundred pounds per square inch (200 psi). Burys shall be manufactured by Clow, SBF, Sigma, or Star Pipe.

q. Service Materials: All one inch (1") and two inch (2") service material specifications except copper tubing and plastic PE pipe shall be as shown in the City of Visalia, Engineering Improvement Standards, which includes alternate manufacturers. All service material specifications for services larger than two inch (2") shall be as specified in the approved Construction Drawings and/or as specified in the City of Visalia, Engineering Improvement Standards for that size service.

r. Saddles: All saddles shall be as specified in the City of Visalia Engineering Improvement Standards.

s. Solder: All solder shall be lead free.

t. Copper Tubing: All copper tubing shall conform to the latest revision of ASTM Specification B88 and be Type K soft.

u. Polyethylene (PE) Service Pipe: All PE plastic pipe for services shall comply with the latest revision of ASTM D2239 with a Standard Code Designation of PE 3408. Dimensions and tolerance of pipe shall be as specified in Table 3 of the latest revision of AWWA Standard C901 for PC 200-IDR7. This is a high density polyethylene plastic pipe conforming to the inside-diameter dimensions of iron pipe sizes and having a two hundred pounds per square inch (200 psi) pressure rating. The pipe shall be approved by NSF as suitable for potable water products.

v. Meter Boxes: All meter boxes for one inch (1") services and two inch (2") services shall be as specified in the City of Visalia, Engineering Improvement Standards. All meter boxes for services larger than two inch (2"), shall be as specified in the approved Construction Drawings and/or as specified in the latest revision of the City of Visalia Engineering Improvement Standards for that size service. All meter boxes for one inch (1") services and two inch (2") services shall be supported by placing bricks or two inch by four inch (2"x4") pressure treated lumber under two (2) sides of the base of the meter box.

w. Vaults: Vaults for appurtanences other than meters (such as Check Valves or PRV's) shall be as specified on the drawings.

x. Machine Bolts: All steel bolts and nuts used for flanged fittings, flexible couplings, or other bolted appurtenances shall be 304 stainless steel. Ductile iron bolts are acceptable when the appurtenance is made of ductile iron and comes with option of ductile iron bolts, such as mechanical joint fittings. Anti-gaul lubricant shall be used with stainless steel bolts & nuts.

y. Two Inch (2") Blow Off Assemblies: All materials for two inch (2") blow off assemblies shall be as shown in the City of Visalia, Engineering Improvement Standards

z. Flexible Couplings: The City may require flexible couplings to be epoxy coated if soil conditions are determined to be corrosive. If the flexible coupling is steel the sleeve must be a minimum of ten inches (10") long. If the flexible coupling is ductile iron then a standard sleeve length may be used unless the drawing specifies otherwise. Flexible Couplings shall be manufactured by Smith Blair, Ford Meter Box Company, or Romac Industries.

aa. Solid Sleeves: All solid sleeves shall be made of ductile iron and shall be manufactured by Tyler Pipe or Union/Tyler Foundry.

bb. PVC High Deflection Couplings: All PVC high deflection couplings shall conform to the latest revision of AWWA C-900 and shall be manufactured by CertainTeed.

cc. PVC Closure Couplings: All PVC closure couplings shall conform to the latest revision of AWWA C-900 and shall be manufactured by CertainTeed.

dd. Two Inch (2") Ball Valves: Two inch (2") ball valves shall be as shown on the Construction Drawing and shall be manufactured by Mueller, James Jones, Ford Meter Box Company or AY McDonald.

ee. Tracer Wire: Tracer wire shall be minimum twelve gauge (#12) solid copper wire with forty-five millimeters (45 mils) of High Molecular Weight Polyethylene (HMWPE) insulation, UL Listed, rated for direct burial, color blue and installed with all pipe including PVC, polyethylene and ductile iron pipe. For installation details see the City of Visalia, Engineering Improvement Standards.

22.02 INSTALLATION OF DUCTILE IRON AND POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND APPURTENANCES

a. Permits: All specification sheets, city/county or other environmental permits necessary for the installation of facilities must be obtained by the Contractor and be on the job site prior to and during construction.

Compliance with all the Rules and Regulations of the California Occupational Safety and Health Act (CAL OSHA), Public Law 91-596, the "Williams' Steiger Occupational Safety and Health Act of 1970", is required on this project. The work practices for all pipe shall be in accordance with the latest revision of the AWWA

Publication C-600 Standard for Installation of Ductile Iron Water Mains and their Appurtenances, C-605 Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and fittings for water, and M23 Manual of Water Supply Practices for PVC Pipe-Design and Installation.

Please note direct discharge of highly chlorinated water to the environment is expressly prohibited. Refer to Section 22.04 "Dechlorination of Flushed Water" in these Standard Specifications for more information. The Contractor shall comply with environmental laws and regulations as set forth by all federal, state and local agencies.

b. Materials: All materials installed for the facilities to be constructed by the Contractor must comply with the approved Construction Drawings and Section 22.01 " Material" in these Standard Specifications. No materials are to be supplied or furnished by the City unless specifically indicated in the approved Construction Drawings for special installations. All materials must be on the job site and inspected prior to start of construction. Any pipe, valve, or appurtenance whether installed or not, which in the opinion of the City, does not meet the requirements of these Standard Specifications or otherwise found unfit, shall be rejected as being unfit, and shall be immediately removed from the job site.

c. Line and Grade: The horizontal and vertical alignment for installation of the pipe shall be established in the field by the Contractor in accordance with the approved Construction Drawings, these Standard Specifications and the Special Provisions. Location of water facilities including finished grades and elevations shall be staked with offsets on site by the Contractor prior to start of construction. Final elevations of installed facilities, meter boxes, valve covers, hydrants, etc. shall be signed off by a City representative prior to acceptance of facilities.

d. Cover: Under normal conditions all mains shall be covered to a depth of four feet (4') below the finished grade over the pipeline, unless specified otherwise in the approved Construction Drawings. Prior approval must be obtained from the City to install mains with greater or less than four feet (4') of cover.

e. Separation Between Water Mains and Sanitary Sewers or other Facilities: Water mains shall be installed at least ten feet (10') horizontally from and one foot (1') higher than sanitary sewers located parallel to the main, unless specified otherwise in the approved Construction Drawings. Install water mains a minimum of one foot (1') higher than sanitary sewers crossing the mains. At all storm and sanitary sewer crossings, a full pipe length shall be centered over the sewer pipe to keep an adequate distance between the sewer and the water pipe joints. A twenty foot (20') length of PVC or eighteen foot (18') length of DI pipe is considered to be a full pipe length. The State of California Department of Health Services "Criteria for the Separation of Water Mains and Non-potable Pipelines" shall be followed when installations cannot meet the "Basic Separation Standards". A minimum vertical clearance of twelve inches (12") shall be maintained between the water main and all foreign structures, and a minimum horizontal clearance of five feet (5') shall be maintained between utilities unless otherwise indicated in the approved Construction Drawings or approved by the City. Refer to "Pipeline Crossing

Information" shown in the City of Visalia Engineering Improvement Standards for information of water main installations crossing other proposed or existing facilities. City approval must be obtained prior to making any changes from the approved Construction Drawings. This includes changing grade or alignment to avoid structures, other pipes, manholes, or any other fixed objects which may be encountered during installation. As per City standards, changes in cover over the pipeline may require the installation of a fabricated steel, cement mortar lined and coated offset.

f. Workmanship: The pipe shall be installed to a true line and grade except on curves where ductile iron pipe may be installed with joint deflections between adjacent lengths of pipe not to exceed three degrees (3°) for ductile iron pipe sizes six inches (6"), eight inches (8"), and twelve inches (12"). PVC pipe shall not be deflected at joints for horizontal or vertical deflection. No joint deflection shall be allowed in joints between fittings and pipe. "Certainteed" PVC Deflection Couplings shall be used with PVC C-900 between adjacent lengths of pipe to attain up to five degrees (5°) deflection at the joint when required.

   When assembling a PVC pipe to an iron fitting, valve, or appurtenance (push-on), remove all but one-fourth of one inch (¼") of the factory made bevel from the spigot end of the pipe. Bottom the pipe in the bell of the iron fitting.

   Field-cut lengths of PVC and DI pipe may be used for making connections to valves, fittings, appurtenances, and closures where necessary. The cutting and beveling of the pipe for inserting into the bell shall be done by the use of a square cutting tool approved by the City and manufactured for this purpose, without damage to the pipe. The bevel of the pipe shall be the same as required for the fitting.

g. Trench Bottom: The bottom of the trench shall be smooth and free from pieces of rock or other material that would tend to scratch, puncture or break the pipe or damage the polyethylene encasement used on ductile iron pipe. If rocks or stones are encountered, they shall be removed to a depth of six inches (6") below bottom of trench and the void filled with material tamped to grade. A six inch (6") layer of sand shall be placed in the trench bottom to provide a firm, stable, and uniform support for the full length of the pipe, except at the joints where bell holes shall be dug two inches (2") below the surface so that the pipe will not be supported by the joint. Under no circumstances shall the bell hole undermine the support for the fittings or valves.

   Valves and other various fittings may be required to be supported by a concrete cradle if it is determined by the City that the bedding in the trench bottom cannot be properly compacted to provide adequate support.

   When an unstable subgrade condition is encountered that could provide inadequate pipe support, the City shall require additional trench depth to be excavated, refilled and compacted with suitable foundation material.

   PVC or DI pipe or appurtenance shall not be laid in water, or when, in the opinion of the City, the trench conditions or the weather are unsuitable for construction.

Any water main which has been submerged shall be removed from the trench and be re-laid. The trench shall be dewatered whenever running or standing water occurs in the trench bottom and the removal shall continue until the pipe has been installed and the backfill has been placed to a sufficient height to prevent the pipe from being submerged in water.

IMPORTANT: All trench excavations shall be in accordance with the Rules and Regulations of the CAL OSHA. This includes all necessary shoring determined by either the depth of trench and/or soil conditions.

h. Pipe and Appurtenances Handling: All water main and appurtenances shall be carefully lowered into the trench by means of padded slings, hooks, pipe tongs, or other suitable equipment consistent with safety, in such a manner to prevent damage to the exterior and interior pipe or appurtenance surfaces. Under no circumstances shall any material be dropped or dumped into the trench. Any foreign material inside the pipe shall be removed and the interior of the pipe kept clean during installation. PVC pipe, ductile iron pipe, or appurtenance with damaged exterior or interior surfaces shall not be installed.

During installation the open ends of the pipe shall be covered at night or when no work is in progress at that point to prevent entrance of trench water, animals, or other foreign matter.

On all pipe, a continuous strip of tracer wire (per material specification) shall be taped to the top exterior surface of the pipe per the City of Visalia, Engineering Improvement Standards. Tracer wire splices using appropriate connectors are required at all locations where the wire is cut.

A polyethylene encasement shall be installed over ductile iron pipe, fittings, and appurtenances per latest revision of AWWA Standard C105 Polyethylene Encasement for Ductile Iron Piping and per the approved Construction Drawings, these Standard Specifications and the Special Provisions, or as requested and directed by the authorized City representatives.

Note: Ductile iron fittings and appurtenances installed on PVC C-900 main shall require polyethylene encasement with a two feet (2') overlap onto the PVC main. This overlap to be secured to main per the latest revision of AWWA Standard C105.

i. Rubber Ring Joints for PVC C-900 and Ductile Iron Pipe: Push-on type rubber ring joints with rubber rings for integral bell ends shall be joined as follows: The ring groove, bell socket and plain end should be wiped clean. Insert the gasket making sure that it faces the proper direction and that it is correctly seated. The plain end shall be beveled and free of any sharp or ragged edges which may damage or dislodge the gasket. Lubricate the entire outside end of the pipe including the pipe bevel, also lubricate the exposed portion of the rubber ring gasket in the bell (See "pipe joint lubricant" below). Push the plain end into the bell by hand or with the use of a bar and block until it is completely seated, keeping the joint straight while pushing. Construction machinery shall not be used to push the pipe into a pipe bell end or a fitting bell end. After assembly, the resulting position of the rubber ring

shall be checked with a feeler gauge.

If "Field Lok" gaskets are specified in the approved Construction Drawings, the gasket shall be installed in accordance with the manufacturer's recommendations.

If "TR FLEX" restrained joint system is specified in the approved Construction Drawings, the joint assembly shall be installed in accordance with the manufacturer's recommendations.

j. Pipe Joint Lubricant: Pipe joint lubricant shall be as specified by the pipe manufacturer and shall be NSF approved for use in potable water systems. When specified by the City, or at the option of the Contractor, Slikstyx spray-on gasket lubricant may be used as an alternative to the traditional lubricant supplied by the pipe manufacturer. This spray-on lubricant may be helpful in reducing taste and odor complaints from excessive traditional lubrication, particularly on dead end mains.

When using Slikstyx, follow these instructions: After cleaning the bell and spigot of all grease, dirt, or foreign material, apply a thin film of Slikstyx gasket lubricant to the gasket and pipe spigot. Use care on rolled fittings and PVC high deflection couplings, as the product will set up and cause difficulty in manipulating fittings. If the pipe will be installed for a long period before attempting to roll a fitting, the traditional pipe lubricant should be considered. One (1) sixteen fluid ounce (16fl oz.) can of Slikstyx will cover approximately forty (40) six inch (6") joints, thirty (30) eight inch (8") joints or twenty (20) twelve inch (12") joints. Slikstyx gasket lubricant is currently distributed by Future Tools, Inc., Wellston, OH 45692, 1-800-576-9707.

k. Mechanical Joints: Mechanical joints shall be joined as follows: The socket and plain end should be wiped clean and any excess coating in the bell should be removed. The plain end, bell socket, and gasket should be washed with a soap solution or lubricant furnished with the gaskets to improve the seating of the gasket in the socket and to help the various parts slide together along the pipe. Place the gland on the plain end with the lip extension toward the plain end of the pipe, followed by the gasket with the narrow edge of the gasket toward the end of the pipe. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during the assembly. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand tighten nuts. Partially tighten the bottom bolt first; then the top bolt; next the bolts at either side; and finally the remaining bolts. Repeat this process until all bolts are torqued to a value between seventy-five foot pounds (75 ft lbs) and ninety foot pounds (90 ft lbs).

If "Mega Lug" mechanical joint retainer glands are specified in the approved Construction Drawings, the gland assembly shall be installed in accordance with the manufacturer's recommendations.

l. Thrust Blocks: Concrete thrust blocks shall be provided for all fittings to prevent movement when the main is under pressure. This includes tees, ells, reducers, caps and plugs. Forms are required and are to be provided by the Contractor. These forms shall be smooth, mortar tight and of sufficient strength to maintain shape during the placing of the concrete. All concrete thrust blocks shall be constructed per the City of Visalia, Engineering Improvement Standards.

m. Embedment Backfill: The embedment backfill is six inches (6") of sand bedding below the pipe and twelve inches (12") of sand backfill above the pipe (see sand definition below). Care must be taken to compact the sand backfill material solidly around and under the pipe. Small tampers and vibrators are allowed for compacting near the pipe and over the pipe after a minimum of six inches (6") of sand backfill has been placed over the pipe. Flooding, jetting or puddling may be employed for compaction in the first lift although great care must be taken to prevent drainage or flotation of the pipeline. Apply only enough water to give complete saturation. Erosion of support at the pipe sides and bottom by water jetting must be prevented. Rocks or hard lumps are not permitted in the embedment backfill or final backfill.

Sand is defined as material free from organic matter and clay with a sieve gradation by weight as follows:

Sieve Size	% Passing Sieve
No. 4	100
No. 200	0 - 5

n. Final Backfill: In areas where required, the permanent pavement and temporary pavement replacement must comply with Section 15. All backfill above the sand embedment backfill must meet compaction requirements according to Section 12. All pavement broken shall be replaced in strict accordance with the requirements of Section 15.

o. Other Facilities: All existing facilities, such as but not limited to sewers, gas mains, water mains, telephone conduits, and power or telephone poles which may be located close to trench operations must be protected by the Contractor. If any of these facilities are damaged by the Contractor, repairs shall be made to the satisfaction of the interested parties at the Contractor's expense.

p. Valve Casings and Covers: A valve casing with cover shall be installed for each gate valve, butterfly valve, two inch (2") blow off assembly or when specified in the approved Construction Drawings per the City of Visalia Engineering Improvement Standards. The valve cover and frame for valves in paved and unpaved areas shall be per the City of Visalia, Engineering Improvement Standards. The valve cover frame shall be set in a ring of concrete a minimum of twenty-four inches (24") in diameter and three inches (3") thick. All valve casing covers must be placed flush with the finished grade of the surrounding area.

q. 2" Blow Off Assemblies: A blow off assembly as shown in the City of Visalia, Engineering Improvement Standards shall be installed for each dead end capped main. The assembly is to include a valve casing and cover.

r. Services and Meter Boxes: Services and meter boxes shall be installed as shown in the City of Visalia, Engineering Improvement Standards for one inch (1") services, for two inch (2") services, and for larger than two inch (2") services as designated in the approved Construction Drawings and/or the latest revision of the Engineering Improvement Standards for that size service. The one inch (1") and two inch (2") service pipe shall be installed at a depth of thirty inches (30") or more from finished grade over the service pipe and in no event shall the depth be less than eighteen inches (18"). The Contractor must get prior approval from the City to install service pipe with less than thirty inches (30") of cover.

All meter box locations must be approved by the City and the boxes must be installed flush with finished grade of the surrounding area at the meter box cover. The meter boxes for one inch (1") and two inch (2") services shall be supported by placing a two inch by four inch (2"x4") treated lumber or bricks on two (2) sides of the meter box's base. Avoid postal and street pedestals, driveways, trees/bushes, fencing, sewer lines, and other utilities.

Saddles and saddle tapping are required for all service connections made on PVC pipe. When making this type of connection, proper equipment must be used which attaches to the corporation stop permitting the cutting tool to be fed through the corporation stop to cut a hole in the pipe. It is important that the cutting tool be a sharp shell type (hole) cutter which will retain the coupon and be designed to accommodate walls as heavy as DR 18 pressure Class 150. The shell cutter shall be lubricated on the outside only and not on the inside of the cutter with a recommended lubricant. Do not drill a hole in the PVC pipe with a twist drill or auger bit.

Direct tapping machines for service connections on ductile iron pipe must be approved by the City prior to direct tapping ductile iron mains. Plastic PE pipe is to be cold flared to match recessed fittings or is to have outside end bevels for Instatite fittings. Forming tool for bevels shall be Mueller's beveling tool number H10817 or approved equal.

s. Connection to Existing System: The Contractor shall furnish to the City the necessary fittings, valves, pipe, and joint material required to connect the new mains to the existing system.

The Contractor must adjust from the nominal line and grade to match the existing facilities.

The Contractor is to complete the piping and maintain the specified clearance from existing main as shown on the drawings. The Contractor shall make the excavation for the tie-in. The trench shall be left in a safe condition for the Contractor to complete the connections. If the trench is considered unsafe for workers, the City may require the Contractor to return and adequately excavate for the tie-ins at the Contractor's expense. After the City has inspected the connection, the Contractor shall install concrete thrust blocks, install valve casings and covers, and backfill the excavation. The Contractor shall then replace any pavement that was cut for the excavation.

The City reserves the right to perform the tie-ins to the existing system if they desire. In this situation, the Contractor will not be paid for the tie-ins as bid.

t. Pressure Test: Prior to any testing, at least seven (7) days should elapse after the last concrete thrust block was poured if Type I portland cement was used and three (3) days if high-early-strength Type III portland cement was used. A preliminary pressure test shall be made by filling the mains with water and allowing them to stand under regular system pressure for a period of at least twenty-four (24) hours. After completion of the preliminary test, the Contractor shall make a hydrostatic test by raising the pressure in the main to fifty pounds per square inch (50 psi) above the normal static pressure at the point of observation with a minimum test pressure of one hundred fifty pounds per square inch (150 psi). A calibrated pressure chart recorder and a water meter shall be provided by the City. The hydrostatic test shall not be conducted without a City representative present. The pressure that the test is started at shall be maintained for a minimum of four (4) hours. The test shall start and finish at the same pressure. If there is a pressure drop, the Contractor shall pump more water into the main through the water meter to bring the main back to its starting pressure. The leakage is the calculated volume of water pumped into the main through the meter. The leakage shall be measured accurately during the test period to determine that the leakage rate does not exceed the values shown in *Table 22.02 A* for ductile iron pipe and *Table 22.02 B* for PVC C-900 pipe. There shall be no leakage, zero gallons per four hours (0 gal/4 hr) test period at one hundred fifty pounds per square inch (150 psi) for the portion of pipeline that is steel pipe CL&C with welded joints. An air test may be used as an alternate method on the steel pipe CL&C welded sections. Test pressure to be one hundred fifty pounds per square inch gauge (150 psig) held for a four (4) hour duration, with no volumetric loss during test period. A calibrated pressure chart recorder will be provided by the authorized testing agency. The necessary taps, connecting pipe, and valve fittings shall be provided by the Contractor. Any leaks or failures that develop during the test shall be repaired by the Contractor immediately.

   If the mains fail to meet requirements of the hydrostatic test, the Contractor shall, at his expense, make repairs to reduce the leakage. The repair work shall be continued until a satisfactory test is made.

u. Disinfection of Mains: All mains that are installed by the Contractor shall be disinfected by the Contractor in accordance with Section 22.03 “Disinfection of New Mains.”

v. Inspection: The City reserves the right of access to the work at all times for the purpose of inspecting and the Contractor shall permit the City’s representative to make an inspection at any time. The Contractor shall notify the City’s Inspector at least forty-eight (48) hours prior to any work being started at the project site. The City will normally provide no more than two (2) inspections per day during normal working hours. The trench must be left open until the City has inspected the new installation and approved that portion of trench to be covered. If the trench is covered prior to the City’s inspection, the Contractor will be required to uncover the trench at the Contractor’s expense.

w. Protection: The Contractor shall at all times provide suitable and adequate danger signals and barricades. If necessary, the Contractor shall also provide temporary bridges across the trench to permit free ingress and egress to and from private driveways or traveled roads or streets. No street shall be closed unless a permit has been obtained from the City.

x. Specifications and Drawings: Specifications and drawings shall be taken together and anything shown on the drawings and not covered by the specifications or covered by the specifications and not shown on the drawings shall be considered as though it were covered by both specifications and drawings. Any points of disagreement should be referred to the City's representative as soon as possible to resolve any possible misunderstandings.

y. Clean Up: Upon completion of the work, the Contractor shall remove all rubbish and waste materials resulting from the Contractor's operations and leave the ground along the route of the pipeline in a neat and clean condition. The Contractor shall be responsible for removal of all excess spoil from the trench excavations, the City shall not accept any responsibility.

z. Guarantee of Workmanship: Notwithstanding Owner's acceptance of the new facilities, the Contractor shall guarantee all of his workmanship for a period of one (1) calendar year from and after acceptance of the work by the Owner. The Contractor shall repair and make good any defects or imperfections in the work at his sole cost and expense. If deficiencies develop during the guaranteed calendar year, such as but not limited to: leaks in the pipeline or appurtenances, settlement of trenches, or deteriorating pavement due to faulty or imperfect workmanship, the Owner retains the right of making repairs and the Contractor is responsible for the cost of said repairs.

TABLE 22.02 A

ALLOWABLE LEAKAGE PER 1000 FT. OF DUCTILE IRON PIPELINE

Average Test Pressure	Nominal Pipe Diameter							
	6"	8"	10"	12"	14"	16"	18"	24"
(PSI)	GALLONS PER HOUR (GPH) *							
200	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.55
175	0.59	0.80	0.99	1.19	1.39	1.59	1.79	2.38
150	0.55	0.74	0.92	1.10	1.29	1.47	1.66	2.20

* If the pipeline under test contains sections for various diameters, the allowable leakage will be the sum of the computed leakage for each size.

TABLE 22.02 B

ALLOWABLE LEAKAGE PER 1000 FT. OF PVC C-900 PIPELINE			
Average Test Pressure	Nominal Pipe Diameter		
	6”	8”	12”
(PSI)	GALLONS PER HOUR (GPH) *		
200	0.57	0.76	1.15
150	0.50	0.66	0.99
* If the pipeline under test contains sections for various diameters, the allowable leakage will be the sum of the computed leakage for each size.			

22.03 DISINFECTION OF NEW MAINS

a. General Instructions:

Precautions shall be taken to prevent soiling of pipe, fittings and other materials. Pipe and fittings shall be stored so as not to accumulate mud or water, and other material shall be stored in a clean, dry location. Particular care shall be taken to keep rubber gaskets and pipe ends clean.

All pipe shall be clean before lowering the pipe into the trench.

When the main is left unattended, even for a short time, the ends shall be plugged to prevent the entrance of foreign material or small animals.

Loading of new mains: A reduced pressure principle (RPP) backflow assembly is required on all new main installations to prevent any chlorine used for disinfection from entering into domestic water supply. The backflow assembly must be tested by a certified backflow assembly tester within the last twelve (12) months. This test will be verified by the City’s Inspector. The backflow assembly can be placed on a blow off or fire hydrant. Backflow assemblies and annual testing will be supplied by, and be the responsibility of the installing Contractor.

Apply the chlorine, using one of the methods described under Section 22.03.b “Chlorine Application Methods” of these Standard Specifications. A City Inspector is to measure the chlorine concentration to insure that a fifty parts per million (50 ppm) concentration has been applied (not to exceed 200 ppm). Samples with a high chlorine concentration must be analyzed with a high range total chlorine test kit. Hach Catalog Number 2444400, or equivalent may be used to the initial dosage test.

Allow heavily chlorinated water to stand therein for a contact period of at least twenty-four (24) hours. If the water temperature is less than forty-one degrees Fahrenheit (41° F), the water shall remain in the pipe for at least forty-eight (48)

hours. A City Inspector is to measure the chlorine after this contact period. When using the tablet method, there must be a detectable free chlorine residual at the end of the required hold time. When using liquid chlorine, the free chlorine residual must be at least ten parts per million (10 ppm) at the end of the required hold time. If the concentration has dropped to less than ten parts per million (10 ppm), then the mains must be superchlorinated by the continuous feed method, and the required contact period shall be repeated due to the high chlorine demand. Equipment used to superchlorinate by the continuous feed method will be provided by the installing Contractor.

At the end of the contact period, flush the main thoroughly, refer to Section 22.04 "Dechlorination of Flushed Water". The City Inspector is to test for chlorine to demonstrate that the water leaving the main has no more chlorine than in the water entering the main.

The City's representative will collect two (2) sample sets at least twenty-four (24) hours apart and work with the Water Quality (WQ) Department in having them analyzed for coliforms and heterotrophic bacteria. The samples should be taken from a combination blow off and sampling device illustrated in the City of Visalia, Engineering Improvement Standards or a service located near the end of the chlorinated section. In accordance with the latest revision of AWWA standard C651 one (1) sample set (two samples 24 hours apart) shall be collected every one thousand two hundred feet (1,200'), and one (1) set from the end of the line and one set from each branch or dead-end.

A WQPM will review the bacteriological results and determine if the main can be put into service. Further flushing and analytical work will be necessary if the bacteriological tests are positive. If any follow-up sample tests positive, the main must be superchlorinated by the continuous feed method. Equipment used to superchlorinate by the continuous feed method will be provided by the installing Contractor. The main will only be put into service with two (2) consecutive sets of negative bacteriological results and a free chlorine residual between three-tenths of one part per million and one part per million (0.3 ppm - 1.0 ppm).

Before a tie-in is performed, the inside surface of all materials such as the tee, pipe nipples, couplings, and tapping sleeve must be swabbed with NSF-grade twelve and five tenths percent (12.5%) sodium hypochlorite (HTH) or heavily dusted with HTH granules.

b. Chlorine Application Methods:

Safety Notes: Chlorine tablets and solutions should be handled with care, as they are dangerous to the eyes, irritating to the skin, and will damage shoes and clothing. Minimize your exposure by reading and having the Material Safety Data Sheet (MSDS) available should an emergency occur. Follow the guidelines for protecting yourself, asking your supervisor when in doubt and by erring on the safe side by using respirators, protective clothing and other protective equipment.

i. Method No. 1 – Calcium Hypochlorite (HTH) Tablet Method

(a) This method works well for short jobs and for small diameter pipe of any kind. It cannot be used where trench water has entered the main. The main cannot be flushed prior to disinfection, so the method requires that the pipe be kept clean during laying.

(b) Use Permatex (Loctite) Form-A-Gasket No. 1 Sealant (Permatex (Loctite) Catalog No. 80001), to fasten the required number of HTH tablets (See Tables 22.03 A and 22.03 B) to the top of each length of pipe. HTH tablets may be oval or round, must be NSF approved, and have sixty-five percent (65%) free chlorine.

(c) Permatex (Loctite) No. 1 is a fast drying, hard-setting gasket sealant designed for sealing rigid materials and flanges, or patching holes and joints where permanent assembly is desired. Please refer to its MSDS for health and safety precautions in its use. Do not use Permatex (Loctite) No. 2, which is a slow-drying, non hardening sealant used where sealing is more important than adhesion. Tubes of Permatex (Loctite) No. 1 may be purchased locally at any auto parts store. The tablets may be fastened to the pipe before it is placed in the trench provided the top of pipe is marked to avoid the possibility that the pipe may be rotated.

(d) HTH tablets should be removed at the end of the day, when pipe is not installed in the ground the same day tablets are applied. Reuse those tablets in the following days if still intact. This is to prevent moisture from reducing the amount of chlorine available for disinfection.

(e) In addition to the tablets, place ten ounces (10 oz) of HTH granules at the upstream end of the first length of pipe into which water will flow. This will insure that heavily chlorinated water flows into crevasses caused by couplings and valves. For long runs, this should be repeated about five hundred feet (500').

(f) When using flexible couplings, apply NSF-grade sodium hypochlorite with a spray bottle method, or place additional HTH granules in the annular space between the coupling and the pipe.

(g) When installing CL&C pipe, one (1) cap full of HTH granules shall be placed in the pipe after the pressure test and before tie-ins. NSF-grade sodium hypochlorite can be used when main needs to be placed in service as soon as possible, and can be flushed to the system chlorine reading.

(h) Fill the pipe very slowly and proceed as outlined under Section 22.03.a "General Instructions".

TABLE 22.03 A
HTH Oval Tablet Method No. 1 of Main Chlorination
Number of Tables Specified for Disinfection of at least 50 ppm

Length of Section	DIAMETERS															
	4"		6"		8"		10"		12"		14"		16"		18"	
	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm
18'	1	95	2	84	3	71	4	61	5	52	7	54	9	53	11	51
20'	1	85	2	75	3	64	4	54	6	56	8	55	10	53	12	50
30'	1	56	2	50	4	57	6	54	8	50	11	51	15	53	18	50
40'	2	85	3	56	5	53	8	54	11	52	15	52	19	50	24	50

TABLE 22.03 B
HTH Round Tablet Method No. 1 of Main Chlorination
Number of Tablets Specified for Disinfection of at least 50 ppm

Length of Section	DIAMETERS															
	4"		6"		8"		10"		12"		14"		16"		18"	
	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm	# of tabs	ppm
18'	1	215	1	95	1	55	2	70	2	50	3	55	3	54	5	55
20'	1	200	1	85	1	50	2	60	3	65	4	65	5	60	6	60
30'	1	130	1	60	2	65	3	60	4	60	5	55	7	55	8	50
40'	1	100	2	85	3	75	4	60	5	55	7	55	9	55	11	55

ii. Method No. 2 - 12.5% Liquid Chlorine (Sodium Hypochlorite)

This method is general in scope and must be used when it is necessary to re-chlorinate an existing main. It may also be used on new mains, in which case place ten ounces (10 oz) of HTH granules at the upstream end of the first length of pipe into which water will flow, and every five hundred feet (500') thereafter.

This method consists of introducing a twelve and five-tenths percent (12.5%) chlorine solution into water which is being used to fill water main. The twelve and five-tenths o percent (12.5%) chlorine solution must be NSF approved and can be purchased through several vendors.

(a) Calculate the total volume (ounces or gallons) of twelve and five-tenths of one percent (12.5%) hypochlorite solution needed, based on the pipe diameter and section length (See *Table 22.03 C* and the example below

Table 22.03 C).

(b) Choose a suitable filling rate and determine the time required to fill the water main from *Table 22.03 D*.

(c) Calculate the twelve and five-tenths of one percent (12.5%) hypochlorite dose rate using the results from 1 and 2 above. Using the examples below *Table 22.03 C & Table 22.03 D*, the dose rate would be one and two-tenths gallons per fifty-two minutes (1.2 gal/52.0 min, or 150 oz/52.0 min) equals two-hundredths of one gallon per one minute (0.02 gal/min, or 3 oz/min).

(d) It is recommended to use a metering pump, a controlled vacuum device, or an equivalent device to introduce the twelve and five-tenths of one percent (12.5%) hypochlorite solution into the main at a constant rate. The feed device and method must be approved by the City prior to loading the main. Adjust the feed device to the dose rate. Introduce the solution through a corporation cock, blow off, or service connection at or ahead of the inlet end of the water main to be disinfected.

(e) After flushing the main thoroughly, adjust the filling rate by measuring the time required to fill a five gallon (5 gal) or other suitable container.

(f) Begin introducing the twelve and five-tenths of one percent (12.5%) hypochlorite solution into the main, and continue until a chlorine residual test on a sample taken from the discharge end of the main shows at least fifty parts per million (50 ppm) chlorine.

(g) Close the filling valve or blow off, and stop introducing hypochlorite solution. Disconnect and flush the feed device and equipment thoroughly with fresh water.

(h) Proceed as outlined under Section 22.03.a “General Instructions.”

TABLE 22.03 C
12.5% Liquid Hypochlorite Method of Main Chlorination
Amount of 12.5% Liquid Hypochlorite (ounces)
Specified for Disinfection of at least 50 ppm

Length of Section	DIAMETERS															
	4"		6"		8"		10"		12"		14"		16"		18"	
	oz.	ppm	oz.	ppm	oz.	ppm	oz.	ppm	oz.	ppm	oz.	ppm	oz.	ppm	oz.	ppm
18'	1	85	2	75	3	60	4	55	6	55	8	55	10	50	13	55
20'	1	75	2	65	3	55	5	60	6	50	9	55	11	50	14	50
30'	1	50	3	65	4	50	7	55	9	50	13	55	16	50	21	50
40'	2	75	3	50	6	55	9	55	12	50	17	50	22	50	27	50

Table 22.03 C is used to calculate the total ounces of 12.5% hypochlorite required to produce water with a free chlorine concentration of at least 50 ppm in the main.
For example: A 20 foot section of 8 inch pipe needs 3 ounces; so for 1000 feet (50-20 foot sections), 50 x 3 = 150 ounces. 150/128 ounces/gal. = 1.2 gal.

TABLE 22.03 D

	DIAMETER OF PIPE BEING DISINFECTED								
	4"	6"	8"	10"	12"	14"	16"	18"	20"
(GPM)	TIME REQUIRED TO FILL 100 FEET OF PIPE (MINUTES)								
10	6.5	14.7	26.1	40.8	58.8	---	---	---	---
20	3.3	7.3	13.0	20.4	29.4	---	---	---	---
35	1.9	4.2	7.5	11.7	16.8	---	---	---	---
50	---	2.9	5.2	8.2	11.8	15.0	20.9	---	---
75	---	2.0	3.5	5.5	7.9	10.7	14.0	---	---
100	---	---	2.6	4.1	5.9	8.0	10.4	13.2	16.3

Table 22.03 D is used to estimate the time required to fill the pipe with chlorinated water.
For example: A flow rate of 50 gpm will fill 1000 feet of 8 inch pipe in 10 x 5.2 = 52.0 minutes.

22.04 DECHLORINATION OF FLUSHED WATER

a. Safety Notes: While it is unlikely that these procedures will produce a hazardous reaction, employees should proceed with caution when working with calcium thiosulfate. Minimize your exposure by reading and having the MSDS available should an emergency occur. Follow the guidelines for protecting yourself, asking your supervisor when in doubt and by erring on the safe side by using respirators,

protective clothing and other personal protective equipment.

i. The discharge/disposal of all chlorinated water generated from the procedures in Section 22.03 "Disinfection of New Mains" shall be the Contractor's responsibility. The Contractor shall comply with all federal, state and local discharge/disposal requirements for chlorinated water.

ii. If dechlorination of the water is required, then the chlorinated water that is discharged to a storm drain shall be dechlorinated by water industry accepted methods. The dechlorinated water will be tested for chlorine residual to verify that no detectable amount of free chlorine is present. This testing will take place from the onset of discharging the water and at frequent intervals throughout the dewatering of the pipe. No discharge to an open stream (waters of the State or waters of the U.S.) will be allowed without a National Pollutant Discharge Elimination System (NPDES) Permit.

iii. Determine the chlorine concentration of the water to be flushed. If the water to be flushed contains a detectable level of chlorine, then that water must be dechlorinated as follows:

Please note: The use of the dechlorinating agent Captor (30% calcium thiosulfate) is recommended by the City. Calcium thiosulfate is less hazardous than other chemicals, and will not deoxygenate the water when marginally over-applied. Gross over-application of any dechlorinating agent is unacceptable because of its potential to deoxygenate a receiving water body. THE USE OF ANOTHER DECHLORINATING AGENT MUST BE APPROVED BY THE CITY.

b. Prepare a Captor solution for water containing the following chlorine residuals:

i. Less than one milligram per one liter (<1 mg/L): add two (2) cups of Captor to twenty-five gallons (25 gal) of water. This will dechlorinate twenty-five thousand gallons (25,000 gal) of water with a chlorine residual of one milligram per one liter (1mg/L) or less.

ii. One milligram per one liter to fifty or more milligrams per one liter (1mg/L - 50+ mg/L): Use straight thirty percent (30%) Captor solution.

c. Calculate the volume of the new main in gallons as follows:

Pipe Length		Pipe Diameter		Pipe Diameter					Total
_____ ft	X	_____ ft	X	_____ ft	X	0.785	X	7.48g/ft³	= ____ gals

d. Calculate the volume of the thirty percent (30%) Captor needed to dechlorinate one milligram per one liter to fifty milligrams per one liter (1 mg/L - 50 mg/L) chlorine residuals for the volume calculated above:

Pipe Volume		Chlorine Concentration (1-50)				Captor		Total
_____ gal	X	_____ mg/L	X	1.45	/	300,000 mg/L	=	____ gals

e. Application of dechlorinating solution:

i. Elevate the dechlorinating solution container by placing it on a truck. Run a length of clear one-fourth of one inch outside diameter (¼" O.D.) polyethylene tubing from the container on the truck to a petcock (True Value Hardware part #776674) mounted on a blow off or hydrant pipe. When the water flow starts, a venturi will be created to siphon the calcium thiosulfate from the container and into the main flowstream. The feed rate of the diluted solution can be adjusted by opening or closing the one-fourth of one inch (¼") in-line valve (True Value Hardware part #467639) on the one-fourth of one inch (¼") tubing.

ii. Check the chlorine residual at the storm drain inlet. If there is a chlorine residual, slowly increase the feed rate of the Captor solution until you can no longer detect chlorine. If there is no chlorine residual at the storm drain inlet, make sure that the Captor solution is not being grossly over applied by slowly decreasing the feed rate until chlorine is detected. Then slowly increase the feed rate again until no chlorine is detected.

iii. Best Management Practices must be used when discharging water into a storm drain. This discharge uses the Developer's NPDES Permits. No sediments shall be allowed to be discharged into a storm drain.

iv. The installing Contractor shall follow the water quality objectives stated below.

(a) pH = 6.5 to 8.5

(b) Chlorine = none detected

(c) Concentration of total suspended solids is less than twenty-five milligrams per one liter (<25 mg/L).

v. If you find that the water naturally dechlorinates itself by the time it reaches the storm drain inlet, there is no need to add the Captor solution.

APPENDIX J

ENGINEERING DESIGN & IMPROVEMENT STANDARDS

2016



Prepared by: Engineering Division

For latest edition of these Improvement Standards, refer to City of Visalia website at:
www.visalia.city/EngineeringDocuments

ENGINEERING DESIGN & IMPROVEMENT STANDARDS

UNDER THE AUTHORITY OF

THE CITY OF VISALIA

NICK MASCIA

CITY ENGINEER

EFFECTIVE DATE: SEPTEMBER 16, 2016

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS DOMENIC MASCIA
No. C81734
CIVIL
STATE OF CALIFORNIA

EXP. MARCH 2018

City of Visalia
Community Development Department
Engineering Division
315 E. Acequia Ave
Visalia, CA 93291

Revisions to Improvement Standards:

Below is a list of standards that have been revised after the release of the City's 2016 Improvement Standards implemented on September 19, 2016.

Standard	Name	Date		Description of Change
C-29	Major Commercial Drive Approach 20' Radius Curb Return - Alternative	10/28/16		Corrected some dimensions on "Section A-A" of the drawing. (15' & 18' needed to be swapped)

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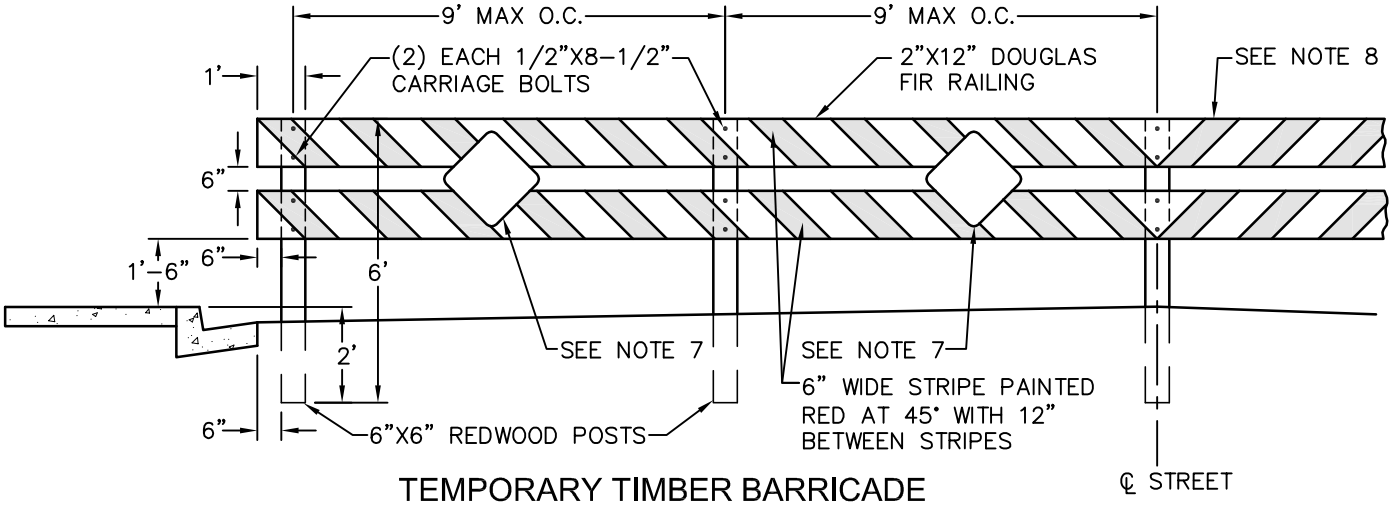
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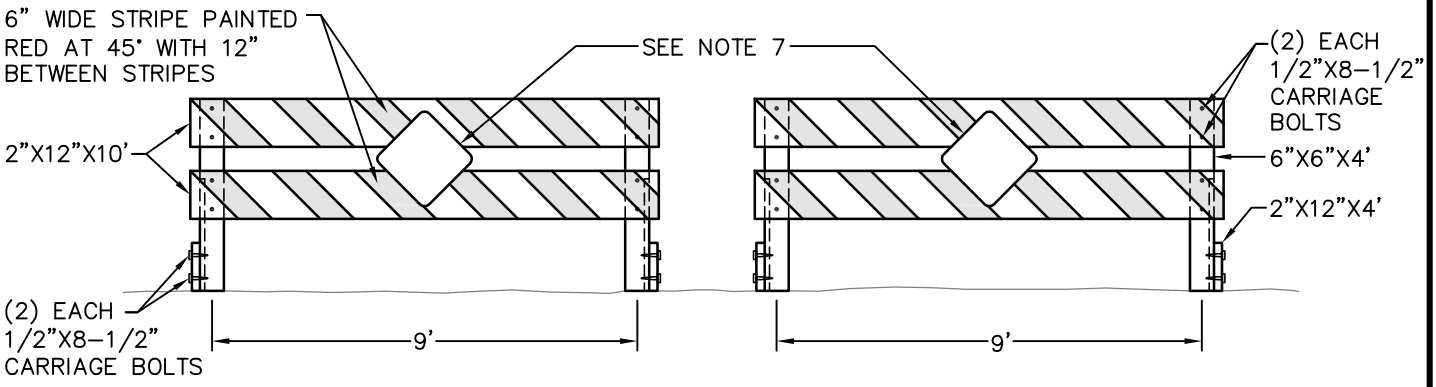
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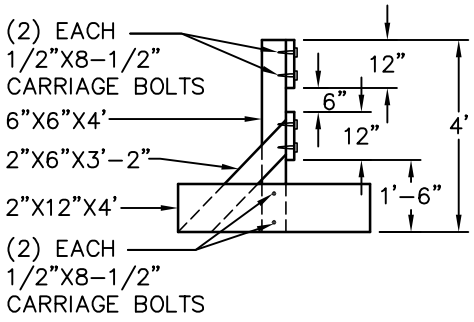
TEMPORARY TIMBER BARRICADE

FOR TYPICAL CONDITIONS



PORTABLE TIMBER BARRICADE

FOR SPECIAL CONDITIONS



PORTABLE TIMBER BARRICADE

SIDE VIEW

NOTES:

1. BARRICADES SHALL BE FULL WIDTH OF PAVEMENT OR TRAVELED WAY OR AS APPROVED BY THE CITY ENGINEER.
2. BARRICADE SHALL BE PAINTED WITH TWO COATS OF WHITE PAINT. FOLLOWED BY TWO COATS OF RED PAINT FOR THE STRIPE. PAINT SHALL BE A PREMIUM QUALITY EXTERIOR GLOSS OR SEMI-GLOSS ENAMEL AND SHALL BE PURE WHITE IN COLOR. PAINT SHALL COMPLETELY SEAL ALL EXPOSED SURFACES OF THE BARRICADE.
3. WOOD PRESSURE TREATED WITH A PRESERVATIVE MAY BE SUBSTITUTED FOR REDWOOD MATERIAL.
4. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE CALIFORNIA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
5. USE OF THE PORTABLE TIMBER BARRICADE OR BARRICADES WITH A LOCK AND CHAIN, SHALL BE SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
6. ABANDONED BARRICADES SHALL BE RECLAIMED BY THE CITY OF VISALIA.
7. REFLECTOR SIGNS – CALIFORNIA 0M4-1. FASTEN REFLECTOR SIGN TO BARRICADE WITH 3/8" X 1-1/2" GALVANIZED LAG SCREWS WITH WASHERS.
8. DIAGONAL STRIPES ON BARRICADE SHALL POINT TO THE CENTER OF THE ROADWAY.

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TIMBER BARRICADES

REVISIONS
06/14/13
BK 2016

B-1

GENERAL CONCRETE NOTES

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE UNLESS OTHERWISE SPECIFIED.
2. CLASS 2 CONCRETE SHALL CONTAIN NOT LESS THAN 590 POUNDS OF PORTLAND CEMENT PER CUBIC YARD WITH 1 INCH AGGREGATE. 5 INCH MAXIMUM SLUMP. 3000 P.S.I. AT 28 DAYS.
3. CLASS 3 CONCRETE SHALL CONTAIN NOT LESS THAN 505 POUNDS OF PORTLAND CEMENT PER CUBIC YARD WITH 1 INCH AGGREGATE. 5 INCH MAXIMUM SLUMP. 2500 P.S.I. AT 28 DAYS.
4. CLASS 4 CONCRETE SHALL CONTAIN NOT LESS THAN 420 POUNDS OF PORTLAND CEMENT PER CUBIC YARD WITH 1 INCH AGGREGATE. 5 INCH MAXIMUM SLUMP. 2500 P.S.I. AT 28 DAYS.
5. WHEN MAXIMUM DAYTIME TEMPERATURE EXCEEDS 50° F. ALL NEWLY PLACED CONCRETE SHALL BE SPRAYED UNIFORMLY WITH A CURING COMPOUND. CURING COMPOUND SHALL BE APPLIED AT A NOMINAL RATE OF ONE GALLON PER 150 SQUARE FEET, UNLESS OTHERWISE SPECIFIED.
6. ALL WORK CONSTRUCTED BY THESE STANDARDS SHALL BE IN COMPLIANCE WITH ALL CURRENT ADA AND PROWAG REGULATIONS.
7. WHERE REBAR IS USED, CONTRACTOR SHALL INSTALL WIRE TIES SECURELY AT ALL REBAR CROSSINGS. CONCRETE BLOCK OR CHAIRS AS APPROVED BY THE CITY ENGINEER SHALL BE INSTALLED PRIOR TO CONCRETE INSTALLATION TO KEEP REBAR IN THE PROPER LOCATION.
8. CONCRETE JOINTS IN THE PATH OF TRAVEL SHALL BE FINISHED WITH A 1/4" RADIUS TOOL AND SHALL MEET ADA GAP TOOL TESTING REQUIREMENTS.
9. WHERE CURBS ARE ADJACENT TO CONCRETE FLATWORK, THE JOINTS IN THE FLATWORK AND CURBING SHALL BE ALIGNED WHERE POSSIBLE.
10. NO CONCRETE FLATWORK SLOPES SHALL BE LESS THAN 1.0%. THIS IS FOR DRAINAGE PURPOSES.
11. ALL CONCRETE SURFACES SHALL BE TESTED FOR WATER FLOW.
12. ABBREVIATIONS: TYP. OR TYP = TYPICAL, MIN = MINIMUM, MAX. OR MAX = MAXIMUM, PROWAG = PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES

APPROVED BY: _____ 01/29/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

CONCRETE SPECIFICATIONS

REVISIONS
01/29/25
BK 2016

C-1

CURBS AND GUTTERS

1. ALL CURB AND GUTTER, VEE GUTTER, MEDIAN CURB AND LANDSCAPE CURB SHALL BE CLASS 2 OR CLASS 3 CONCRETE.

2. BARRIER TYPE CURB AND GUTTER SHALL HAVE A MINIMUM GRADIENT OF 0.20 FEET PER 100 FEET OR AS APPROVED BY THE CITY ENGINEER.

3. BARRIER TYPE CURB AND GUTTER ON THE CURVE OF CUL–DE–SACS AND STREET BULBS SHALL HAVE A MINIMUM GRADIENT OF 0.35 FEET PER 100 FEET OR AS APPROVED BY THE CITY ENGINEER.

4. ROLL TYPE CURB AND GUTTER SHALL HAVE A MINIMUM GRADIENT OF 0.35 FEET PER 100 FEET OR AS APPROVED BY THE CITY ENGINEER.

5. VEE GUTTER SHALL HAVE A MINIMUM GRADIENT OF 0.25 FEET PER 100 FEET OR AS APPROVED BY THE CITY ENGINEER.

6. ALL CURB AND GUTTER, VEE GUTTER, MEDIAN CURB AND LANDSCAPE CURB SHALL BE PLACED ON 6 INCH MOIST AND COMPACTED BASE MATERIALS. 95 PERCENT MINIMUM RELATIVE COMPACTION.

7. ALL CURB AND GUTTER, VEE GUTTER, MEDIAN CURB AND LANDSCAPE CURB SHALL HAVE A LIGHT BROOM FINISH.

8. ALL CURB AND GUTTER AND VEE GUTTER SHALL HAVE WEAKENED PLANE JOINTS CONSTRUCTED AT 15 FOOT CENTERS. MEDIAN CURB AND LANDSCAPE CURB SHALL HAVE WEAKENED PLANE JOINTS CONSTRUCTED AT 8 FOOT CENTERS. WEAKENED PLANE JOINTS SHALL BE A MINIMUM OF 1–1/2 INCHES IN DEPTH AND SHALL BE FINISHED WITH A SCORING TOOL LEAVING THE EDGES ROUNDED.

9. ALL EXPOSED SURFACES OF CURB AND GUTTER, VEE GUTTER, MEDIAN CURB AND LANDSCAPE CURB SHALL NOT VARY IN EXCESS OF 0.02 FEET WHEN A 10 FOOT STRAIGHT EDGE IS PLACED ON THE SURFACE, EXCEPT AT GRADE CHANGES OR CURVES.

10. ALL CURB AND GUTTER AND VEE GUTTER SHALL BE WATER TESTED FOR FLOW.

11. ALL CURB AND GUTTER, VEE GUTTER, MEDIAN CURB AND LANDSCAPE CURB SHALL BE CURED IN ACCORDANCE WITH THE PROVISIONS IN THE GENERAL CONCRETE NOTES IN THESE IMPROVEMENT STANDARDS.

APPROVED BY: _____ CITY ENGINEER R.C.E. 71192 — 01/29/25 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS	
CONCRETE SPECIFICATIONS	REVISIONS 01/29/25 BK 2016	C–2

SIDEWALKS AND RAMPS

1. ALL SIDEWALKS AND RAMPS SHALL BE CLASS 2 OR CLASS 3 CONCRETE.
2. SIDEWALKS AND RAMPS SHALL BE PLACED ON 6 INCH MOIST AND COMPACTED BASE MATERIALS. 90 PERCENT RELATIVE COMPACTION UNDER SIDEWALKS. 95 PERCENT RELATIVE COMPACTION UNDER RAMPS AND SIDEWALKS AT CURB RETURNS.
3. SIDEWALKS AND RAMPS SHALL BE STEEL TROWELED AND HAVE A LIGHT BROOM FINISH UNLESS OTHERWISE NOTED. RAMPS SHALL HAVE A HEAVY BROOM FINISH ACROSS THE SLOPE OF THE RAMP.
4. SIDEWALKS AND RAMPS SHALL HAVE WEAKENED PLANE JOINTS CONSTRUCTED AT 15 FOOT CENTERS AND WHERE SHOWN IN THESE IMPROVEMENT STANDARDS. WEAKENED PLANE JOINTS SHALL BE A MINIMUM OF 1 INCH IN DEPTH AND SHALL BE FINISHED WITH A SCORING TOOL LEAVING THE EDGES ROUNDED.
5. ESTABLISHED SIDEWALK PATTERN IN BLOCK SHALL BE MATCHED.
6. SPECIAL SIDEWALK DESIGNS AND MATERIALS SHALL BE SUBJECT TO APPROVAL BY THE CITY ENGINEER.
7. SIDEWALK INSTALLED IN INFILL OR EXISTING AREAS SHALL BE SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
8. ALL SIDEWALKS AND RAMPS SHALL BE CURED IN ACCORDANCE WITH THE PROVISIONS IN THE GENERAL CONCRETE NOTES OF THESE IMPROVEMENT STANDARDS.
9. DETECTABLE WARNING SURFACES SHALL BE INSTALLED PER THESE IMPROVEMENT STANDARDS AND AS REQUIRED BY THE CITY ENGINEER.

DRIVE APPROACHES

1. ALL DRIVE APPROACHES SHALL BE CLASS 2 OR CLASS 3 CONCRETE UNLESS OTHERWISE NOTED.
2. SINGLE FAMILY RESIDENTIAL DRIVE APPROACHES SHALL BE PLACED ON 6 INCH MOIST AND COMPACTED BASE MATERIALS. 95 PERCENT RELATIVE COMPACTION.
3. MULTI–FAMILY RESIDENTIAL, OFFICE AND COMMERCIAL DRIVE APPROACHES SHALL BE PLACED ON 6 INCH MOIST AND COMPACTED BASE MATERIALS. 95 PERCENT RELATIVE COMPACTION.
4. MAJOR COMMERCIAL DRIVE APPROACHES SHALL BE PLACED ON 6 INCH MOIST AND COMPACTED CLASS 2 AGGREGATE BASE OVER 6 INCH MOIST AND COMPACTED BASE MATERIALS. 95 PERCENT RELATIVE COMPACTION.
5. DRIVE APPROACHES SHALL BE STEEL TROWELED AND HAVE A LIGHT BROOM FINISH.
6. DRIVE APPROACHES SHALL HAVE A WEAKENED PLANE JOINT CONSTRUCTED AT EACH EDGE AND AT THE CENTERLINE. WEAKENED PLANE JOINTS SHALL BE A MINIMUM OF 1–1/2 INCH IN DEPTH AND SHALL BE FINISHED WITH A SCORING TOOL LEAVING THE EDGES ROUNDED.
7. NOT MORE THAN 50 PERCENT OF PROPERTY FRONTAGE SHALL BE USED AS DRIVE APPROACH.
8. DRIVE APPROACHES ON STATE ROUTES ARE SUBJECT TO APPROVAL BY CALTRANS.
9. ALL EXPOSED SURFACES OF DRIVE APPROACHES AND FLOW LINES SHALL NOT VARY IN EXCESS OF 0.02 FEET WHEN A 10 FOOT STRAIGHT EDGE IS PLACED ON THE SURFACE, EXCEPT AT GRADE CHANGES OR CURVES.
10. ALL DRIVE APPROACHES SHALL BE CURED IN ACCORDANCE WITH THE PROVISIONS IN THE GENERAL CONCRETE NOTES OF THESE IMPROVEMENT STANDARDS.

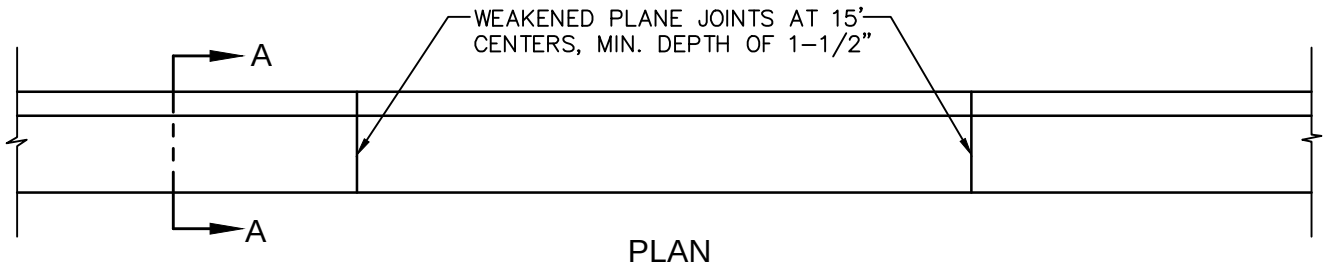
APPROVED BY: Chris Young 01/29/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

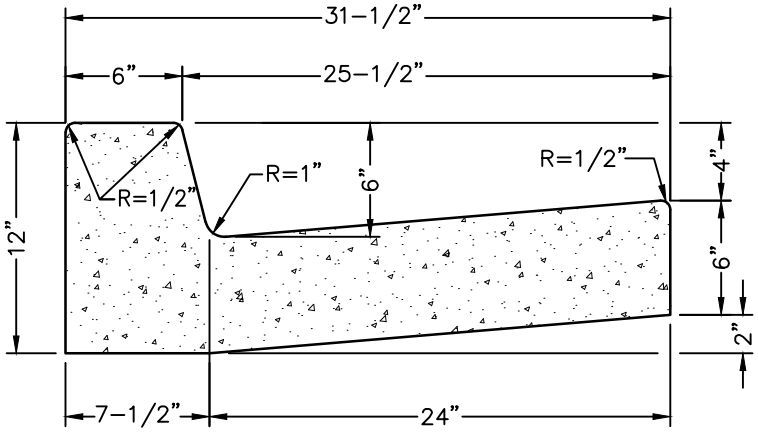
CONCRETE SPECIFICATIONS

REVISIONS
01/29/25
BK 2016

C–3



PLAN



SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. A WEAKENED PLANE JOINT OR COLD JOINT SHALL BE INSTALLED AT THE END OF CURB RETURNS AND AT THE CENTERLINE OF PROPOSED DRIVE APPROACHES.
3. CALTRANS FACILITIES REQUIRE STATE STANDARD CURB AND GUTTER.
4. WHERE ADA ACCESSIBLE PATH CROSSES GUTTER PAN, SLOPE IN THE DIRECTION OF TRAVEL SHALL BE 4% MININMUM AND 5% MAXIMUM.

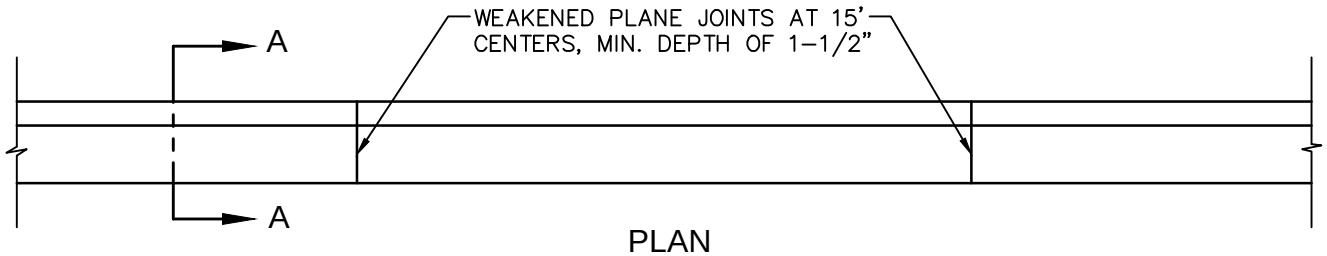
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

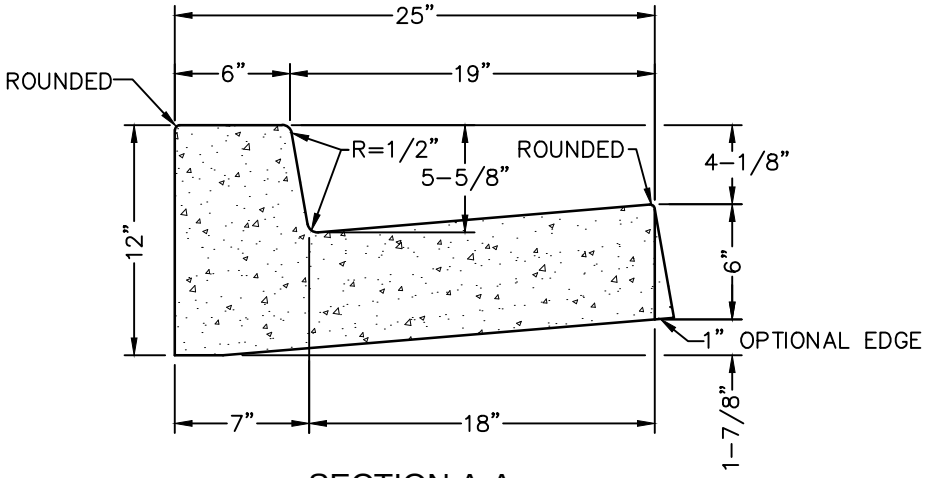
BARRIER CURB AND GUTTER TYPE A2–6

REVISIONS
06/30/16
BK 2016

C–4



PLAN

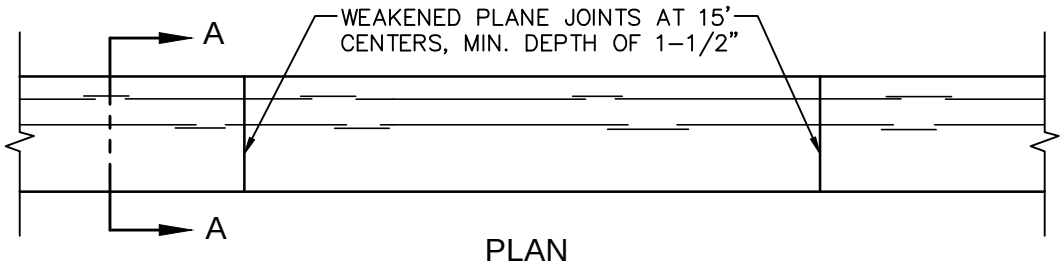


SECTION A-A

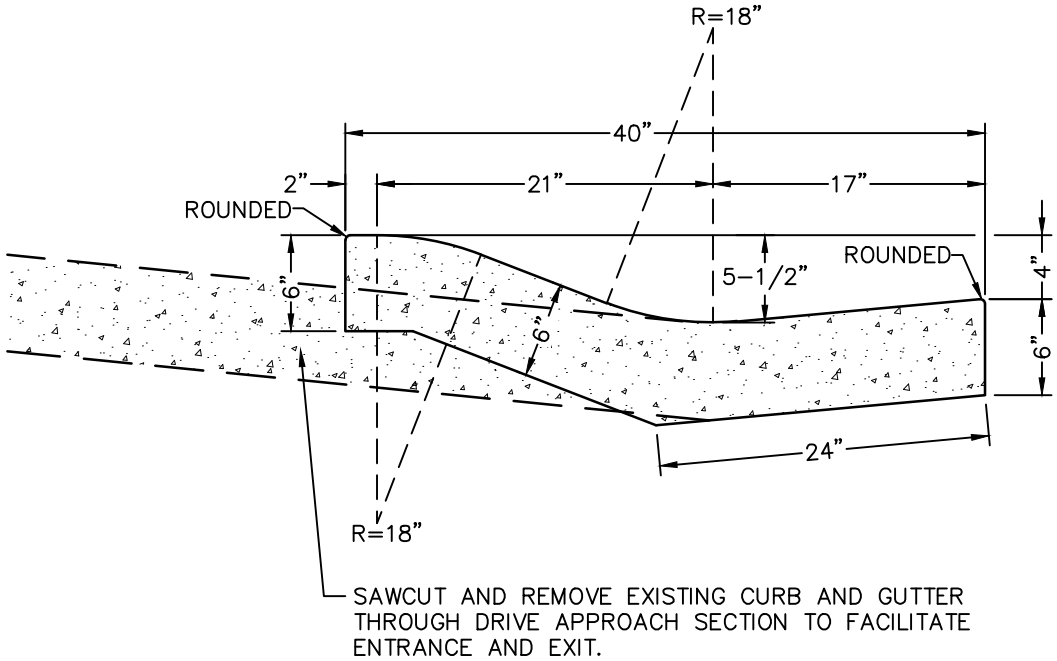
NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. A WEAKENED PLANE JOINT OR COLD JOINT SHALL BE INSTALLED AT THE END OF CURB RETURNS AND AT THE CENTERLINE OF PROPOSED DRIVE APPROACHES.
3. ABOVE TYPE CURB AND GUTTER SHALL NOT BE CONSTRUCTED EXCEPT TO COMPLETE A BLOCK WITH EXISTING ABOVE TYPE CURB AND GUTTER OR TO REPLACE EXISTING DAMAGED ABOVE TYPE CURB.
4. WHERE ADA ACCESSIBLE PATH CROSSES GUTTER PAN, SLOPE IN THE DIRECTION OF TRAVEL SHALL BE 4% MINIMUM AND 5% MAXIMUM.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
BARRIER TYPE CURB AND GUTTER (INFILL & REPLACEMENT ONLY)	REVISIONS 06/30/16 BK 2016 — C–5



PLAN

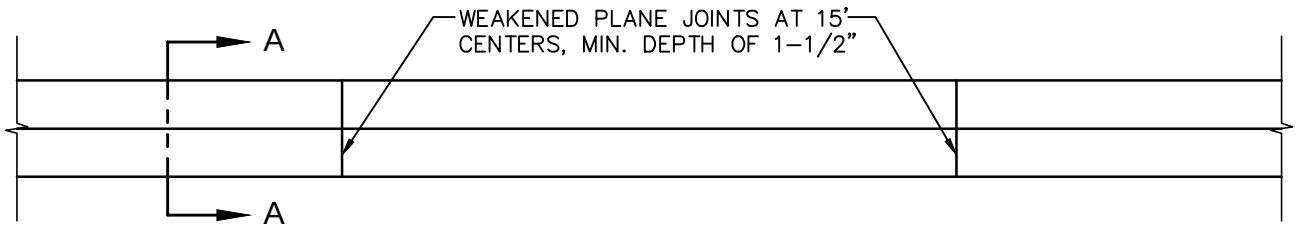


SECTION A-A

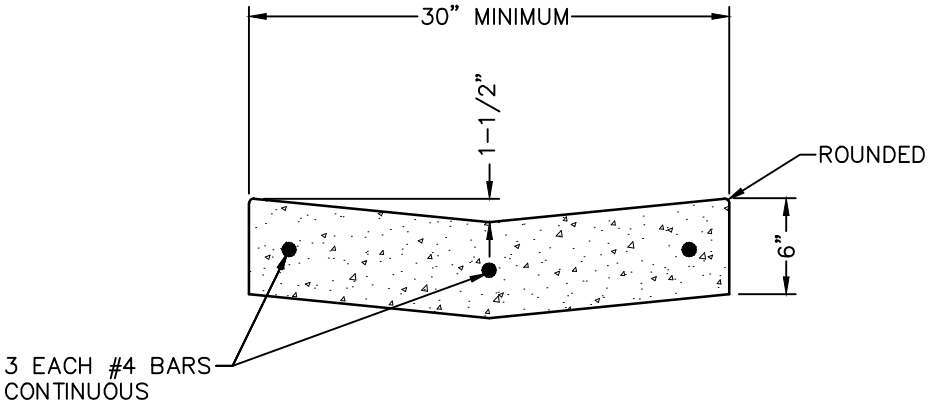
NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. A WEAKENED PLANE JOINT OR COLD JOINT SHALL BE INSTALLED AT THE END OF CURB RETURNS AND AT THE CENTERLINE OF PROPOSED DRIVE APPROACHES.
3. ROLL TYPE CURB AND GUTTER SHALL NOT BE CONSTRUCTED EXCEPT TO COMPLETE A BLOCK WITH EXISTING ROLL TYPE CURB AND GUTTER OR TO REPLACE EXISTING DAMAGED ROLL CURB.
4. WHERE ADA ACCESSIBLE PATH CROSSES GUTTER PAN, SLOPE IN THE DIRECTION OF TRAVEL SHALL BE 4% MINIMUM AND 5% MAXIMUM.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
ROLL TYPE CURB AND GUTTER (INFILL & REPLACEMENT ONLY)	REVISIONS 06/14/13 BK 2016 — C-6



PLAN

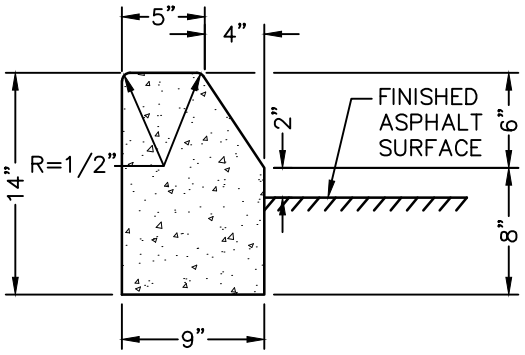


SECTION A-A

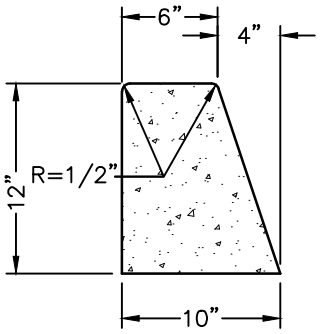
NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. REBAR SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REBAR SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
3. REBAR SHALL HAVE A MINIMUM OF 2" OF CLEAR COVERAGE.
4. WHERE ADA ACCESSIBLE PATH CROSSES GUTTER PAN, SLOPE IN THE DIRECTION OF TRAVEL SHALL BE 4% MINIMUM AND 5% MAXIMUM.

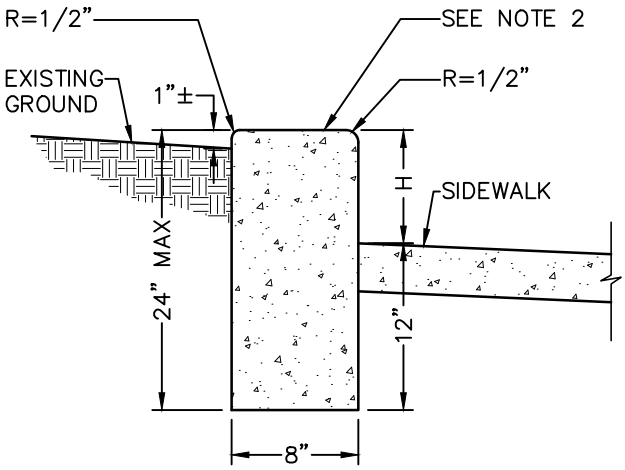
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
VEE GUTTER	REVISIONS 09/14/16 BK 2016 — C–7



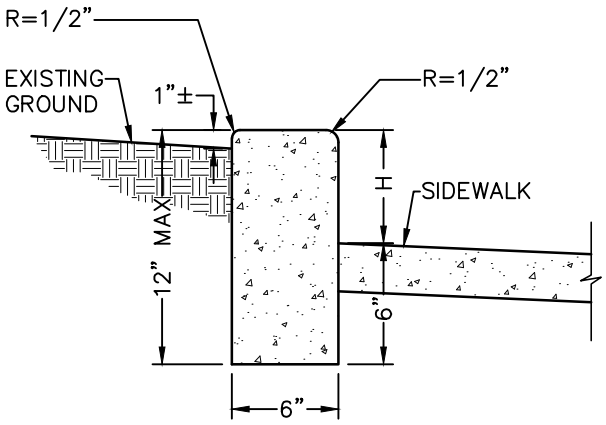
MEDIAN CURB TYPE B1-6
STREET APPLICATIONS



LANDSCAPE CURB
NON-STREET APPLICATIONS



RETAINING CURB
NON-STREET APPLICATIONS
USE WHEN H>6"



RETAINING CURB
NON-STREET APPLICATIONS
USE WHEN H ≤6"

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. REBAR SHALL BE USED AT THE DISCRETION OF THE CITY ENGINEER.

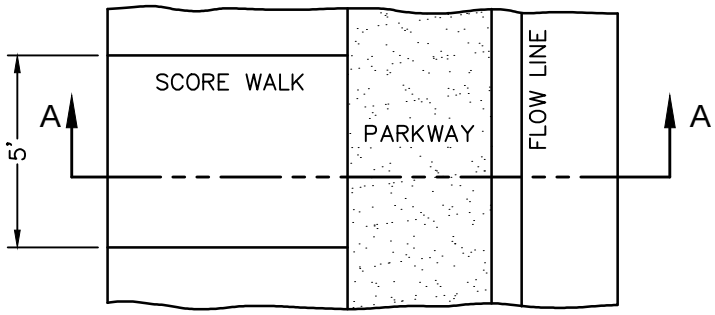
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

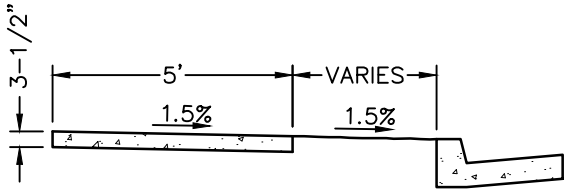
MEDIAN CURB TYPE B1–6, RETAINING CURB AND LANDSCAPE CURB

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06/14/13
BK 2016

C–8



PLAN

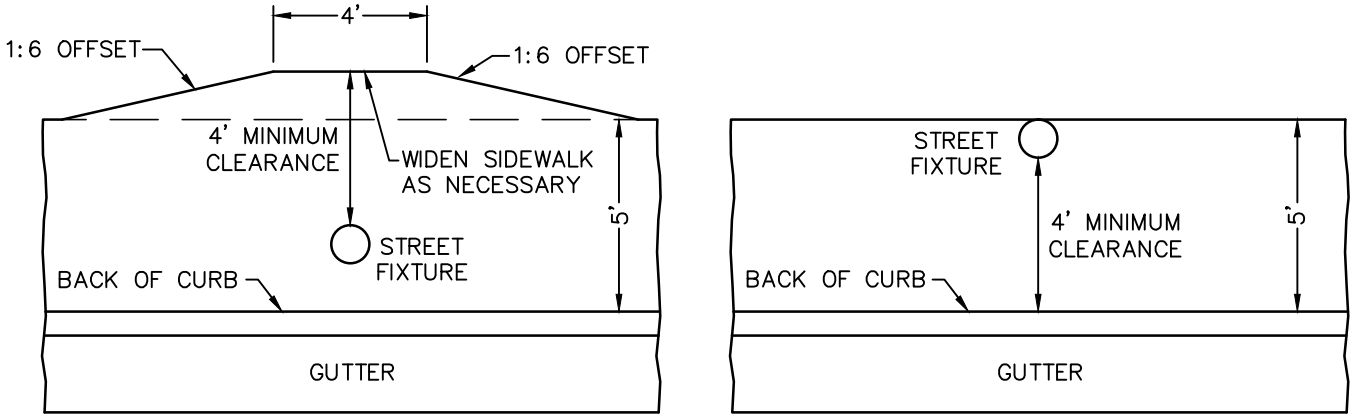


SECTION A-A

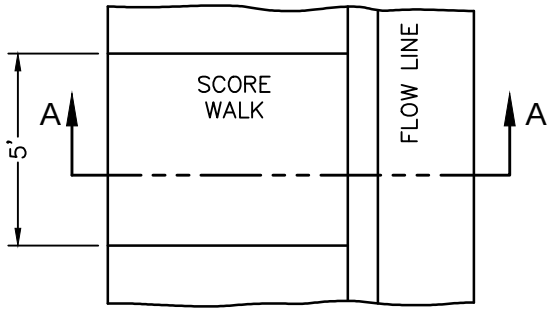
NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.

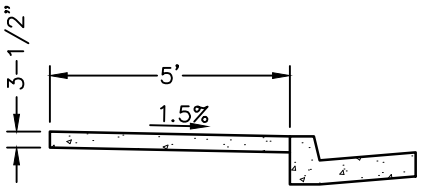
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
SIDEWALK – RESIDENTIAL WITH PARKWAY	REVISIONS 06/30/16 BK 2016
	C–9



PLAN WITH STREET FIXTURE



PLAN

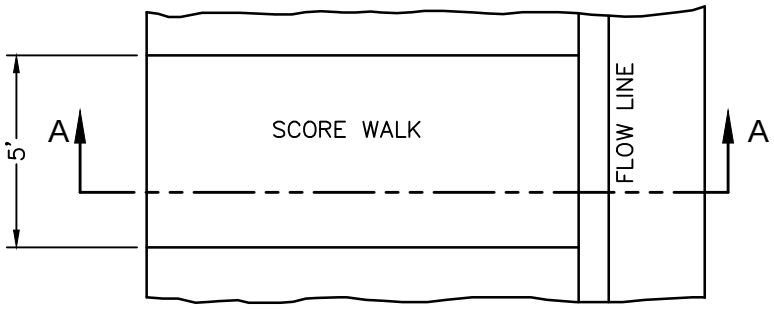


SECTION A-A

NOTES:

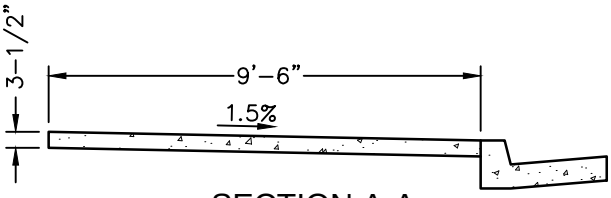
1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. SIDEWALK SHALL BE WIDENED AT STREET FIXTURE LOCATIONS PROVIDING A MINIMUM CLEARANCE OF 4' TO BACK OF SIDEWALK, OR AS APPROVED BY CITY ENGINEER.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
SIDEWALK – RESIDENTIAL ADJACENT TO CURB	REVISIONS 06/30/16 BK 2016 — C–10

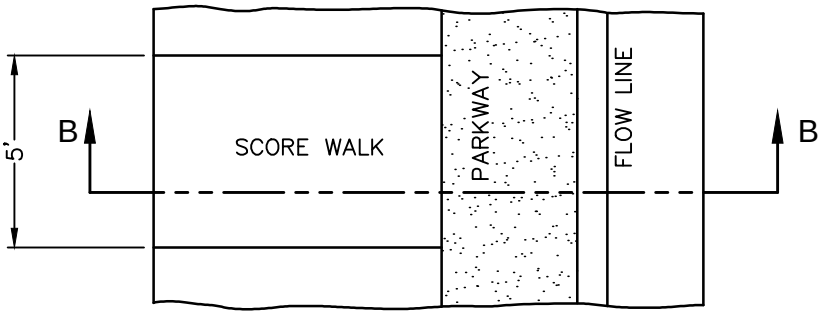


PLAN

DOWNTOWN COMMERCIAL

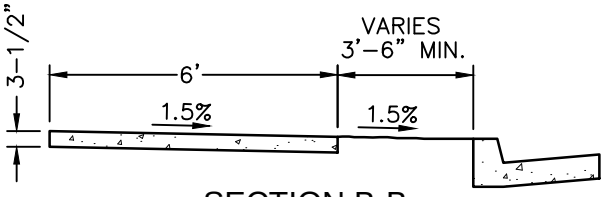


SECTION A-A



PLAN

WITH PARKWAY

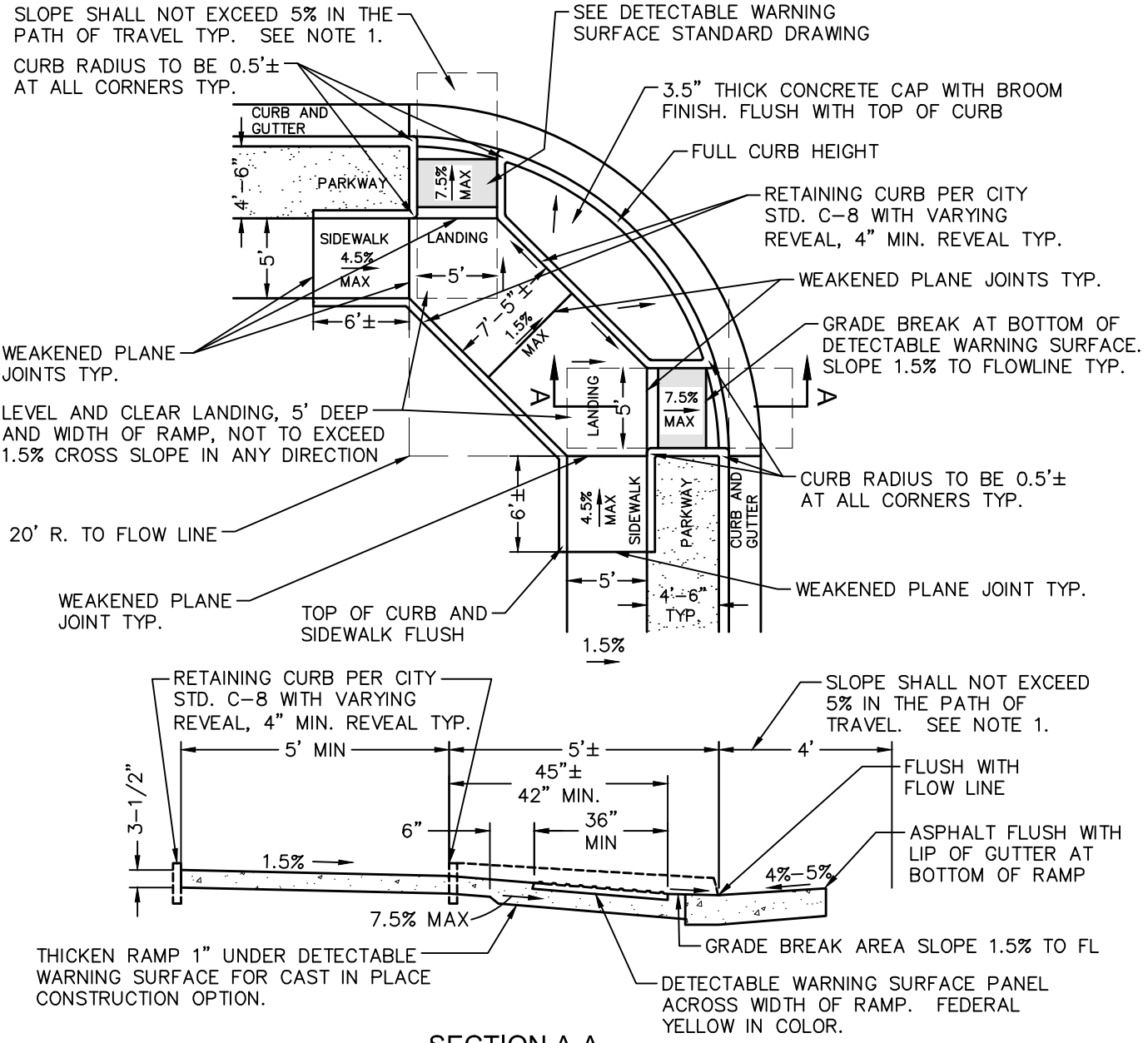


SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
SIDEWALKS – OFFICE/COMMERCIAL	REVISIONS 06/30/16 BK 2016 / C–11



SECTION A-A

NOTES:

1. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE CURB AND GUTTER FLOWLINE
2. NO CROSS SLOPE IN THE PATH OF TRAVEL TO EXCEED 1.5% OR BE LESS THAN 1.0%
3. DEPRESSED CURB AND GUTTER LIPS AT RAMPS SHALL TRANSITION BACK TO NORMAL CURB AND GUTTER LIP SLOPES OVER A DISTANCE OF AROUND 5'
4. APPLICABLE TO LOCAL STREET INTERSECTIONS IN RESIDENTIAL AND OFFICE ZONES
5. THE DESIGN ENGINEER IS RESPONSIBLE FOR DESIGNING EACH RAMP AND ALL GRADES TO BE COMPLIANT WITH ADA AND PROWAG REQUIREMENTS
6. CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS C-1 AND C-3 FOR ADDITIONAL SPECIFICATIONS

APPROVED BY: _____ 01/29/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

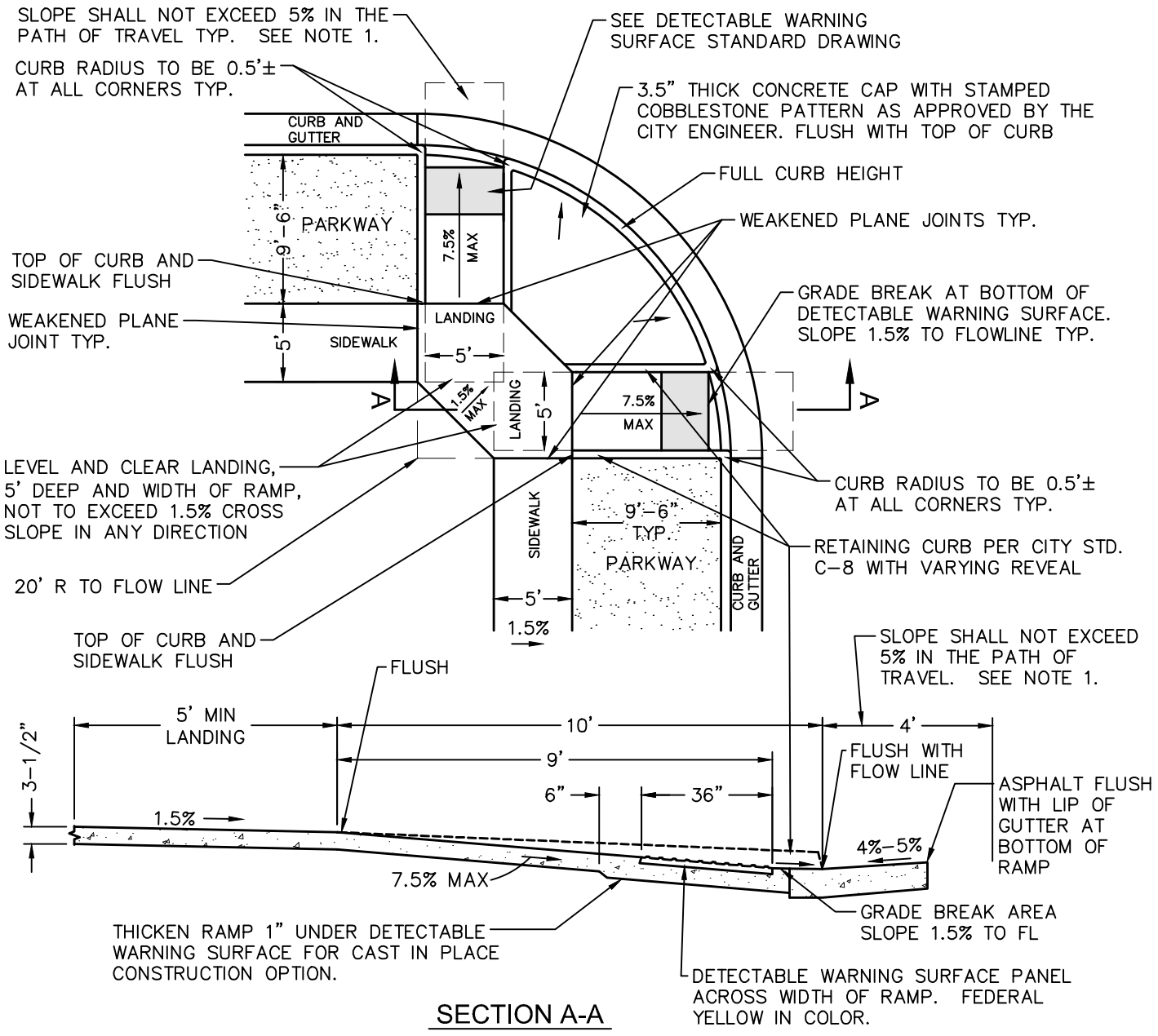
20' RADIUS CURB RETURN WITH DIRECTIONAL RAMPS – DETAIL 1

REVISIONS
01/29/25
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RESERVED FOR FUTURE DETAIL

APPROVED BY: _____ CITY ENGINEER R.C.E. 71192 _____ DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS BK 2016
	C–13



SECTION A-A

NOTES:

1. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE CURB AND GUTTER FLOWLINE
2. NO CROSS SLOPE IN THE PATH OF TRAVEL TO EXCEED 1.5% OR BE LESS THAN 1.0%
3. DEPRESSED CURB AND GUTTER LIPS AT RAMPS SHALL TRANSITION TO NORMAL CURB AND GUTTER LIP SLOPES OVER A DISTANCE OF AROUND 5'
4. APPLICABLE TO LOCAL STREET INTERSECTIONS IN RESIDENTIAL AND OFFICE ZONES
5. THE DESIGN ENGINEER IS RESPONSIBLE FOR DESIGNING EACH RAMP AND ALL GRADES TO BE COMPLIANT WITH ADA AND PROWAG REQUIREMENTS
6. CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS C-1 AND C-3 FOR ADDITIONAL SPECIFICATIONS

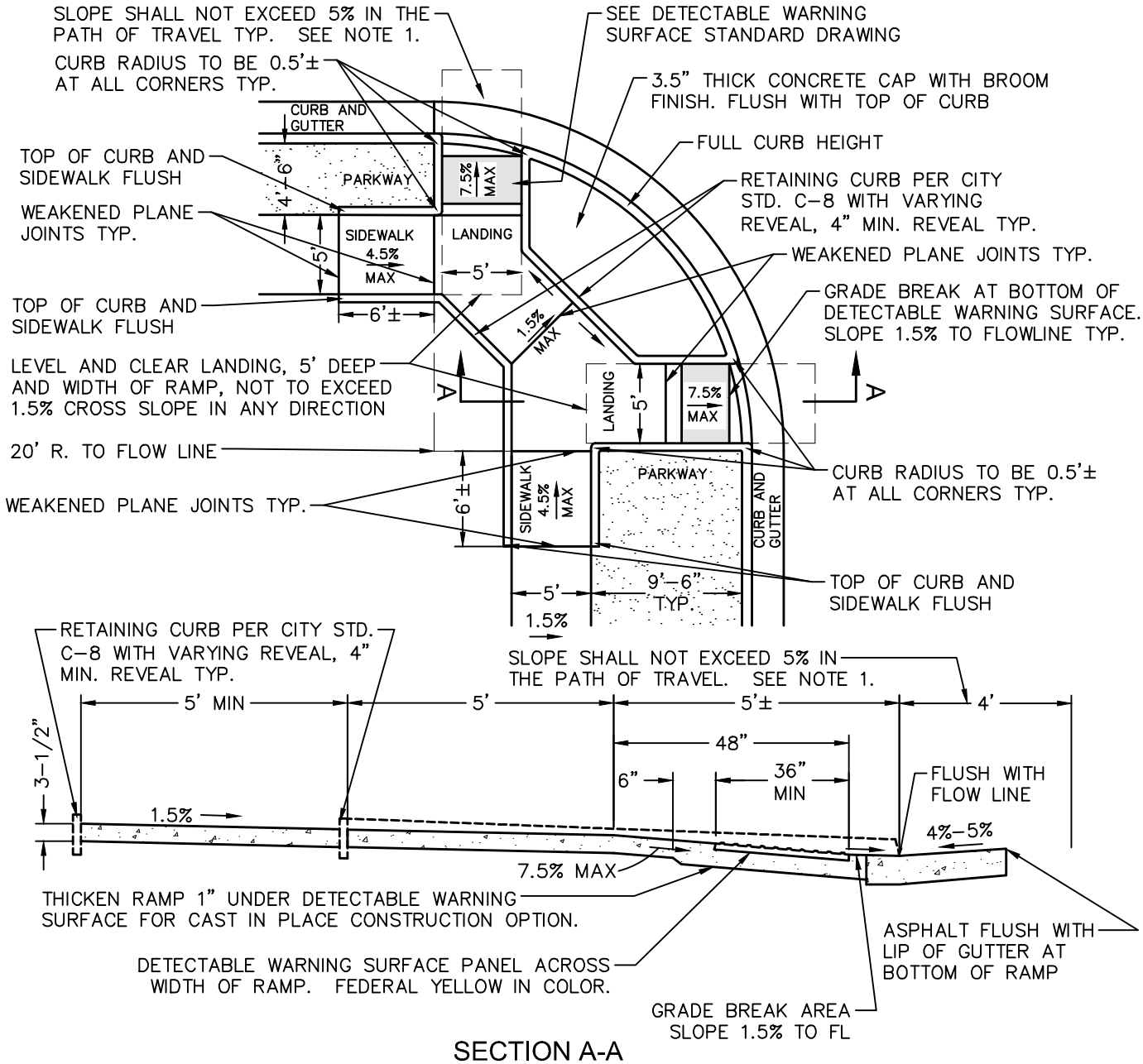
APPROVED BY: _____ 01/29/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

20' RADIUS CURB RETURN WITH DIRECTIONAL RAMPS – DETAIL 2

REVISIONS
01/29/25
BK 2016

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SECTION A-A

NOTES:

1. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE CURB AND GUTTER FLOWLINE
2. NO CROSS SLOPE IN THE PATH OF TRAVEL TO EXCEED 1.5% OR BE LESS THAN 1.0%
3. DEPRESSED CURB AND GUTTER LIPS AT RAMPS SHALL TRANSITION BACK TO NORMAL CURB AND GUTTER LIP SLOPES OVER A DISTANCE OF AROUND 5'
4. APPLICABLE TO LOCAL STREET INTERSECTIONS IN RESIDENTIAL AND OFFICE ZONES
5. THE DESIGN ENGINEER IS RESPONSIBLE FOR DESIGNING EACH RAMP AND ALL GRADES TO BE COMPLIANT WITH ADA AND PROWAG REQUIREMENTS
6. CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS C-1 AND C-3 FOR ADDITIONAL SPECIFICATIONS

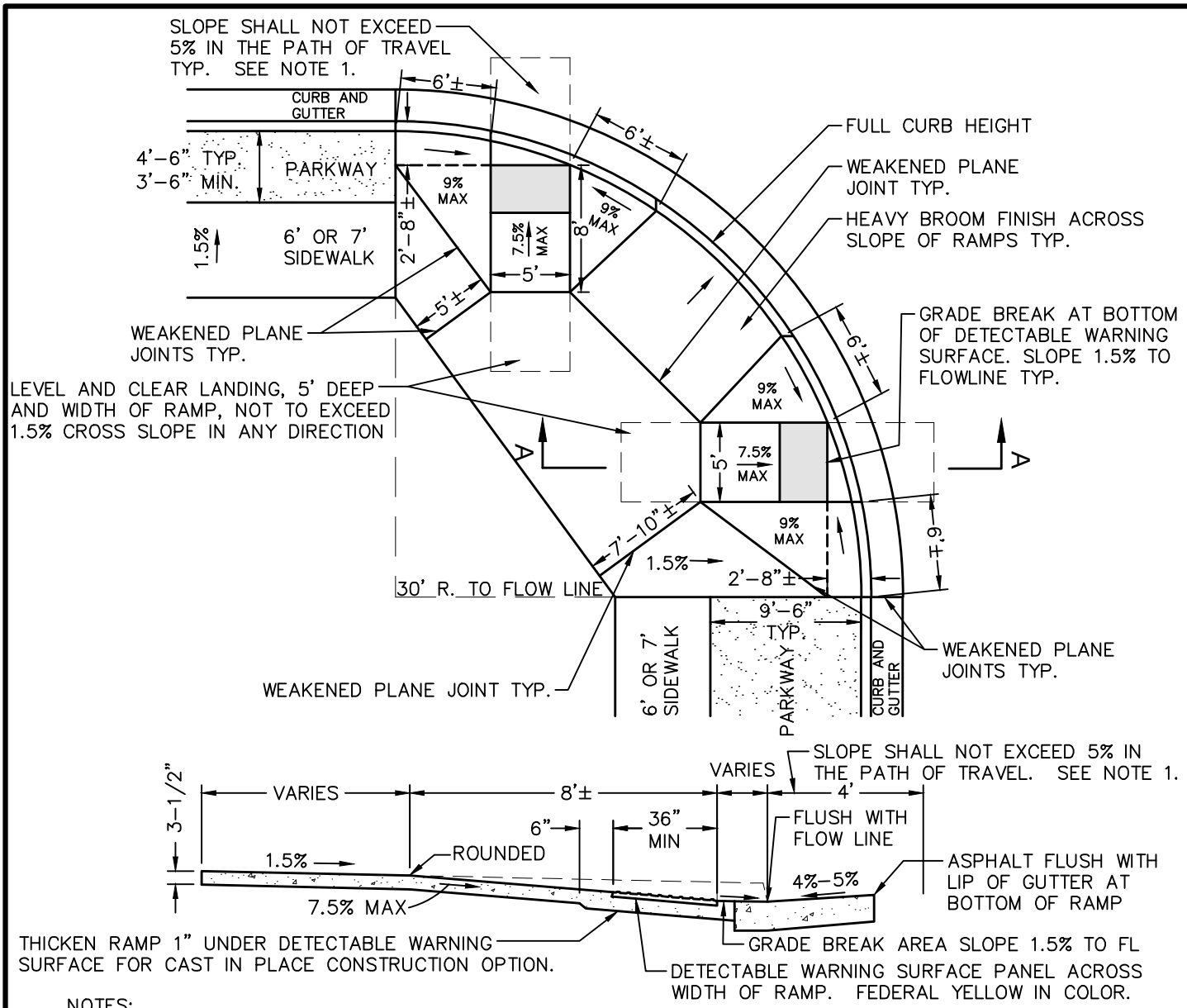
APPROVED BY: _____ 01/29/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

20' RADIUS CURB RETURN WITH DIRECTIONAL RAMPS – DETAIL 3

REVISIONS
01/29/25
BK 2016

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SECTION A-A

NOTES:

1. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE CURB AND GUTTER FLOWLINE
2. NO CROSS SLOPE IN THE PATH OF TRAVEL TO EXCEED 1.5% OR BE LESS THAN 1.0%
3. DEPRESSED CURB AND GUTTER LIPS AT RAMPS SHALL TRANSITION BACK TO NORMAL CURB AND GUTTER LIP SLOPES OVER A DISTANCE OF AROUND 5'
4. APPLICABLE TO LOCAL STREET INTERSECTIONS WITH COLLECTORS OR ARTERIALS.
5. APPLICABLE TO LOCAL STREET INTERSECTIONS IN INDUSTRIAL AND COMMERCIAL ZONES.
6. THE DESIGN ENGINEER IS RESPONSIBLE FOR DESIGNING EACH RAMP AND ALL GRADES TO BE COMPLIANT WITH ADA AND PROWAG REQUIREMENTS
7. CURB AND GUTTER AND CURB RETURN FLATWORK SHALL BE POURED MONOLITHICALLY UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER
8. CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS C-1 AND C-3 FOR ADDITIONAL SPECIFICATIONS

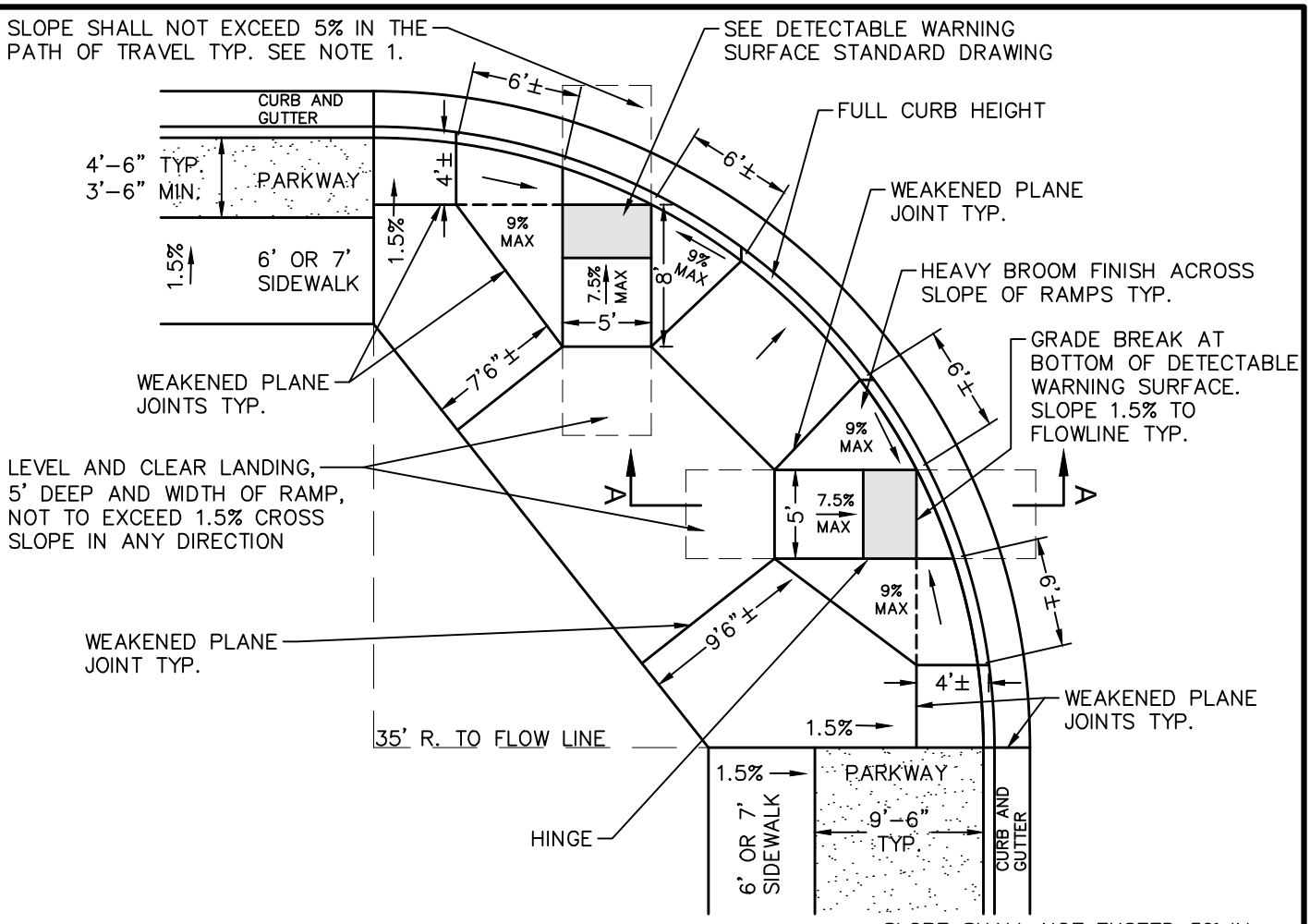
APPROVED BY: _____ 02/05/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

30' RADIUS CURB RETURN WITH DIRECTIONAL RAMPS

REVISIONS
02/05/25
BK 2016

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SECTION A-A

NOTES:

1. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE CURB AND GUTTER FLOWLINE
2. NO CROSS SLOPE IN THE PATH OF TRAVEL TO EXCEED 1.5% OR BE LESS THAN 1.0%
3. DEPRESSED CURB AND GUTTER LIPS AT RAMPS SHALL TRANSITION BACK TO NORMAL CURB AND GUTTER LIP SLOPES OVER A DISTANCE OF AROUND 5'
4. THE DESIGN ENGINEER IS RESPONSIBLE FOR DESIGNING EACH RAMP AND ALL GRADES TO BE COMPLIANT WITH ADA AND PROWAG REQUIREMENTS
5. CURB AND GUTTER AND CURB RETURN FLATWORK SHALL BE POURED MONOLITHICALLY UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER
6. CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS C–1 AND C–3 FOR ADDITIONAL SPECIFICATIONS

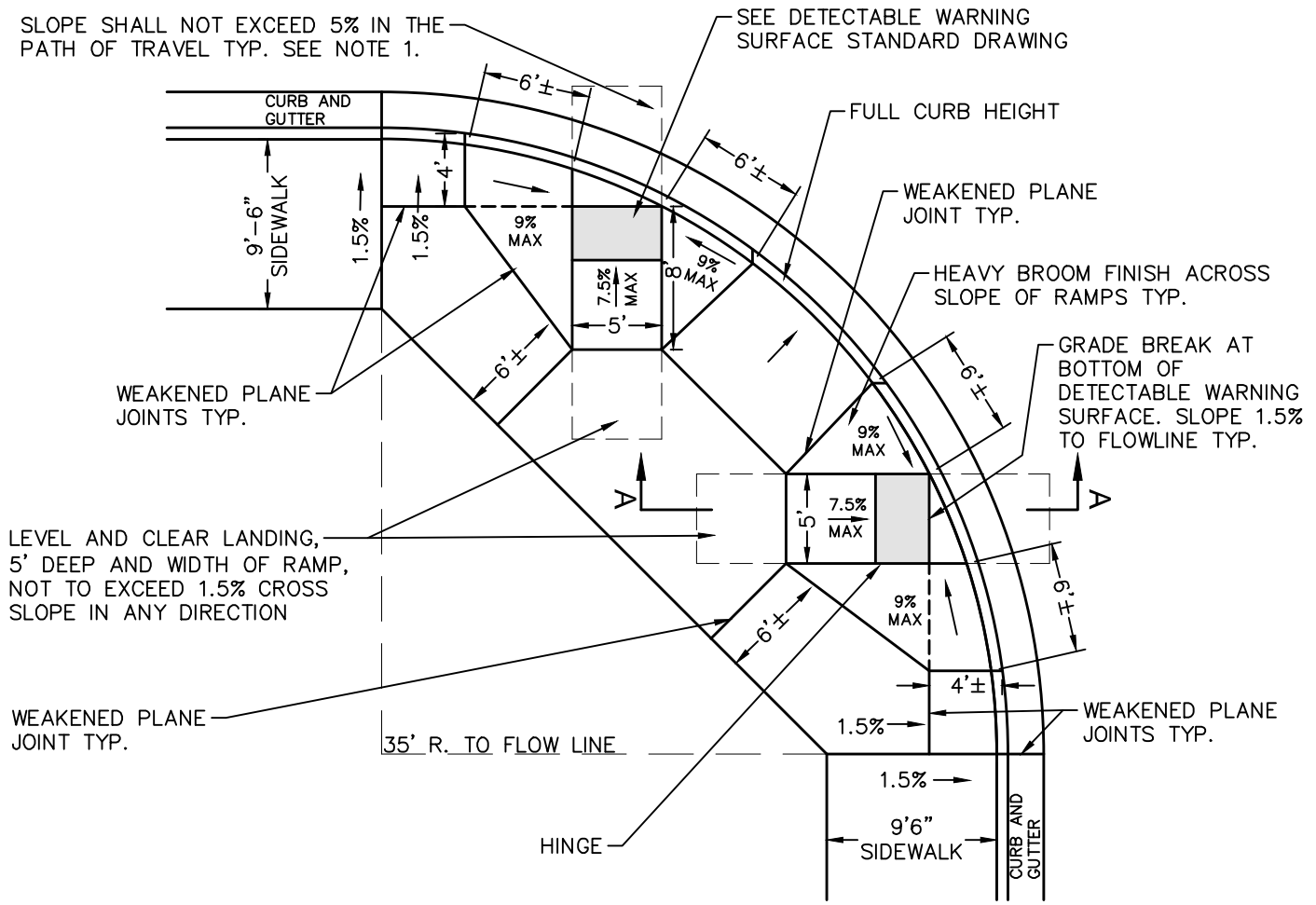
APPROVED BY: _____ CITY ENGINEER R.C.E. 71192 01/29/25 DATE

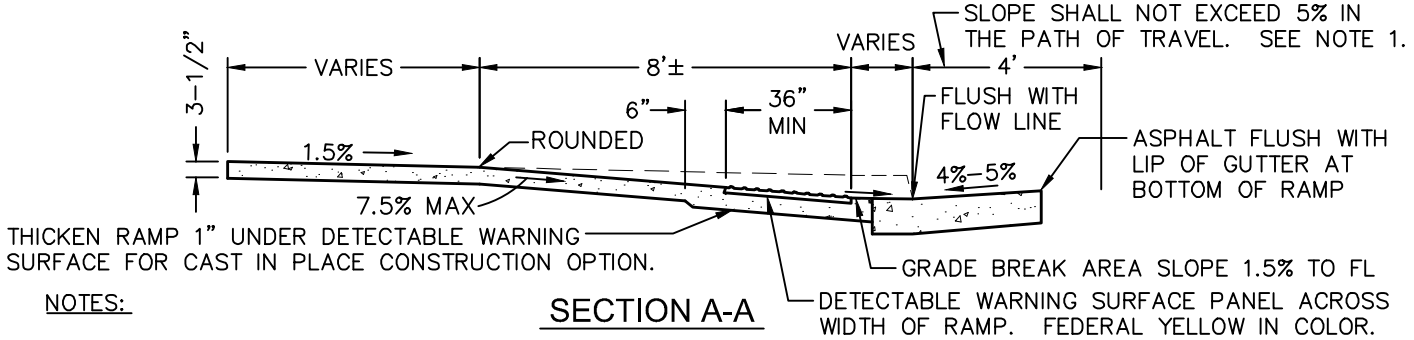
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

35' RADIUS CURB RETURN WITH DIRECTIONAL RAMPS – DETAIL 1

REVISIONS
01/29/25
BK 2016

C–17





SECTION A-A

NOTES:

1. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE BOTTOM OF THE CURB RAMP.
2. NO CROSS SLOPE IN THE PATH OF TRAVEL TO EXCEED 1.5% OR BE LESS THAN 1.0%
3. DEPRESSED CURB AND GUTTER LIPS AT RAMPS SHALL TRANSITION BACK TO NORMAL CURB AND GUTTER LIP SLOPES OVER A DISTANCE OF AROUND 5'
4. THE DESIGN ENGINEER IS RESPONSIBLE FOR DESIGNING EACH RAMP AND ALL GRADES TO BE COMPLIANT WITH ADA AND PROWAG REQUIREMENTS
5. CURB AND GUTTER AND CURB RETURN FLATWORK SHALL BE POURED MONOLITHICALLY UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER
6. CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS C-1 AND C-3 FOR ADDITIONAL SPECIFICATIONS

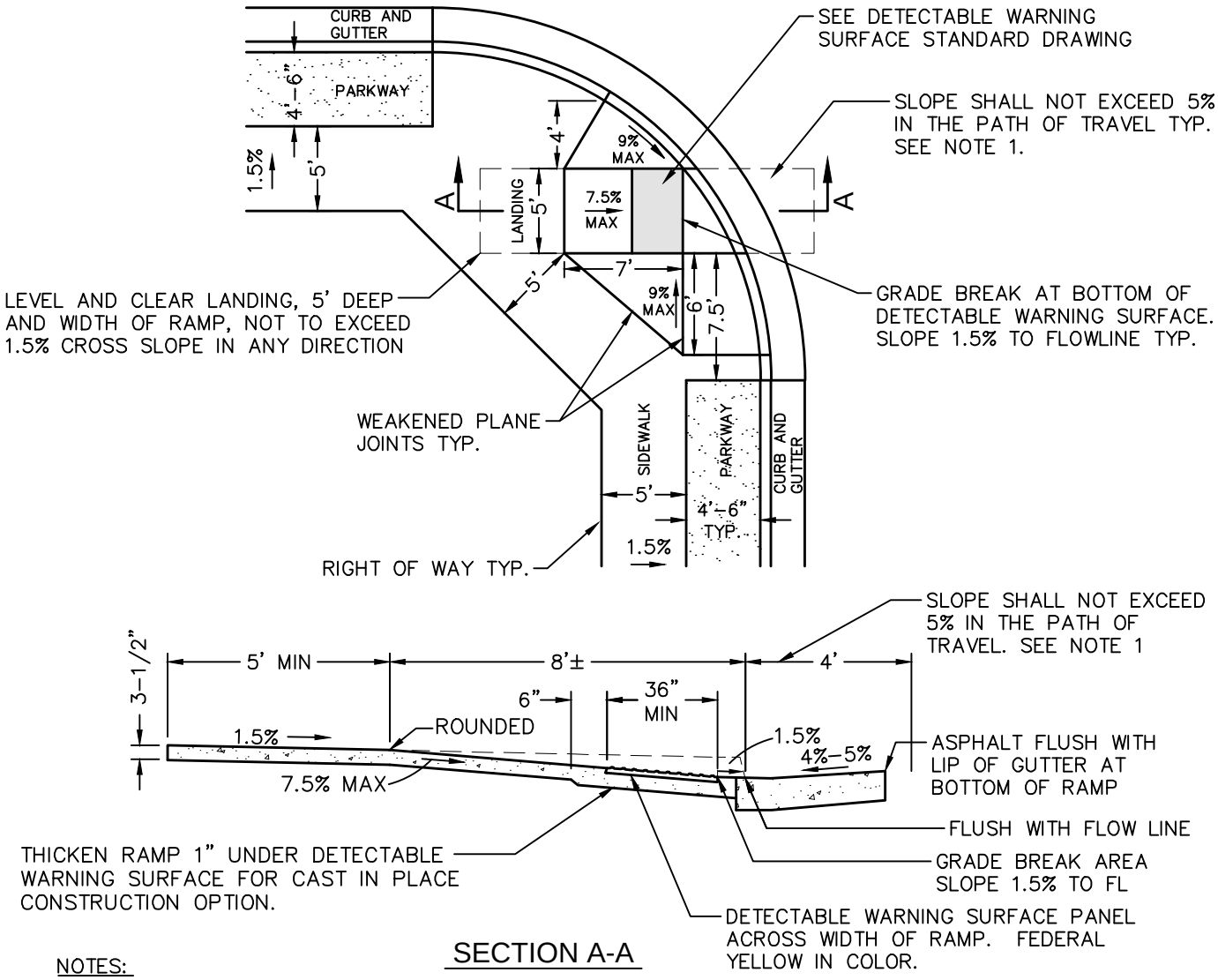
APPROVED BY: _____ 01/29/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

35' RADIUS CURB RETURN WITH DIRECTIONAL RAMPS – DETAIL 2

REVISIONS
01/29/25
BK 2016

C-18



SECTION A-A

NOTES:

1. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE CURB AND GUTTER FLOWLINE
2. NO CROSS SLOPE IN THE PATH OF TRAVEL TO EXCEED 1.5% OR BE LESS THAN 1.0%
3. DEPRESSED CURB AND GUTTER LIPS AT RAMPS SHALL TRANSITION BACK TO NORMAL CURB AND GUTTER LIP SLOPES OVER A DISTANCE OF AROUND 5'
4. APPLICABLE TO LOCAL STREET INTERSECTIONS IN RESIDENTIAL AND OFFICE ZONES
5. THE DESIGN ENGINEER IS RESPONSIBLE FOR DESIGNING EACH RAMP AND ALL GRADES TO BE COMPLIANT WITH ADA AND PROWAG REQUIREMENTS
6. THIS DETAIL SHALL ONLY BE USED WHERE THERE IS A SINGLE PEDESTRIAN CROSSING AND WHERE IT IS APPROVED BY THE CITY ENGINEER
7. CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS C–1 AND C–3 FOR ADDITIONAL SPECIFICATIONS

APPROVED BY: _____ 04/11/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

20' RADIUS CURB RETURN WITH SINGLE DIRECTIONAL RAMP

REVISIONS
04/11/25
BK 2016

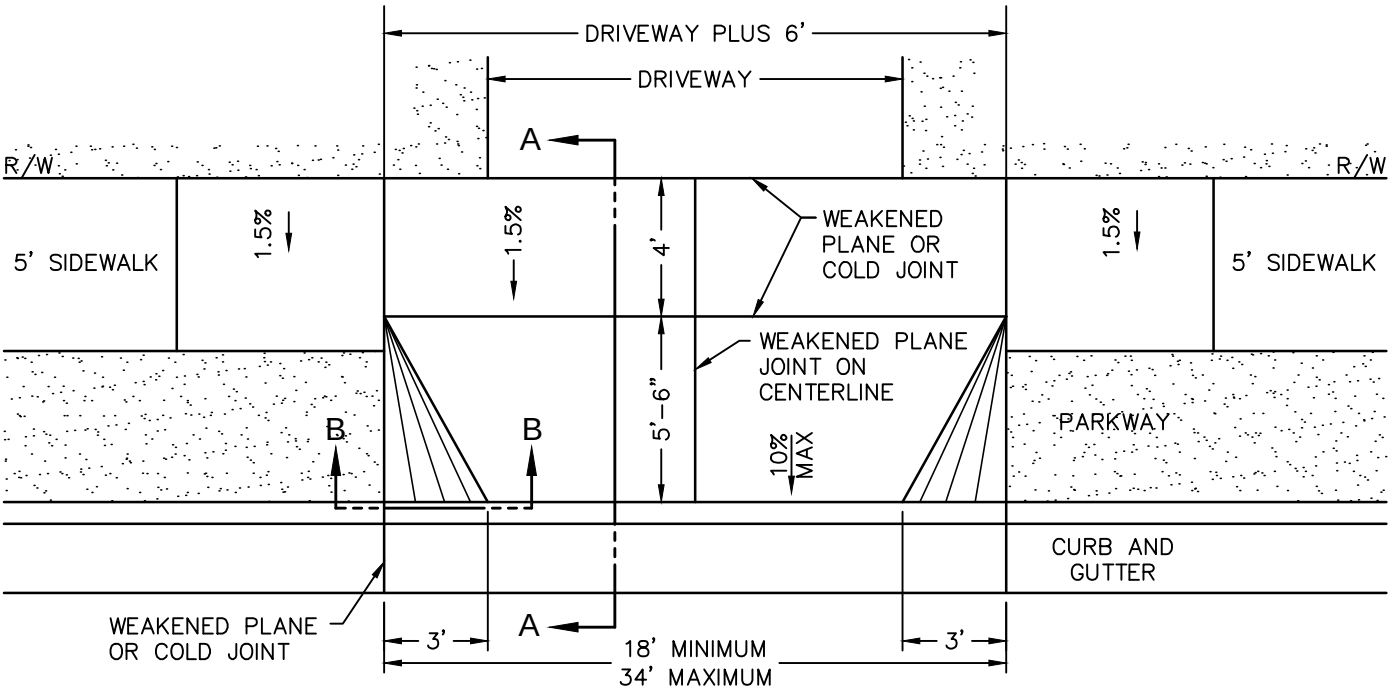
C–19

RESERVED FOR FUTURE DETAIL

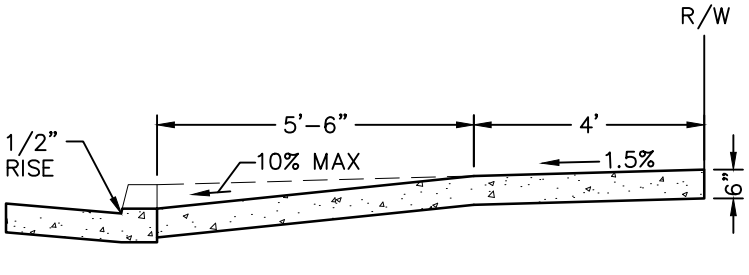
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RESERVED	REVISIONS BK 2016
	C-20

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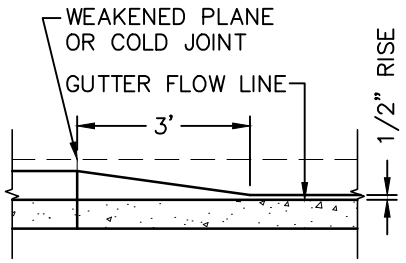
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RESERVED	REVISIONS BK 2016
	C-21



PLAN



SECTION A-A

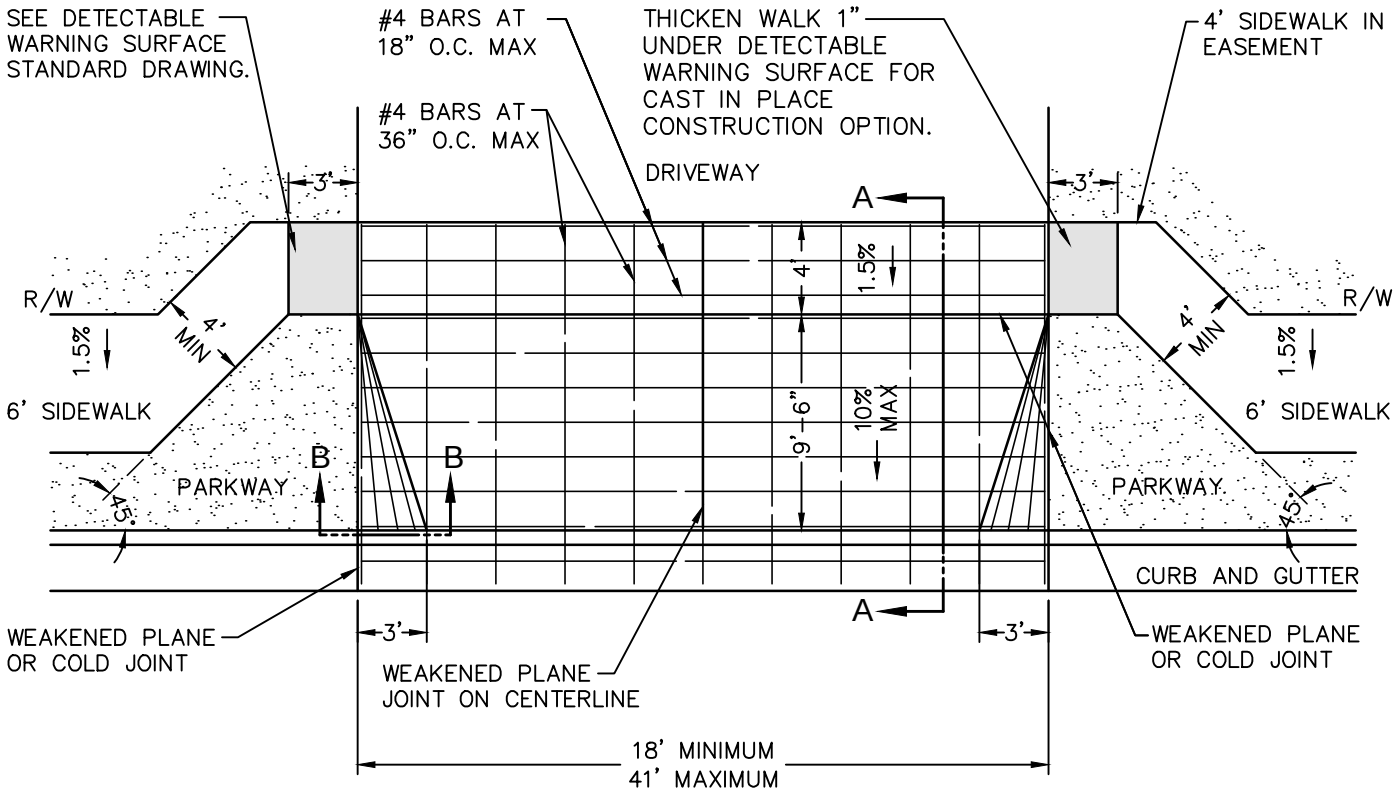


SECTION B-B

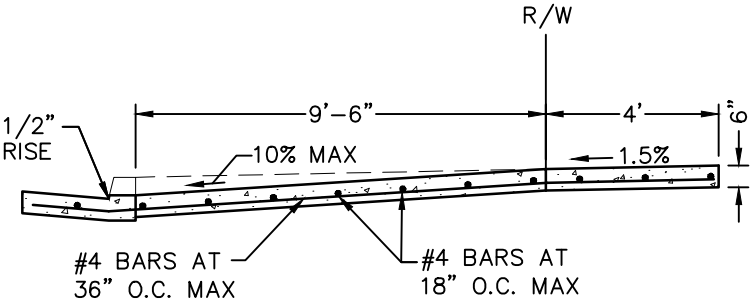
NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. DRIVE APPROACHES SHALL BE NO GREATER THAN 6' WIDER THAN THE DRIVEWAY.

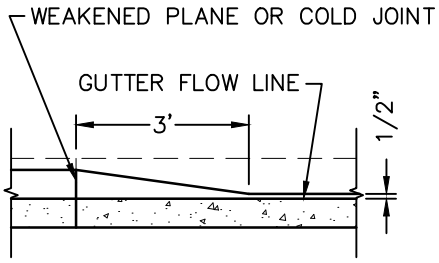
APPROVED BY: CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESIDENTIAL DRIVE APPROACH	REVISIONS 07/11/16 BK 2016 / C-22



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. ON COLLECTOR AND ARTERIAL STREETS, THE MINIMUM DRIVE APPROACH WIDTH SHALL BE 21' FOR ONE-WAY DRIVE APPROACHES AND 36' FOR TWO-WAY DRIVE APPROACHES, OR AS APPROVED BY CITY ENGINEER.
3. REBAR SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REBAR SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
4. REBAR SHALL HAVE A MINIMUM OF 2" OF CLEAR COVERAGE.
5. NOT MORE THAN 50% OF PROPERTY FRONTAGE SHALL BE USED AS DRIVE APPROACH.
6. WIDTH AND LOCATION OF DRIVE APPROACHES ON STATE ROUTES IS SUBJECT TO APPROVAL BY CALTRANS.

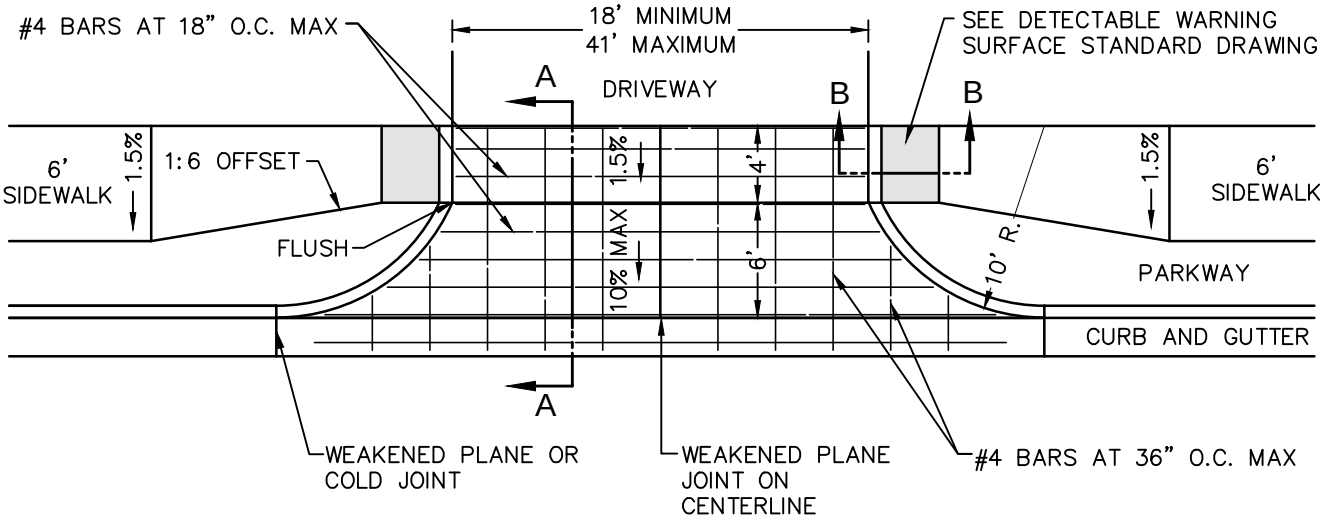
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

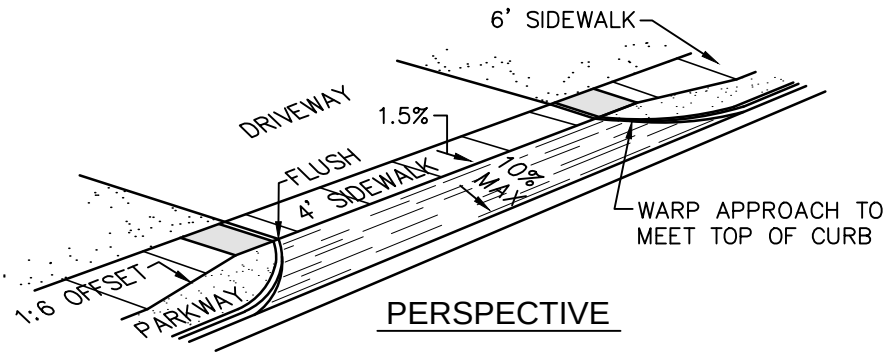
MULTI-FAMILY RESIDENTIAL/OFFICE /COMMERCIAL DRIVE APPROACH

REVISIONS
09/15/16
BK 2016

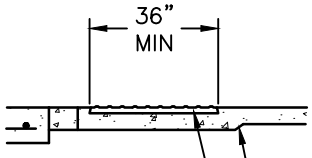
C-23



PLAN

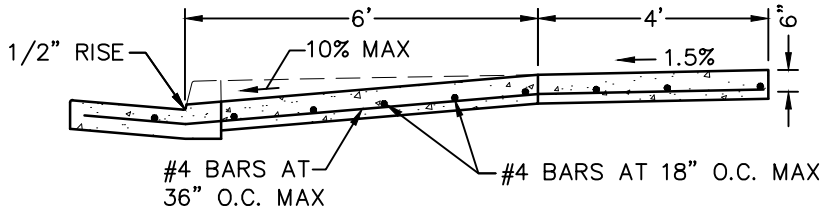


PERSPECTIVE



DETECTABLE WARNING SURFACE PANEL ACROSS WIDTH OF WALK. FEDERAL YELLOW IN COLOR.

THICKEN WALK 1" UNDER DETECTABLE WARNING SURFACE FOR CAST IN PLACE CONSTRUCTION OPTION.



SECTION A-A

SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. ON COLLECTOR AND ARTERIAL STREETS, THE MINIMUM DRIVE APPROACH WIDTH SHALL BE 21' FOR ONE-WAY DRIVE APPROACHES AND 36' FOR TWO-WAY DRIVE APPROACHES, OR AS APPROVED BY CITY ENGINEER.
3. REBAR SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REBAR SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
4. REBAR SHALL HAVE A MINIMUM OF 2" OF CLEAR COVERAGE.
5. NOT MORE THAN 50% OF PROPERTY FRONTAGE SHALL BE USED AS DRIVE APPROACH.
6. WIDTH AND LOCATION OF DRIVE APPROACHES ON STATE ROUTES IS SUBJECT TO APPROVAL BY CALTRANS.

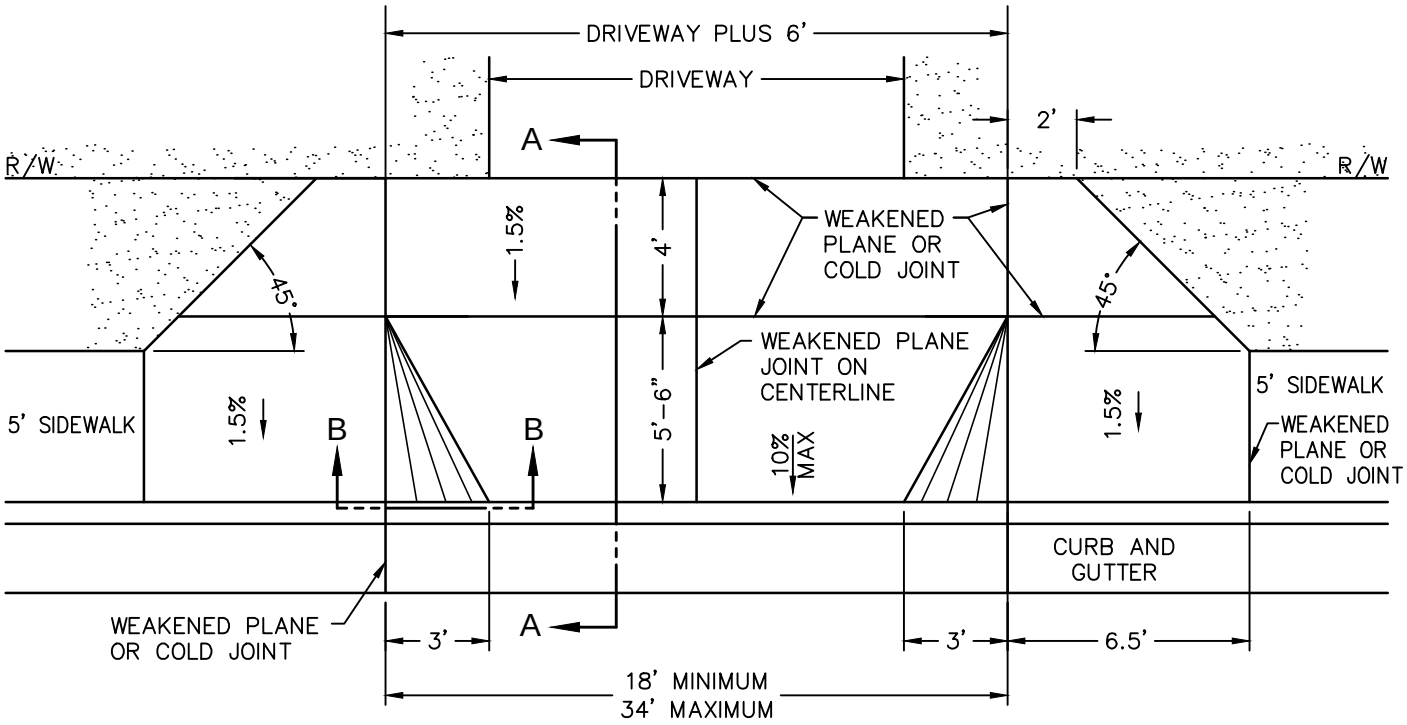
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

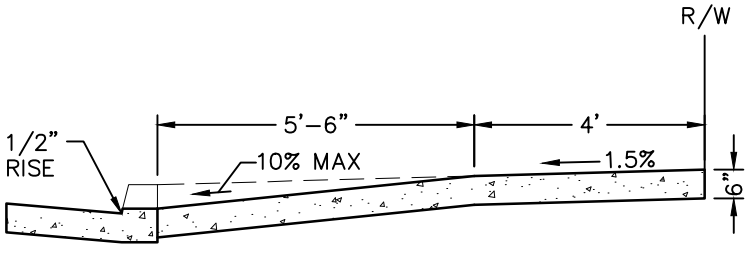
OFFICE/COMMERCIAL DRIVE APPROACH (ALTERNATIVE – WITH CURB RETURNS)

REVISIONS
09/15/16
BK 2016

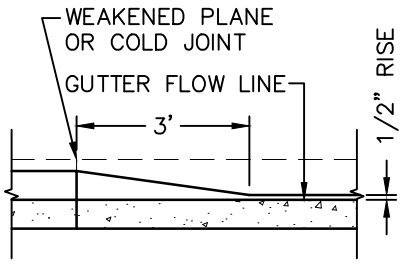
C-24



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. DRIVE APPROACHES SHALL BE NO GREATER THAN 6' WIDER THAN THE DRIVEWAY.

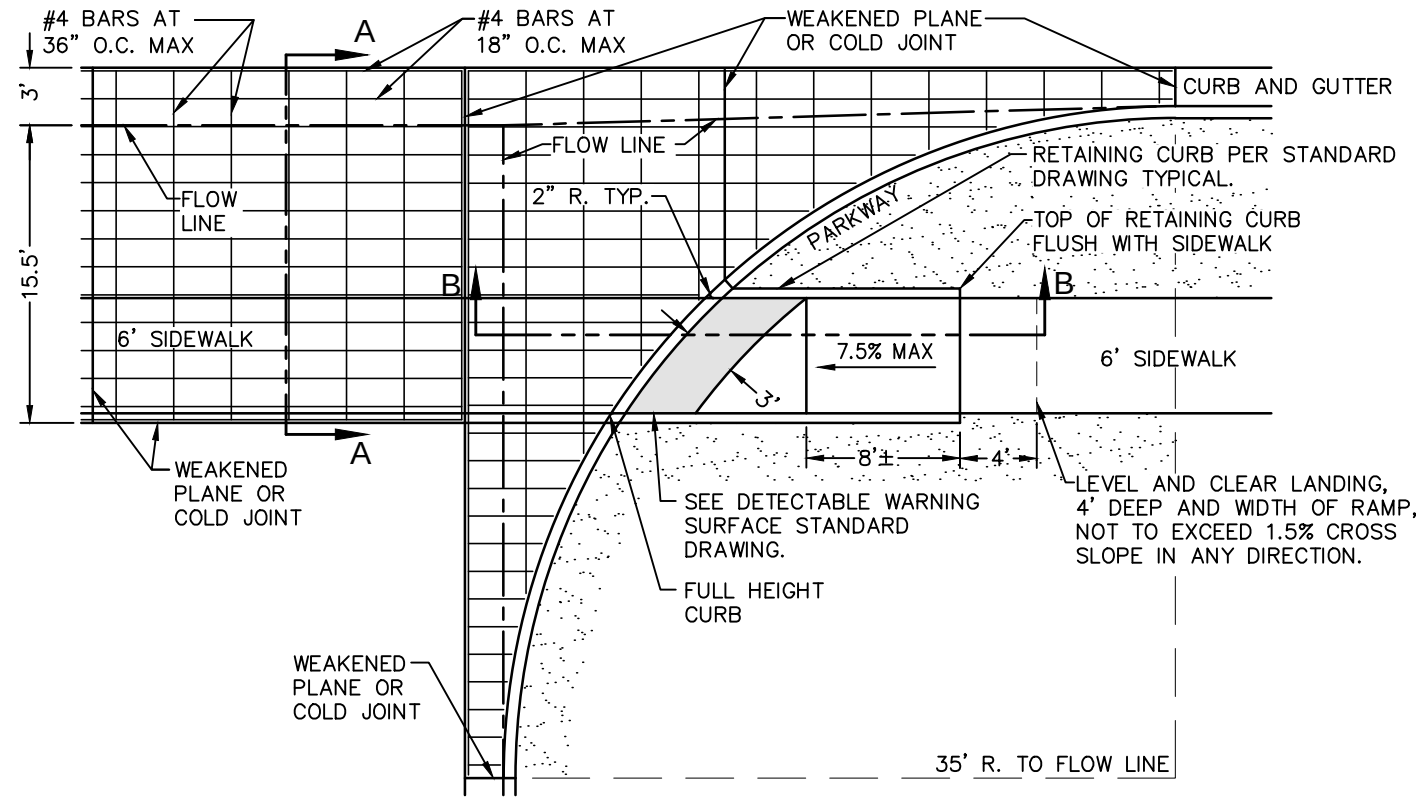
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

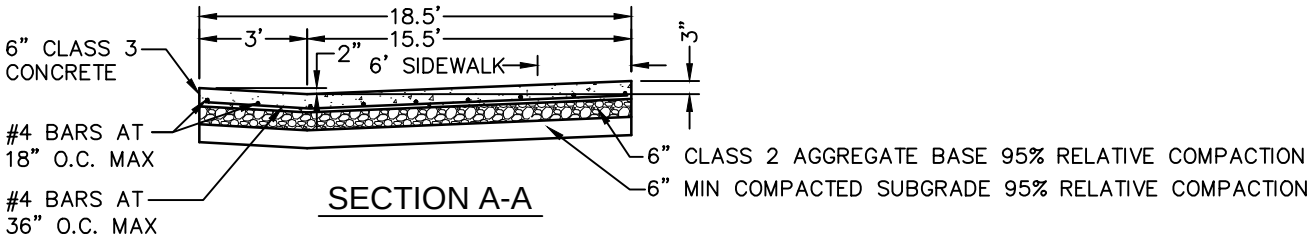
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

RESIDENTIAL DRIVE APPROACH WITH ADJACENT SIDEWALK (INFILL ONLY)

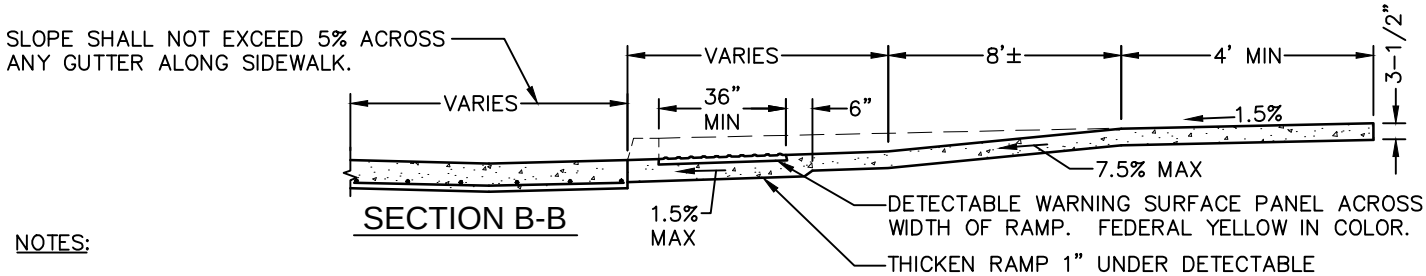
REVISIONS
07/11/16
BK 2016

C-25





SECTION A-A



SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. COMMERCIAL DRIVE APPROACH SHALL HAVE A MINIMUM GRADIENT OF 0.40%. MINIMUM GRADIENT ON INFILL PROJECTS MAY BE LESS AS APPROVED BY THE CITY ENGINEER.
3. REBAR SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REBAR SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
4. REBAR SHALL HAVE A MINIMUM 2" OF CLEAR COVERAGE.
5. GUTTER FLOW LINE SHALL BE WATER TESTED FOR FLOW.
6. PROVIDE A MINIMUM 6' SIDEWALK ACROSS DRIVE. MAXIMUM 1.5% CROSS SLOPE AND MAXIMUM 1.5% SLOPE IN THE DIRECTION OF SIDEWALK.
7. NO CROSS SLOPE IN THE PEDESTRIAN ACCESS ROUTE TO EXCEED 1.5%.

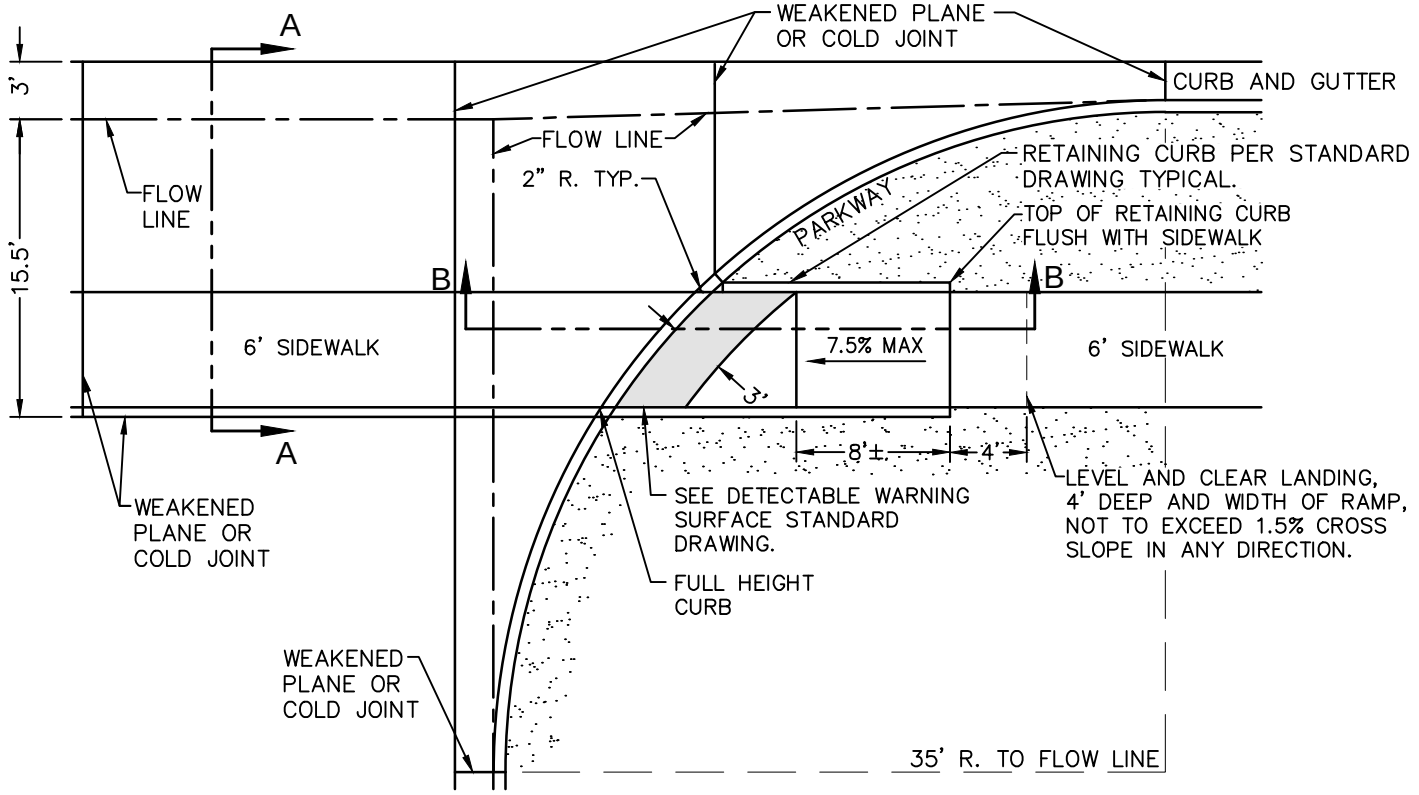
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

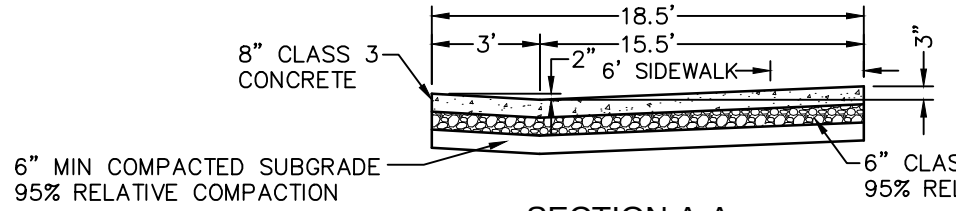
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

MAJOR COMMERCIAL DRIVE APPROACH 35' RADIUS CURB RETURN

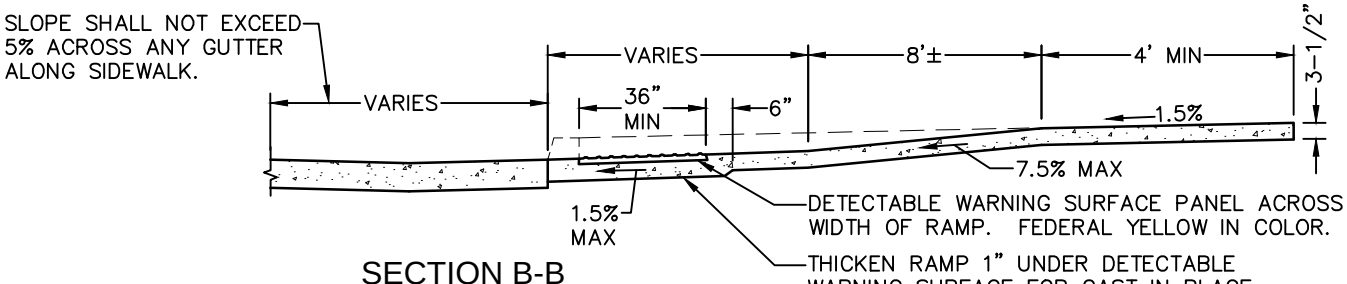
REVISIONS
09/15/16
BK 2016

C–26





SECTION A-A



SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. COMMERCIAL DRIVE APPROACH GUTTER SHALL HAVE A MINIMUM GRADIENT OF 0.40%. MINIMUM GRADIENT ON INFILL PROJECTS MAY BE LESS AS APPROVED BY THE CITY ENGINEER.
3. GUTTER FLOW LINE SHALL BE WATER TESTED FOR FLOW.
4. NO CROSS SLOPE IN THE PEDESTRIAN ACCESS ROUTE TO EXCEED 1.5%.
5. PROVIDE A MINIMUM 6' SIDEWALK ACROSS DRIVE. MAXIMUM 1.5% CROSS SLOPE AND MAXIMUM 1.5% SLOPE IN THE DIRECTION OF SIDEWALK.

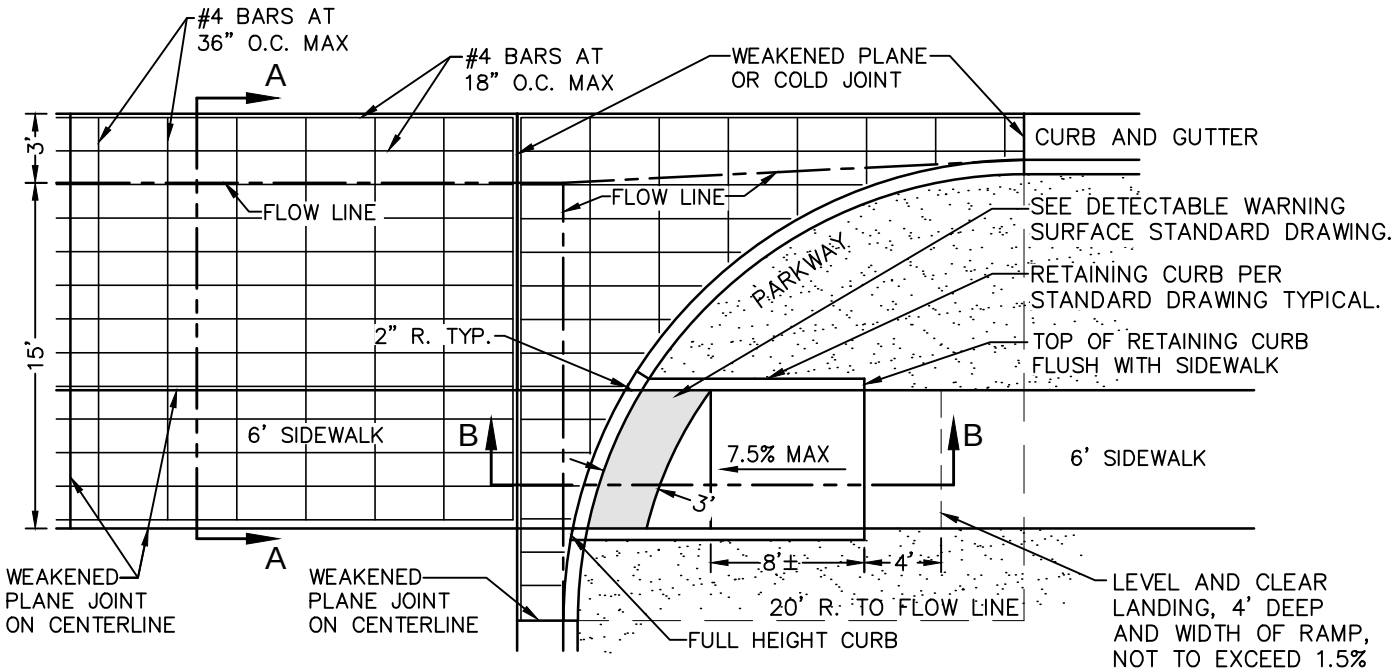
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE

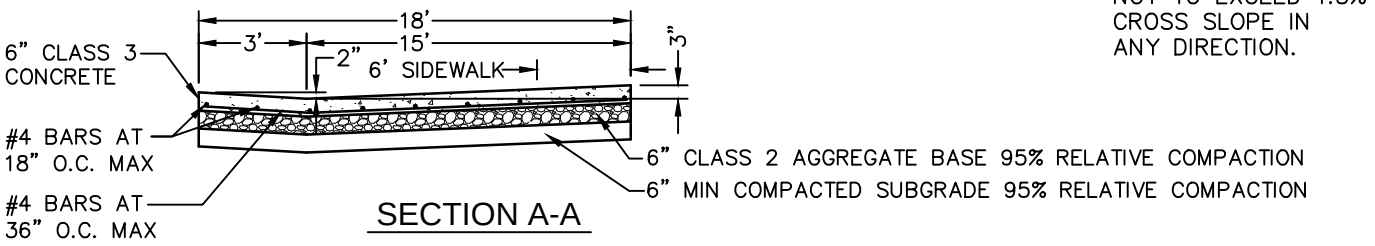
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

MAJOR COMMERCIAL DRIVE APPROACH 35' RADIUS CURB RETURN–ALTERNATE

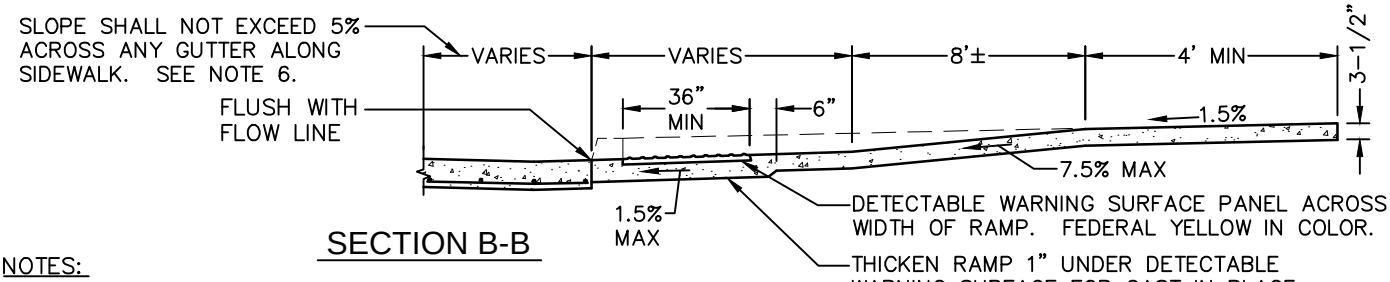
REVISIONS
09/15/16
BK 2016

C–27





SECTION A-A



SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. COMMERCIAL DRIVE APPROACH SHALL HAVE A MINIMUM GRADIENT OF 0.40%. MINIMUM GRADIENT ON INFILL PROJECTS MAY BE LESS AS APPROVED BY THE CITY ENGINEER.
3. REBAR SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REBAR SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
4. REBAR SHALL HAVE A MINIMUM OF 2" OF CLEAR COVERAGE.
5. GUTTER FLOW LINE SHALL BE WATER TESTED FOR FLOW.
6. MAXIMUM SLOPES OF ADJOINING GUTTERS IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE BOTTOM OF THE CURB RAMP.
7. NO CROSS SLOPE IN THE PEDESTRIAN ACCESS ROUTE TO EXCEED 1.5%.
8. PROVIDE A MINIMUM 6' SIDEWALK ACROSS DRIVE. MAXIMUM 1.5% CROSS SLOPE AND MAXIMUM 1.5% SLOPE IN THE DIRECTION OF SIDEWALK.

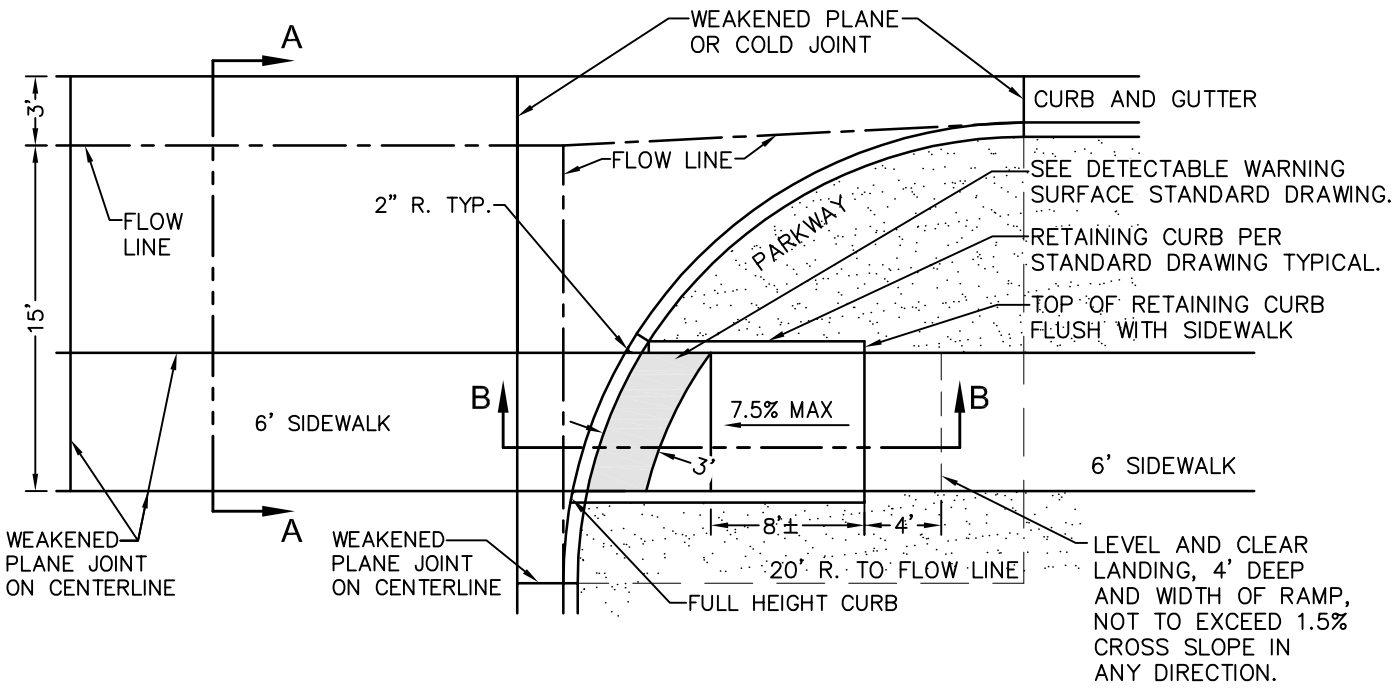
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

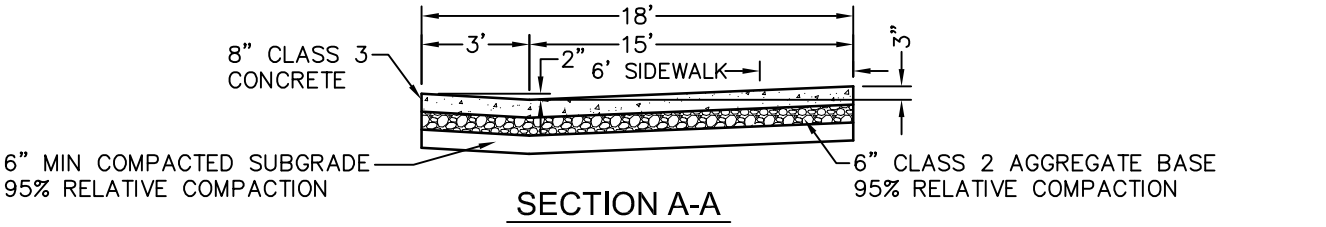
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

MAJOR COMMERCIAL DRIVE APPROACH 20' RADIUS CURB RETURN

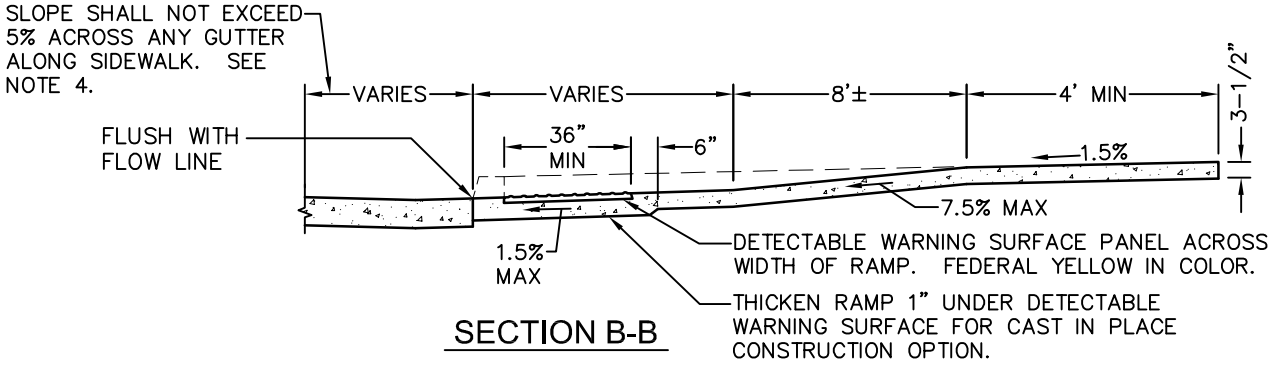
REVISIONS
09/15/16
BK 2016

C-28





SECTION A-A



SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. COMMERCIAL DRIVE APPROACH GUTTER SHALL HAVE A MINIMUM GRADIENT OF 0.40%. MINIMUM GRADIENT ON INFILL PROJECTS MAY BE LESS AS APPROVED BY THE CITY ENGINEER.
3. GUTTER FLOW LINE SHALL BE WATER TESTED FOR FLOW.
4. MAXIMUM SLOPES OF ADJOINING GUTTERS IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5% WITHIN 4' OF THE BOTTOM OF THE CURB RAMP.
5. NO CROSS SLOPE IN THE PEDESTRIAN ACCESS ROUTE TO EXCEED 1.5%.
6. PROVIDE A MINIMUM 6' SIDEWALK ACROSS DRIVE. MAXIMUM 1.5% CROSS SLOPE AND MAXIMUM 1.5% SLOPE IN THE DIRECTION OF SIDEWALK.

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

MAJOR COMMERCIAL DRIVE APPROACH 20' RADIUS CURB RETURN–ALTERNATE

REVISIONS
10/28/16
BK 2016

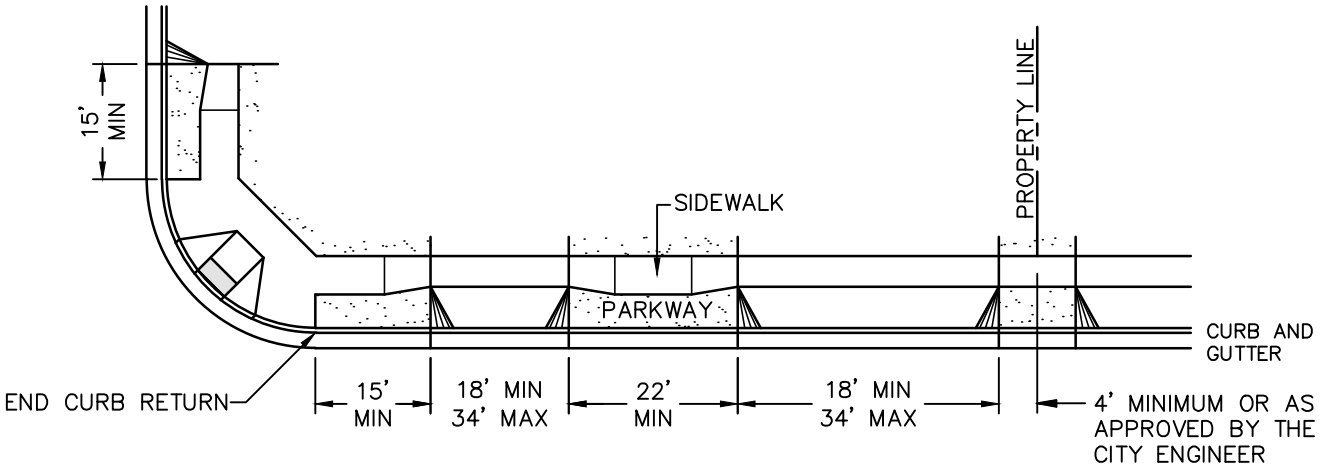
C–29

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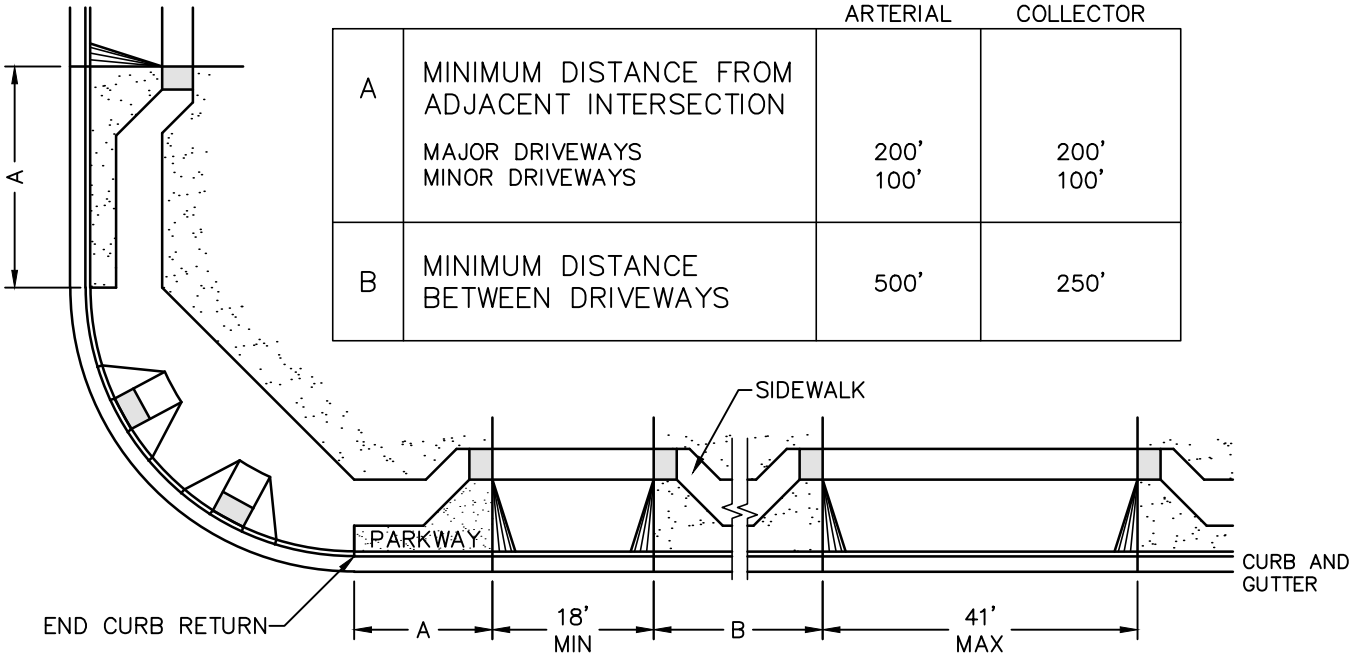
APPROVED BY: _____ _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS BK 2016
	C-30

RESERVED FOR FUTURE DETAIL

APPROVED BY:_____ _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS BK 2016
	C-31



DRIVE APPROACH LOCATIONS
RESIDENTIAL ZONES WITH 4 UNITS OR LESS PER LOT



		ARTERIAL	COLLECTOR
A	MINIMUM DISTANCE FROM ADJACENT INTERSECTION		
	MAJOR DRIVEWAYS	200'	200'
	MINOR DRIVEWAYS	100'	100'
B	MINIMUM DISTANCE BETWEEN DRIVEWAYS	500'	250'

DRIVE APPROACH LOCATIONS
OFFICE / COMMERCIAL / MULTI FAMILY ZONES

NOTES:

1. ON COLLECTOR AND ARTERIAL STREETS, THE MINIMUM DRIVE APPROACH WIDTH SHALL BE 21' FOR ONE-WAY DRIVE APPROACHES AND 36' FOR TWO-WAY DRIVE APPROACHES, OR AS APPROVED BY CITY ENGINEER.
2. NOT MORE THAN 50% OF PROPERTY FRONTAGE SHALL BE USED AS DRIVE APPROACH.
3. DRIVEWAYS SHOULD BE CONSOLIDATED WHENEVER POSSIBLE TO PROVIDE THE MINIMUM DISTANCE BETWEEN DRIVEWAYS AS SHOWN IN 'B' ABOVE.
4. DRIVEWAYS FROM RESIDENTIAL PROPERTIES TO ARTERIAL STREETS ARE DISCOURAGED. RESIDENTIAL PROPERTIES SHOULD RECEIVE ACCESS TO ARTERIALS FROM COLLECTOR STREETS AND LOCAL STREETS.
5. WIDTH AND LOCATION OF DRIVE APPROACHES ON STATE ROUTES IS SUBJECT TO CALTRANS APPROVAL.
6. NO VEHICULAR TRAFFIC SHALL CROSS CURB, GUTTER, OR SIDEWALK WITHOUT AN APPROVED DRIVE APPROACH.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

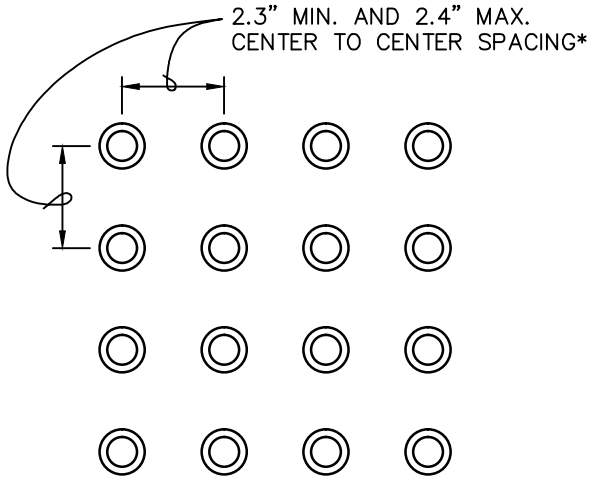
DRIVE APPROACH LOCATIONS

REVISIONS
06/14/13
BK 2016

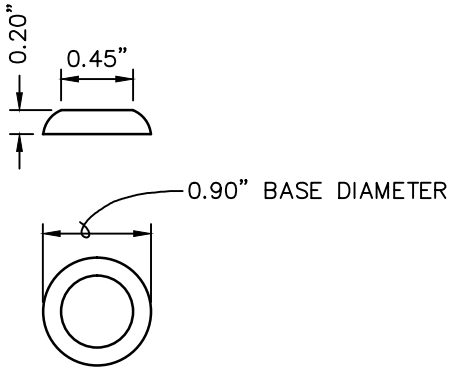
C-32

NOTE:

* WHERE INSTALLED IN A RADIAL PATTERN, TRUNCATED DOMES SHALL HAVE A CENTER TO CENTER SPACING OF 1.6" MINIMUM TO 2.4" MAXIMUM OR AS INDICATED PER CURRENT CBC.



RAISED TRUNCATED DOME PATTERN



RAISED TRUNCATED DOME

NOTES:

1. DETECTABLE WARNING SURFACE SHALL BE INSTALLED AT THE BOTTOM OF ALL CURB RAMPS.
2. DETECTABLE WARNING SHALL BE INSTALLED SO THAT IT BUTTS UP FLUSH AGAINST THE BACK OF ADJACENT CURB. WHERE CURBS ARE ON A CURVE, THE BACK OF CURB SHALL BE STRAIGHTENED AT THE DETECTABLE WARNING LOCATION SO THE WARNING BUTTS UP FLUSH AGAINST THE BACK OF CURB.
3. DETECTABLE WARNING SURFACE SHALL BE THE FULL WIDTH OF RAMP AND SHALL BE A MINIMUM OF 36" IN DEPTH.
4. DETECTABLE WARNING SURFACE SHALL BE PREMIXED FEDERAL YELLOW COLORED AND SHALL BE AN AUTHORIZED MATERIAL FROM THE CITY OF VISALIA DETECTABLE WARNING SURFACE AUTHORIZED MATERIAL LIST.
5. IN RETROFIT TYPE SITUATIONS ON EXISTING SURFACES THE CITY WILL ALLOW RETROFIT TYPE WARNING PANELS. RETROFIT PANEL MATERIALS SHALL BE SUBMITTED TO THE CITY ENGINEER FOR ACCEPTANCE PRIOR TO CONSTRUCTION. PANELS SHALL BE GLUED AND BOLTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. BOTTOM OF PANELS SHALL BE FLUSH AGAINST THE ADJACENT CONCRETE SURFACE.

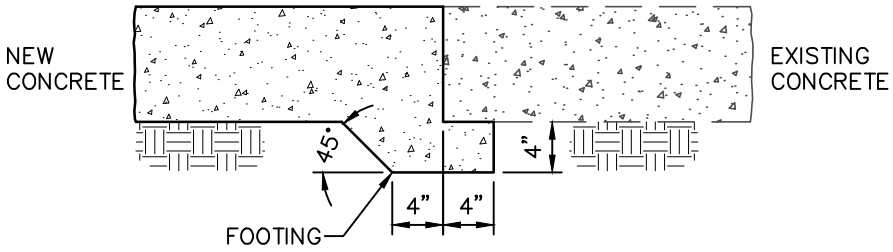
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

DETECTABLE WARNING SURFACE DETAIL

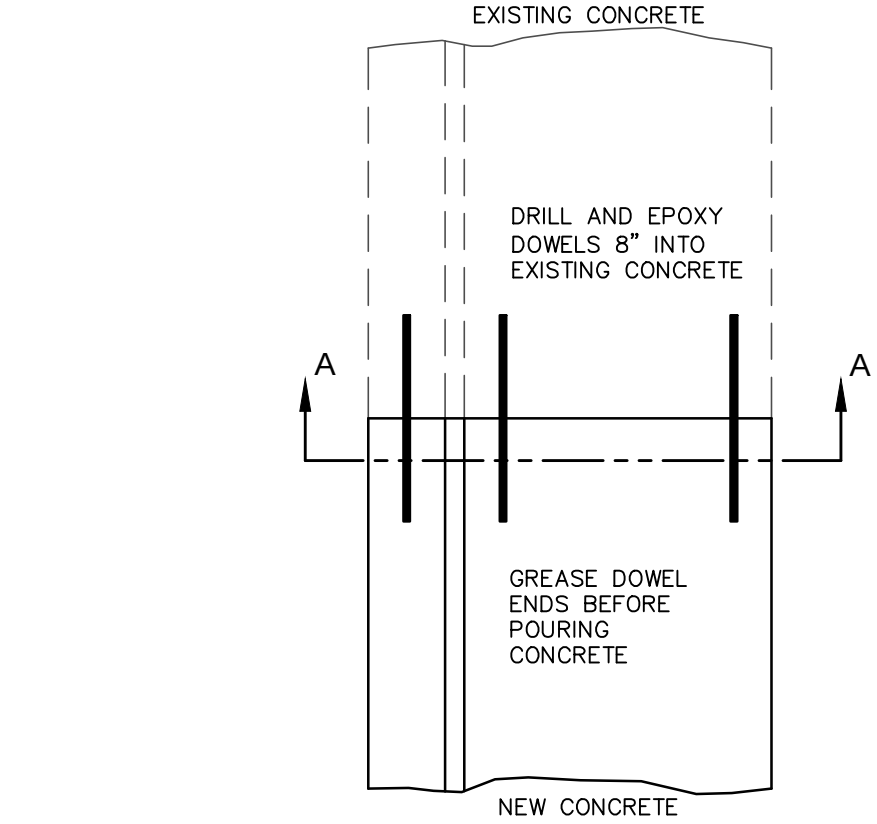
REVISIONS
09/15/16
BK 2016

C–33

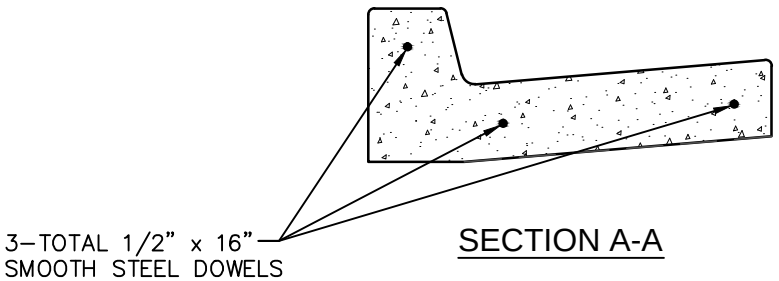


SECTION

CONCRETE FLATWORK



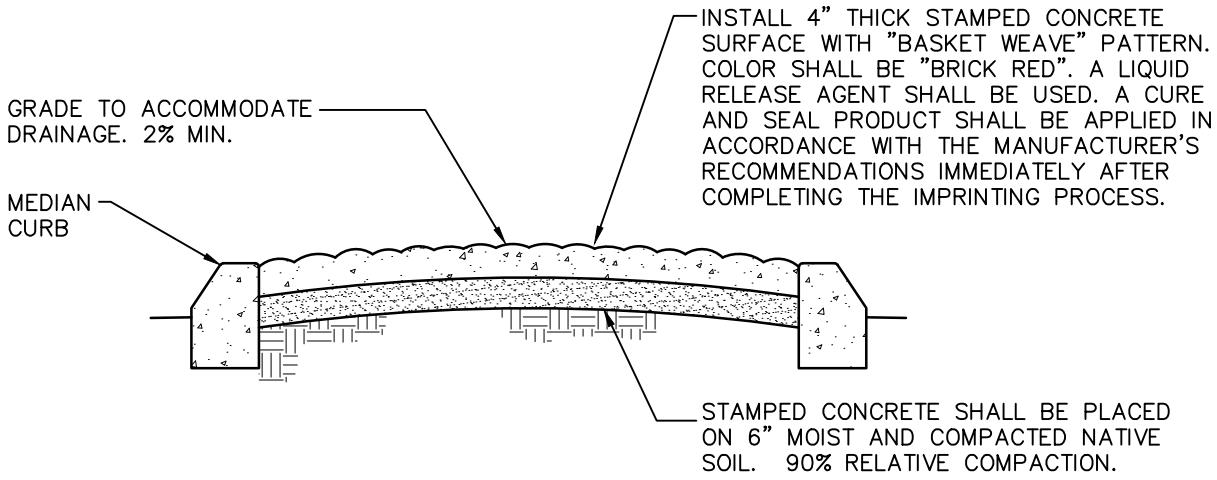
PLAN



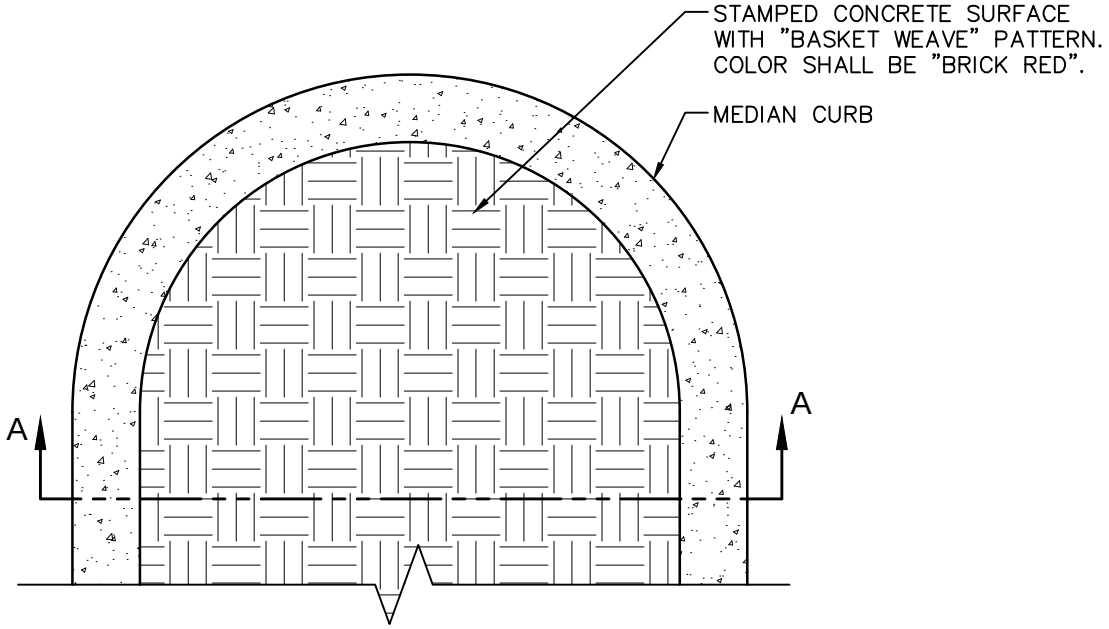
SECTION A-A

CONCRETE CURBING

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
CONCRETE COLD JOINTS	REVISIONS 10/23/12 BK 2016
	C–34



SECTION A-A

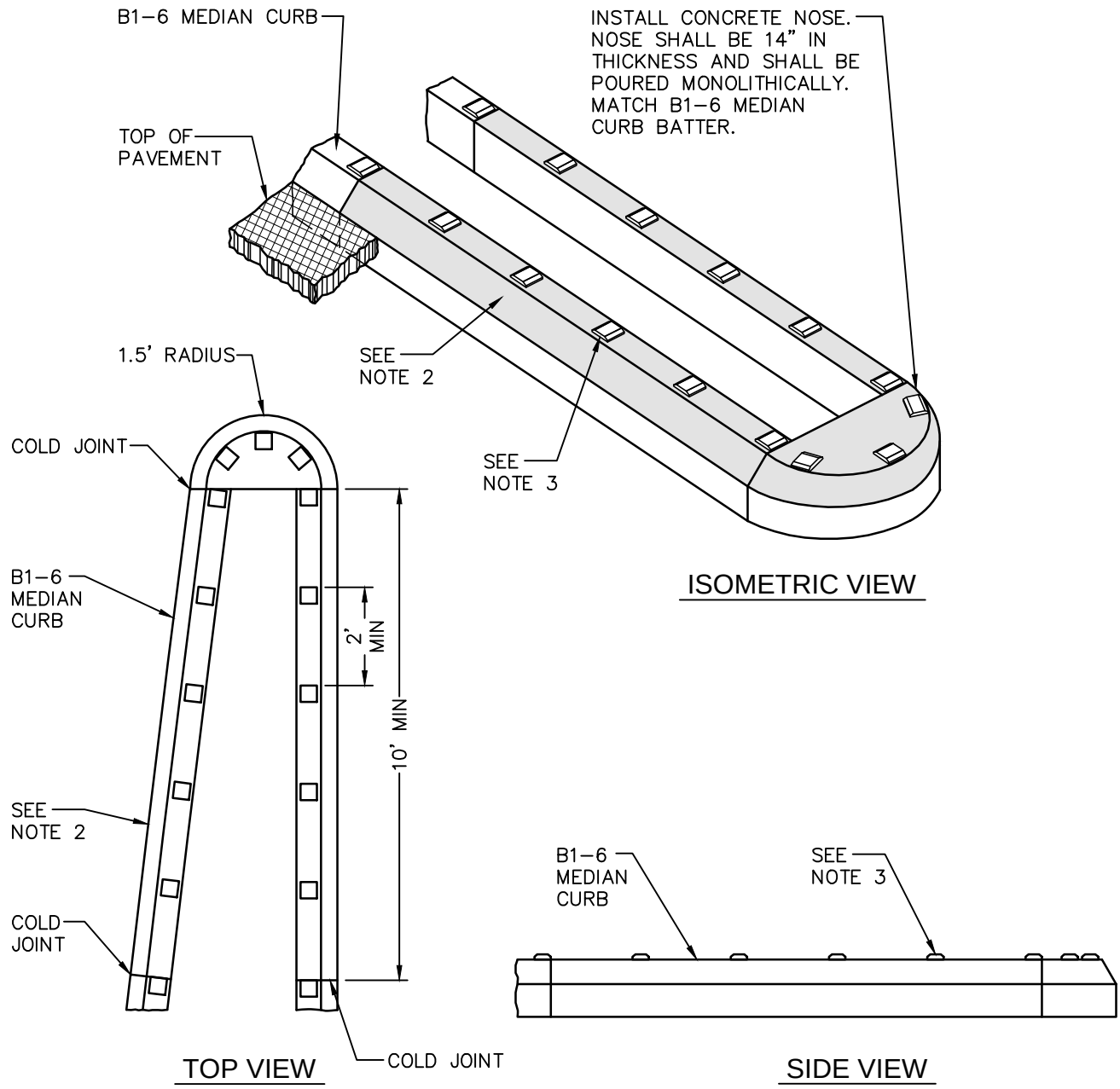


PLAN

NOTES:

1. WHEN MATCHING AN EXISTING COBBLESTONE MEDIAN, "RIVER ROCK" PATTERN WITH "COBBLESTONE GRAY" COLOR AND A LIQUID RELEASE AGENT SHALL BE USED.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
STAMPED CONCRETE MEDIAN	REVISIONS 07/19/16 BK 2016 — C–35



NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. THE TOP AND FACE OF THE CURB SHALL BE PAINTED WITH WHITE OR YELLOW WATERBORNE PAINT AND APPLY GLASS BEADS FOR RETROREFLECTIVITY IN ACCORDANCE TO CITY OF VISALIA STANDARD SPECIFICATIONS.
3. INSTALL TYPE G OR TYPE D RAISED PAVEMENT MARKERS PER CALTRANS STANDARD SPECIFICATIONS SECTION 81–3.02C. THE RAISED PAVEMENT MARKERS SHALL BE ATTACHED TO THE TOP OF THE CURB USING ADHESIVES PER CALTRANS STANDARD SPECIFICATIONS SECTIONS 81–3.02D AND 81–3.02E.

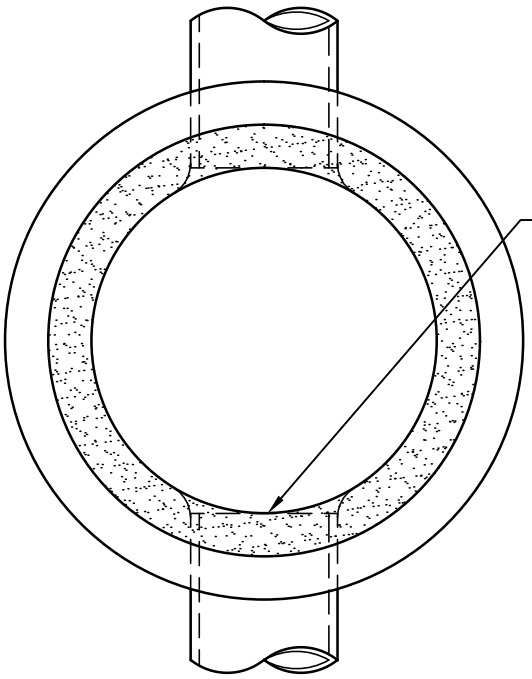
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

MEDIAN NOSE DETAIL

REVISIONS
09/08/16
BK 2016

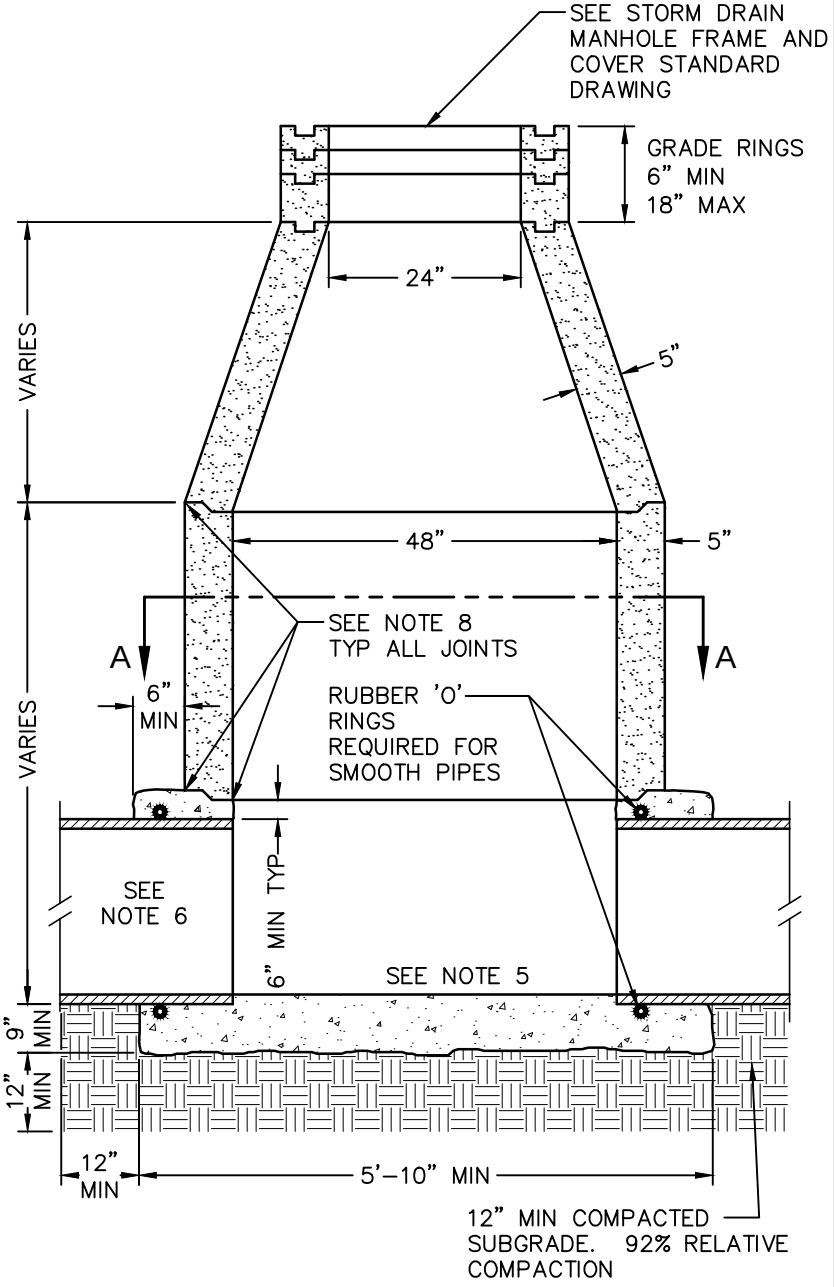
C–36



SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. SUMP BOTTOM MANHOLES ARE REQUIRED ON ALL STORM DRAIN SYSTEMS WITH PUMPS. 18" SUMP BELOW PIPE INVERT WHERE REQUIRED. SEE STORM DRAIN MANHOLE SUMP REQUIREMENTS STANDARD DRAWING.
6. 48" MANHOLES ARE REQUIRED FOR STORM DRAIN PIPE SIZES FROM 12" TO 24" OR AS REQUIRED BY THE CITY ENGINEER.
7. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02, AS IMPLEMENTED BY CITY OF VISALIA.
8. SEE STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS STANDARD DRAWING.



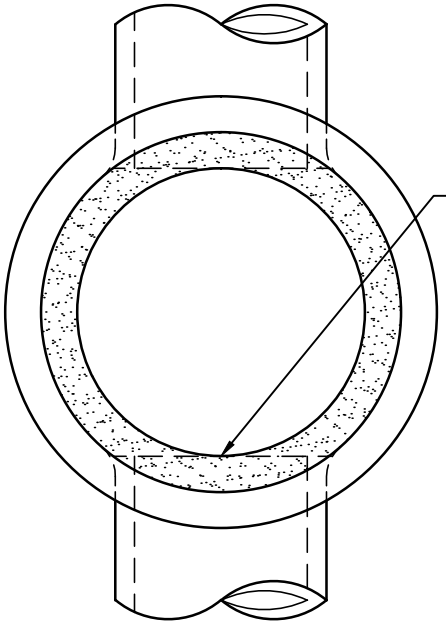
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

48" STORM DRAIN MANHOLE

REVISIONS
06/14/13
BK 2016

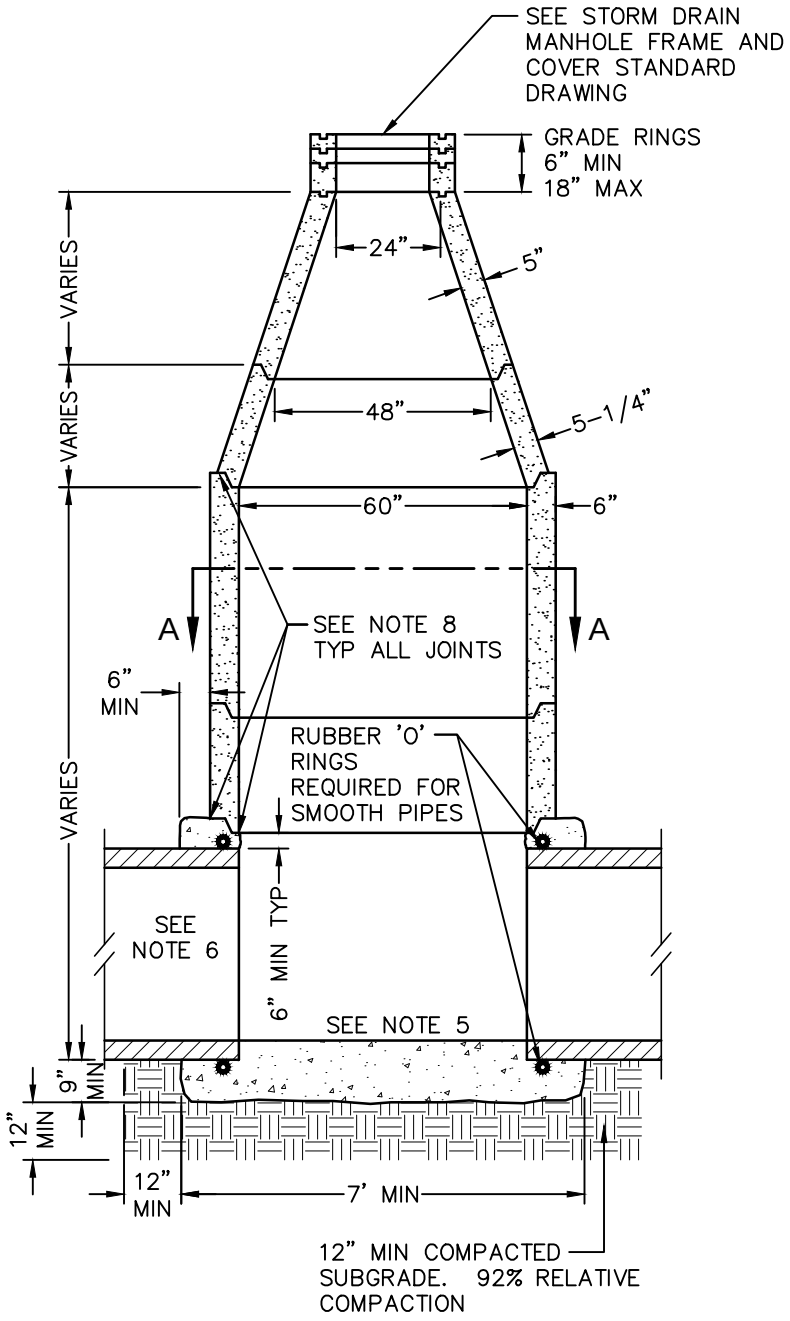
D-1



SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. SUMP BOTTOM MANHOLES ARE REQUIRED ON ALL STORM DRAIN SYSTEMS WITH PUMPS. 18" SUMP BELOW PIPE INVERT WHERE REQUIRED. SEE STORM DRAIN MANHOLE SUMP REQUIREMENTS STANDARD DRAWING.
6. 60" MANHOLES ARE REQUIRED FOR STORM DRAIN PIPE SIZES FROM 27" TO 36" OR AS REQUIRED BY THE CITY ENGINEER.
7. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02, AS IMPLEMENTED BY CITY OF VISALIA.
8. SEE STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS STANDARD DRAWING.



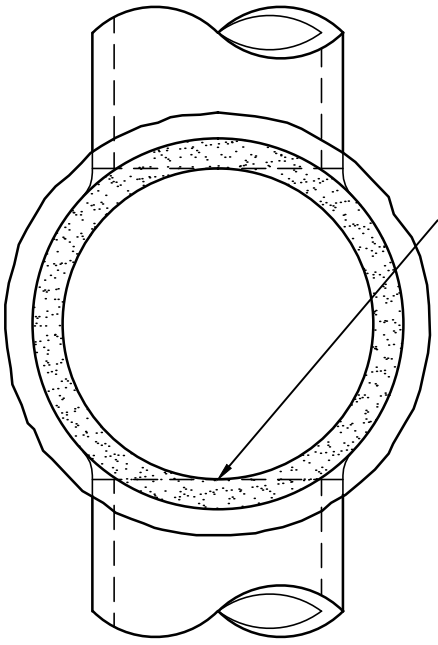
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

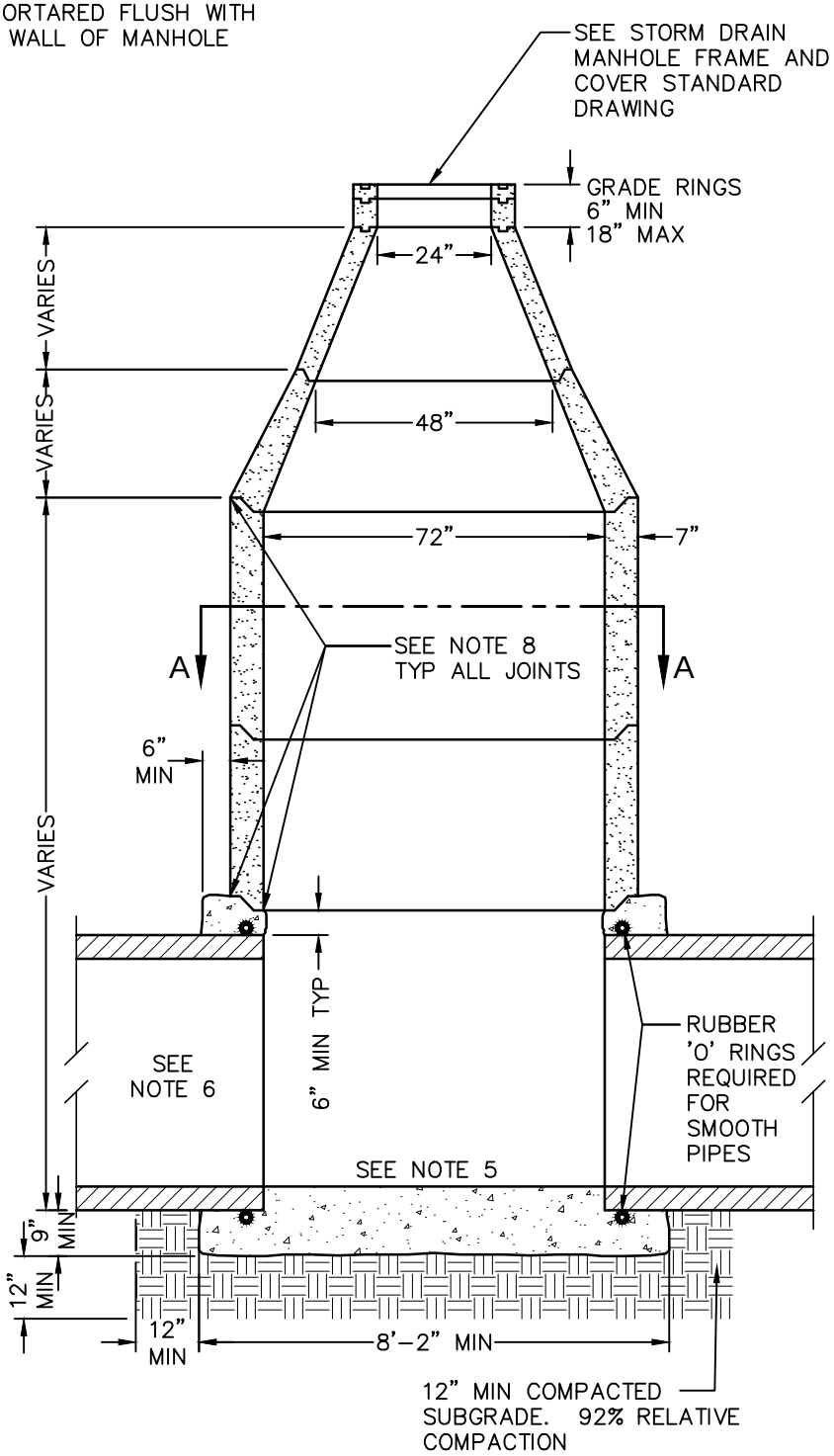
60" STORM DRAIN MANHOLE

REVISIONS
06/14/13
BK 2016

D-2



SECTION A-A



NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE–HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. SUMP BOTTOM MANHOLES ARE REQUIRED ON ALL STORM DRAIN SYSTEMS WITH PUMPS. 18" SUMP BELOW PIPE INVERT WHERE REQUIRED. SEE STORM DRAIN MANHOLE SUMP REQUIREMENTS STANDARD DRAWING.
6. 72" MANHOLES ARE REQUIRED FOR STORM DRAIN PIPE SIZES FROM 39" AND LARGER OR AS REQUIRED BY THE CITY ENGINEER.
7. EXFILTRATION TEST REQUIRED AS PER ASTM C969–02, AS IMPLEMENTED BY CITY OF VISALIA.
8. SEE STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS STANDARD DRAWING .

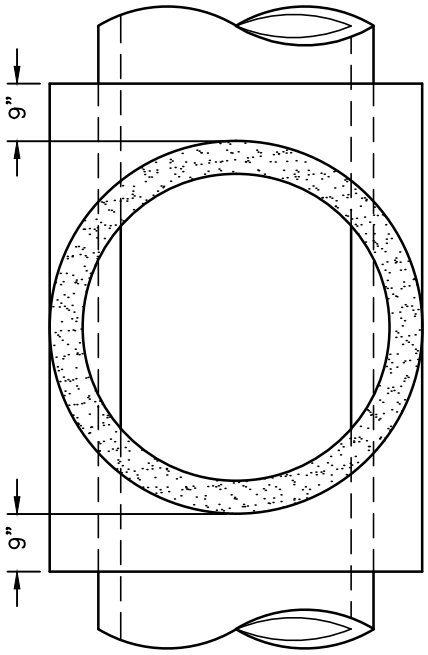
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

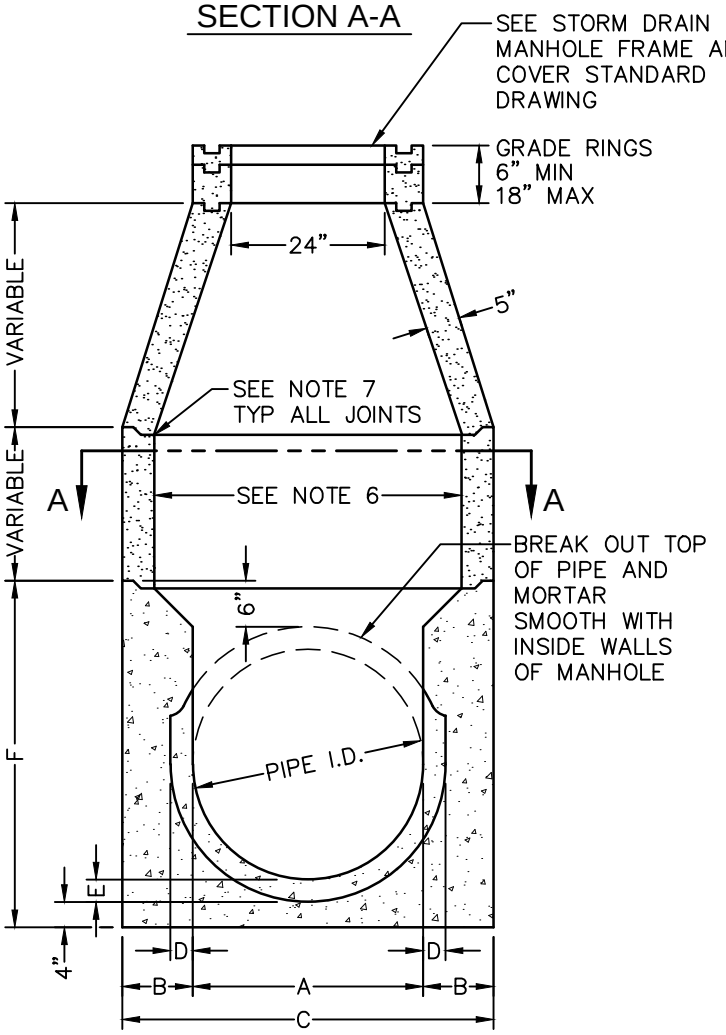
72" STORM DRAIN MANHOLE

REVISIONS
06/14/13
BK 2016

D–3



SECTION A-A



NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02, AS IMPLEMENTED BY CITY OF VISALIA.
6. MANHOLE SHALL BE SIZED TO MATCH MANHOLE BASE. 48" MINIMUM INNER DIAMETER MANHOLE IS REQUIRED.
7. SEE STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS STANDARD DRAWING.

PIPE I.D.	A	B	C	MIN D	E	F
24"	24"	17"	58"	3"	3"	40"
27"	27"	15-1/2"	58"	3"	3"	43"
30"	30"	14"	58"	3"	3"	46"
36"	36"	17"	70"	3-1/2"	3-1/2"	53"
42"	42"	15"	72"	4"	4"	60"
48"	48"	12"	72"	5"	5"	68"
54"	54"	10-1/2"	75"	5-1/2"	5-1/2"	75"
60"	60"	11"	82"	6"	6"	82"
66"	66"	11-1/2"	89"	6-1/2"	6-1/2"	89"
72"	72"	12"	96"	7"	7"	96"

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

CAST IN PLACE CONCRETE PIPE MANHOLE

REVISIONS
06/14/13
BK 2016

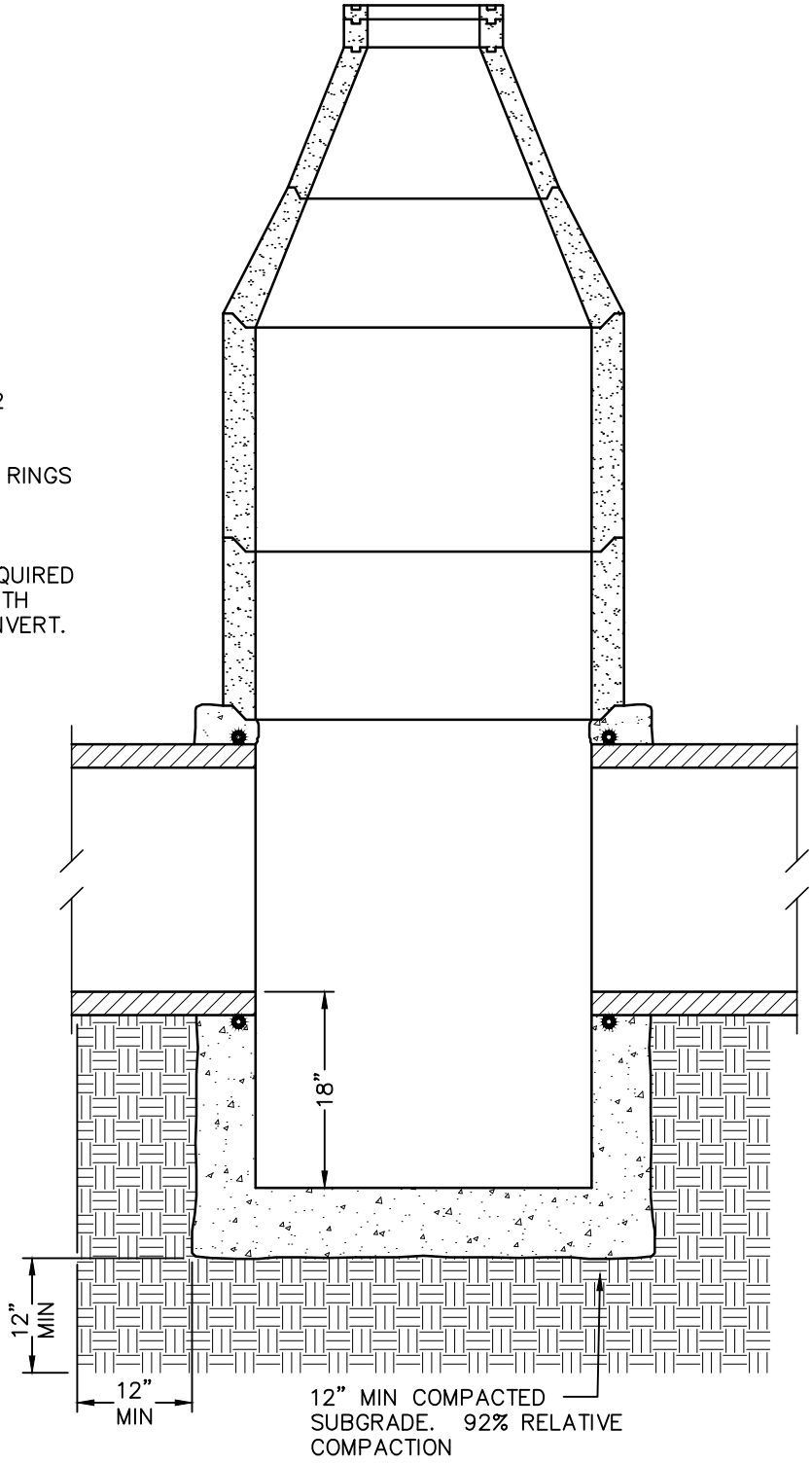
D-4

RESERVED FOR FUTURE DETAIL

APPROVED BY:_____ _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS BK 2016
	D-5

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. SUMP BOTTOM MANHOLES ARE REQUIRED ON ALL STORM DRAIN SYSTEMS WITH PUMPS. 18" SUMP BELOW PIPE INVERT.



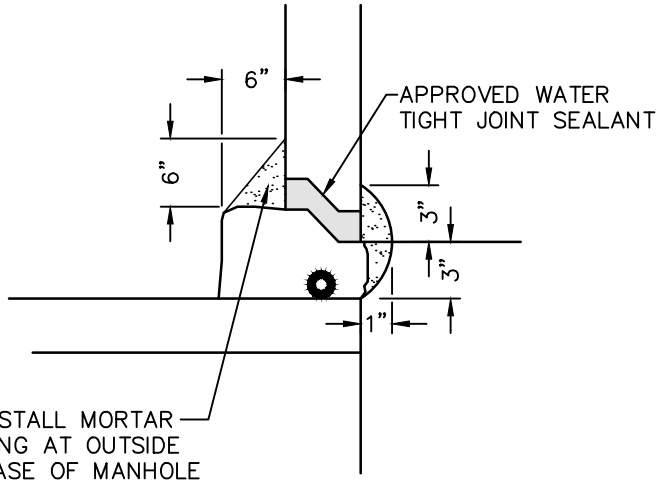
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

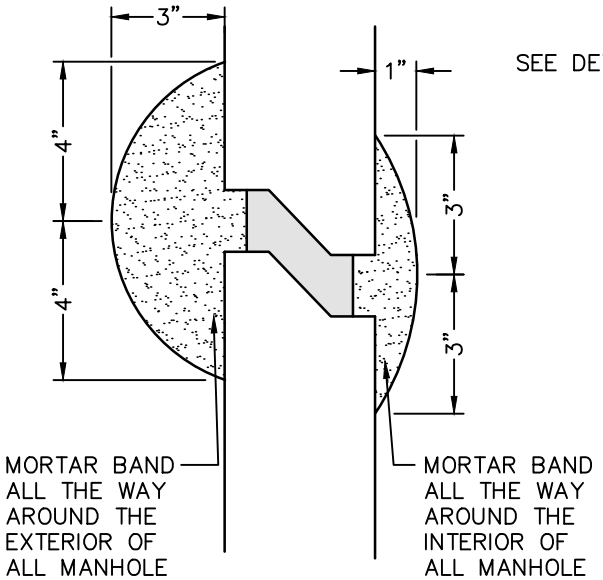
STORM DRAIN MANHOLE SUMP REQUIREMENTS

REVISIONS
06/14/13
BK 2016

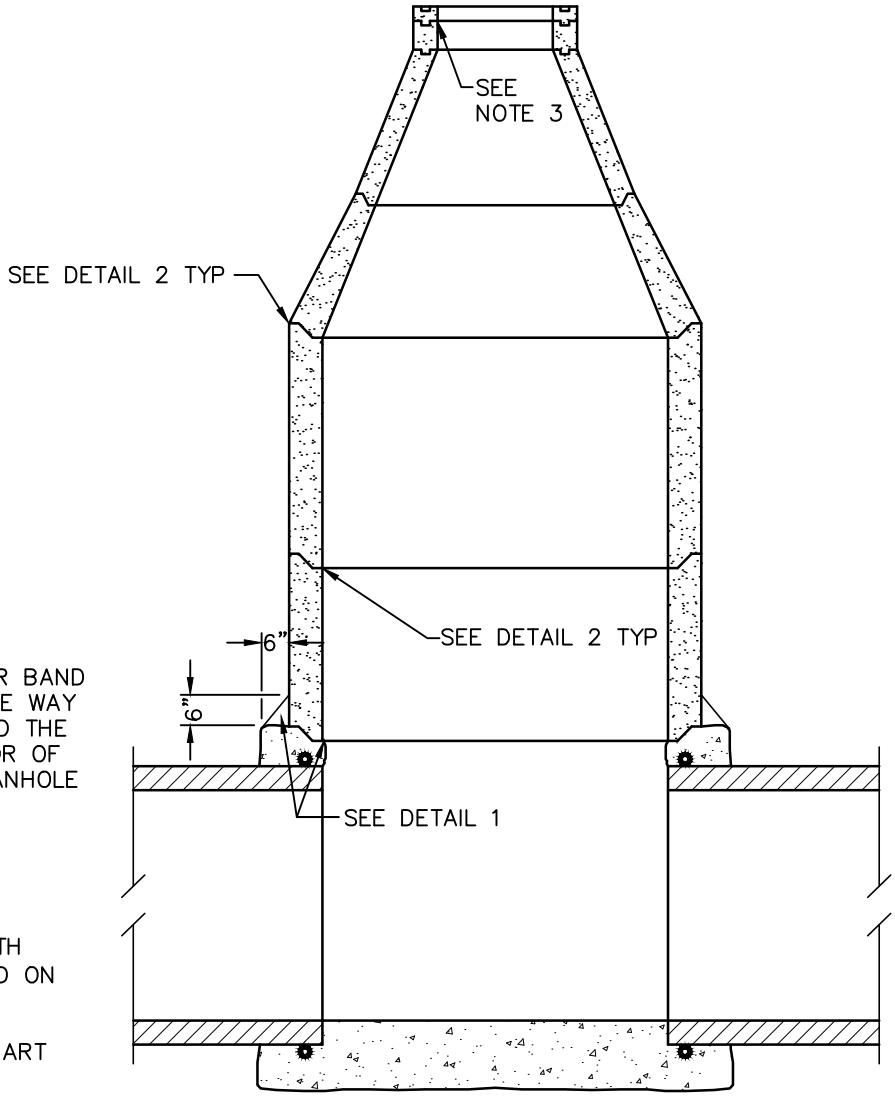
D–6



DETAIL 1



DETAIL 2



NOTES:

1. ALL JOINTS SHALL BE FINISHED WITH MORTAR AS SHOWN AND/OR NOTED ON THIS DETAIL.
2. MORTAR MIXTURE SHALL BE ONE PART CEMENT PER TWO PARTS SAND.
3. MORTAR INSIDE OF GRADE RINGS TO A SMOOTH SURFACE.
4. ALL JOINTS SHALL BE WATER TIGHT.

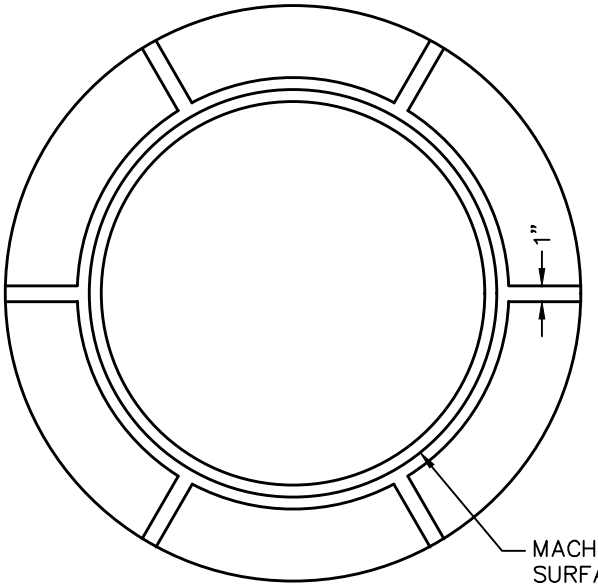
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

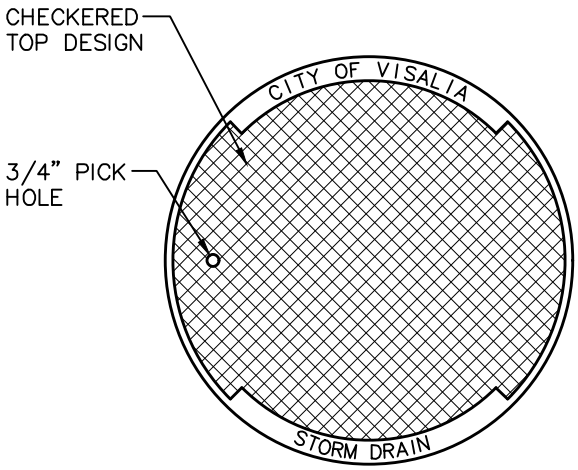
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

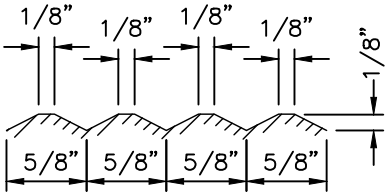
STORM DRAIN MANHOLE JOINT FINISHING REQUIREMENTS

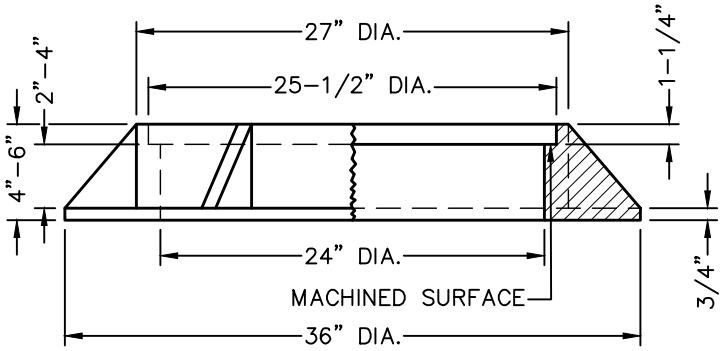
REVISIONS
06/14/13
BK 2016

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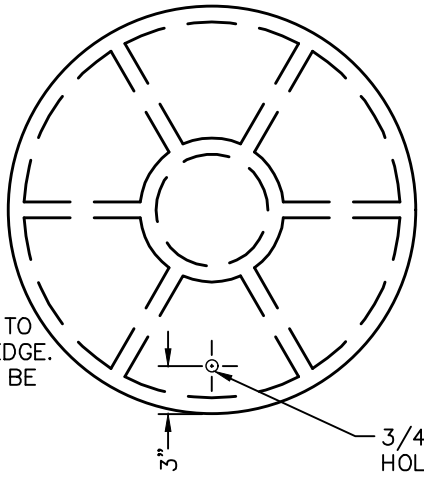


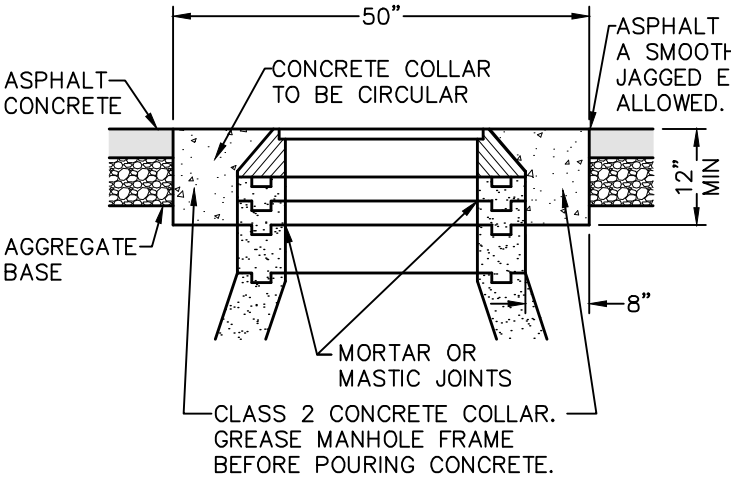




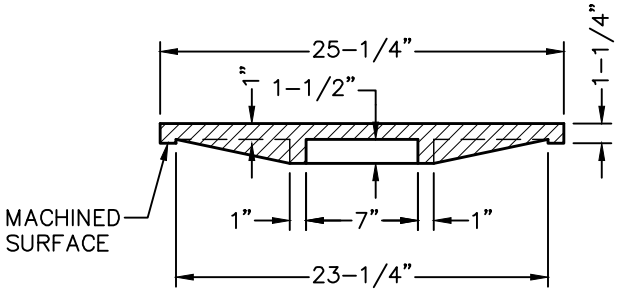


MANHOLE FRAME





MANHOLE ADJUSTMENT



MANHOLE COVER

NOTE: FRAME, COVER AND CONCRETE COLLAR SHALL MATCH CROSS SLOPE.
CURE CONCRETE A MINIMUM OF 48 HOURS PRIOR TO TRAFFIC USE.

APPROVED BY: _____ 02/05/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

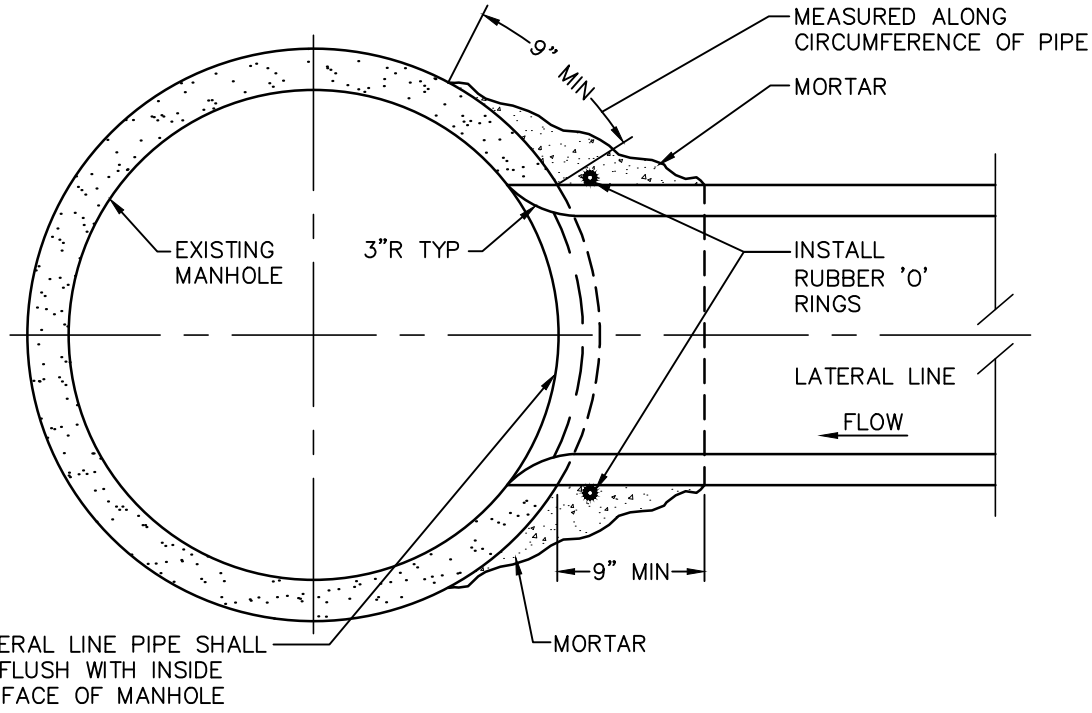
STORM DRAIN MANHOLE FRAME AND COVER

REVISIONS
02/05/25
BK 2016

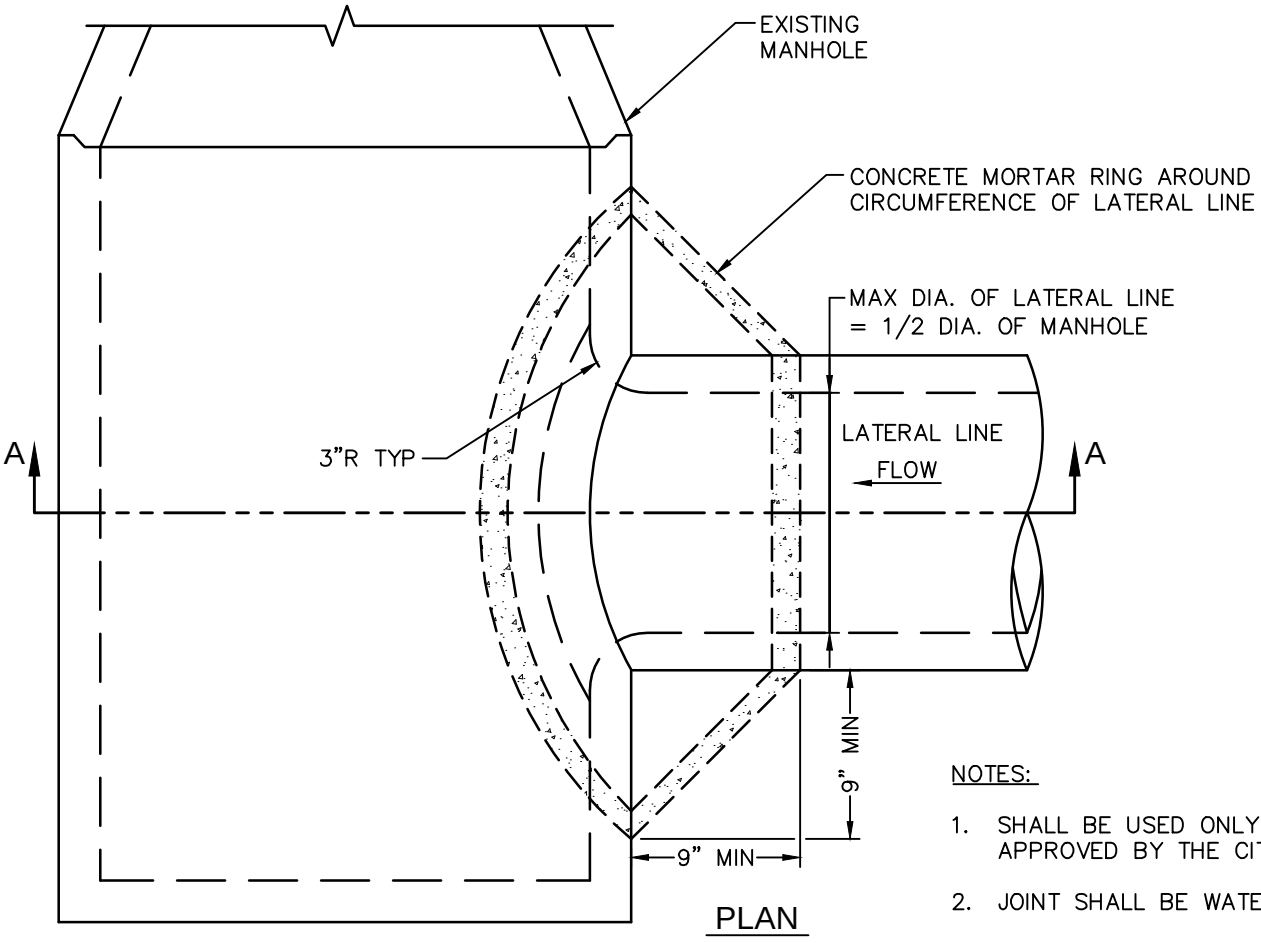
D-8

RESERVED FOR FUTURE DETAIL

APPROVED BY: _____ _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS BK 2016
	D–9



SECTION A-A



PLAN

NOTES:

1. SHALL BE USED ONLY AS APPROVED BY THE CITY ENGINEER.
2. JOINT SHALL BE WATER TIGHT.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

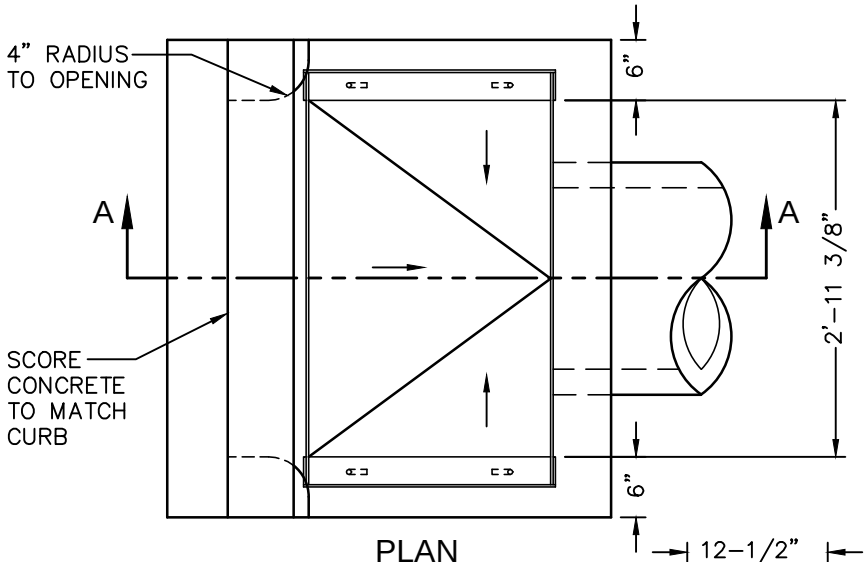
LATERAL LINE CONNECTION AT EXISTING MANHOLE

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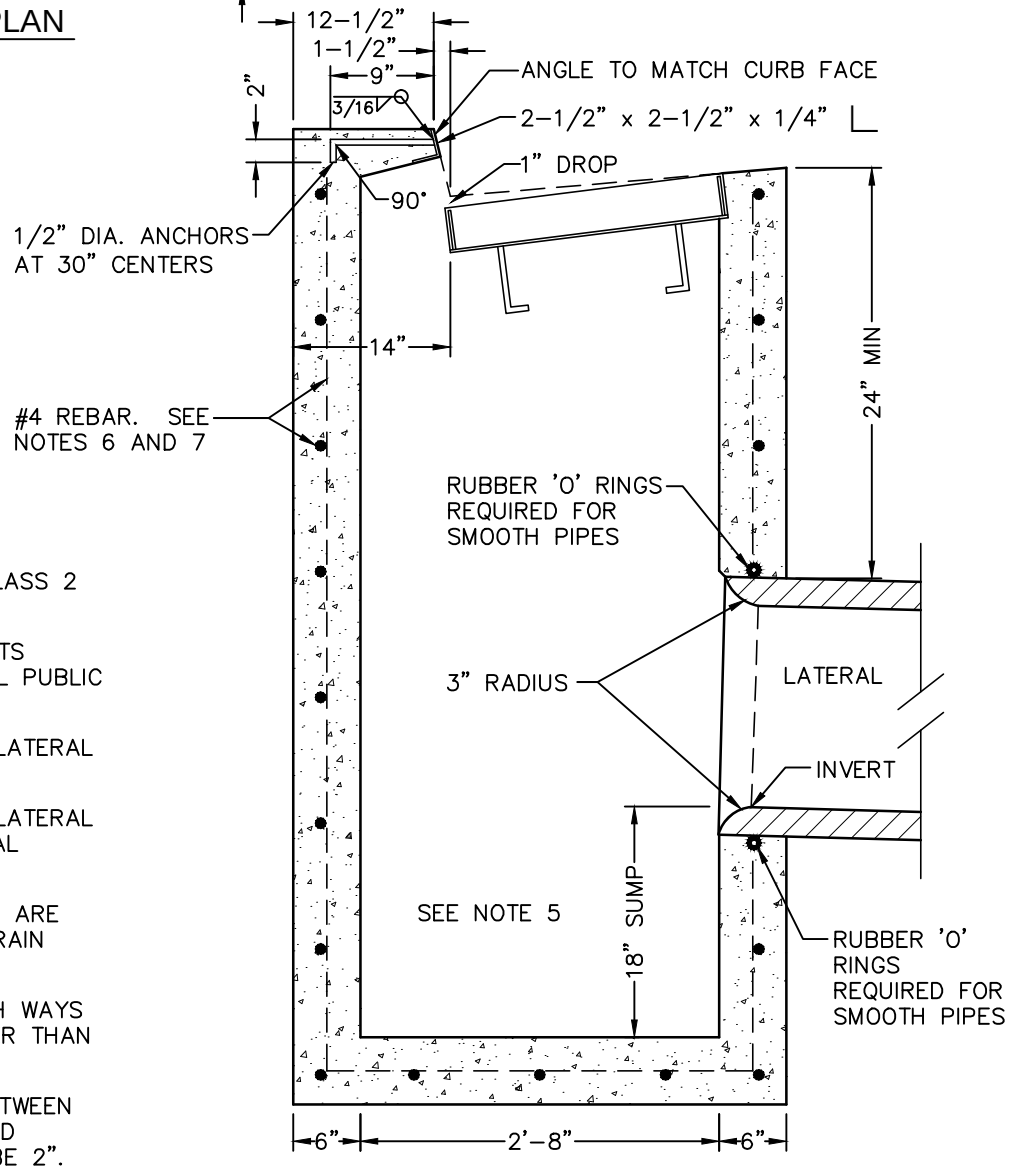
D–10

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RESERVED	REVISIONS BK 2016
	D–11



PLAN



SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MAJOR TYPE DRAINAGE INLETS SHALL BE INSTALLED ON ALL PUBLIC STREETS.
3. 12" MINIMUM STORM DRAIN LATERAL ON LOCAL STREETS.
4. 18" MINIMUM STORM DRAIN LATERAL ON COLLECTOR AND ARTERIAL STREETS.
5. SUMP BOTTOM DRAIN INLETS ARE REQUIRED ON ALL STORM DRAIN SYSTEMS.
6. #4 REBAR AT 18" O.C. BOTH WAYS WHEN DRAIN INLET IS DEEPER THAN 6' BELOW TOP OF CURB.
7. MINIMUM CLEAR SPACING BETWEEN SURFACES OF CONCRETE AND REINFORCING STEEL SHALL BE 2".

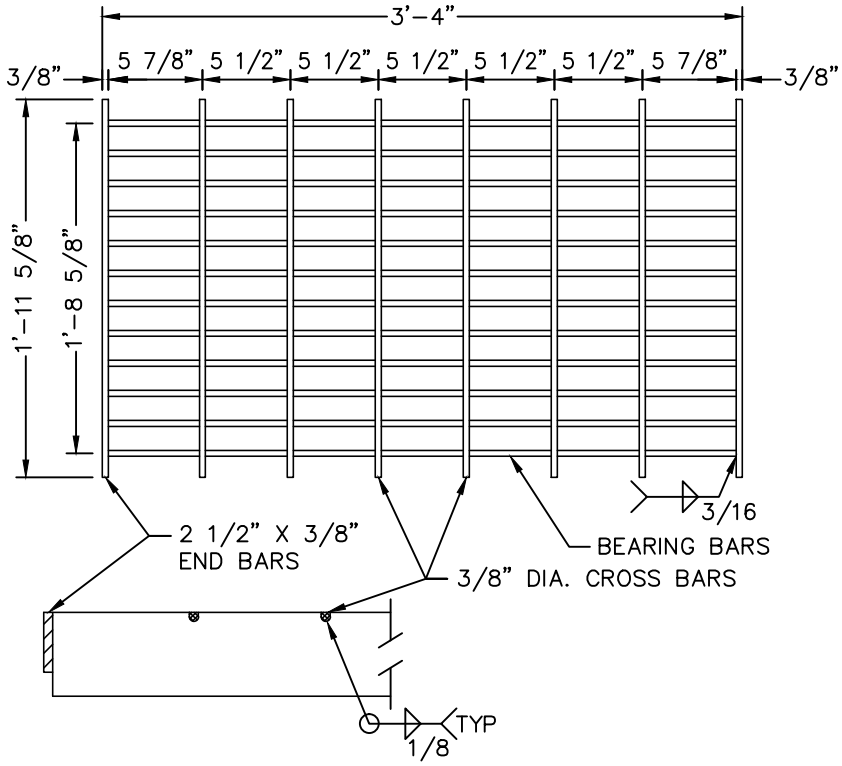
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

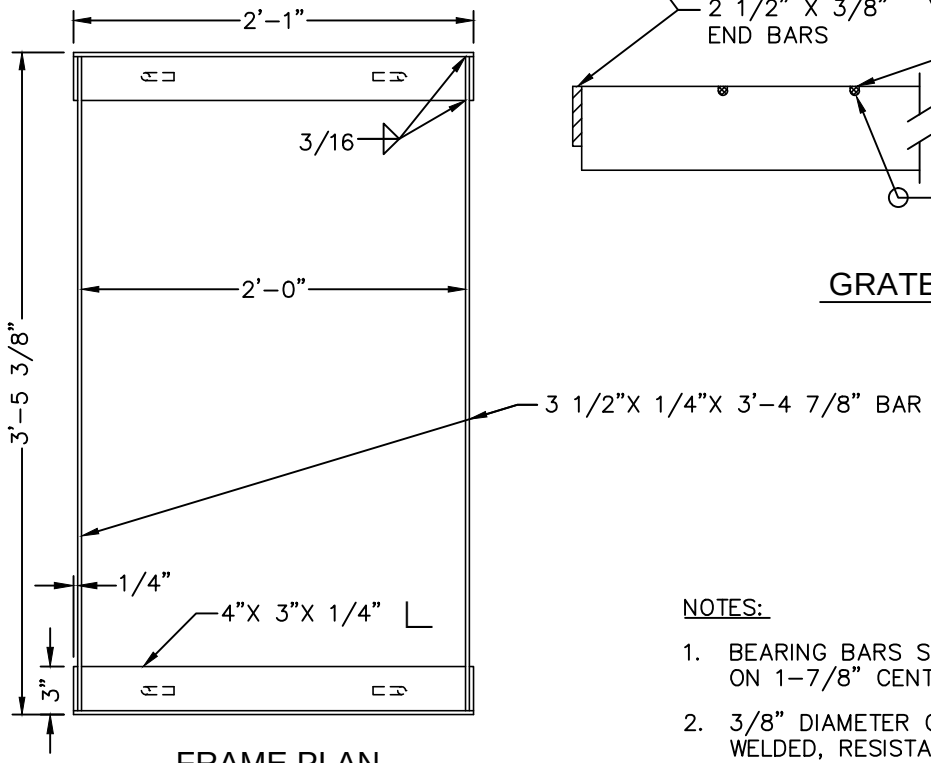
DRAINAGE INLET – GO TYPE

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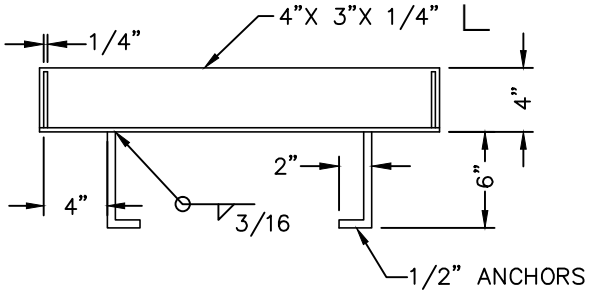
GRATE DETAIL



FRAME PLAN

NOTES:

1. BEARING BARS SHALL BE 3-1/2"X 3/8" BARS ON 1-7/8" CENTERS.
2. 3/8" DIAMETER CROSS BARS MAY BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.
3. FRAME AND GRATE SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.



FRAME SECTION

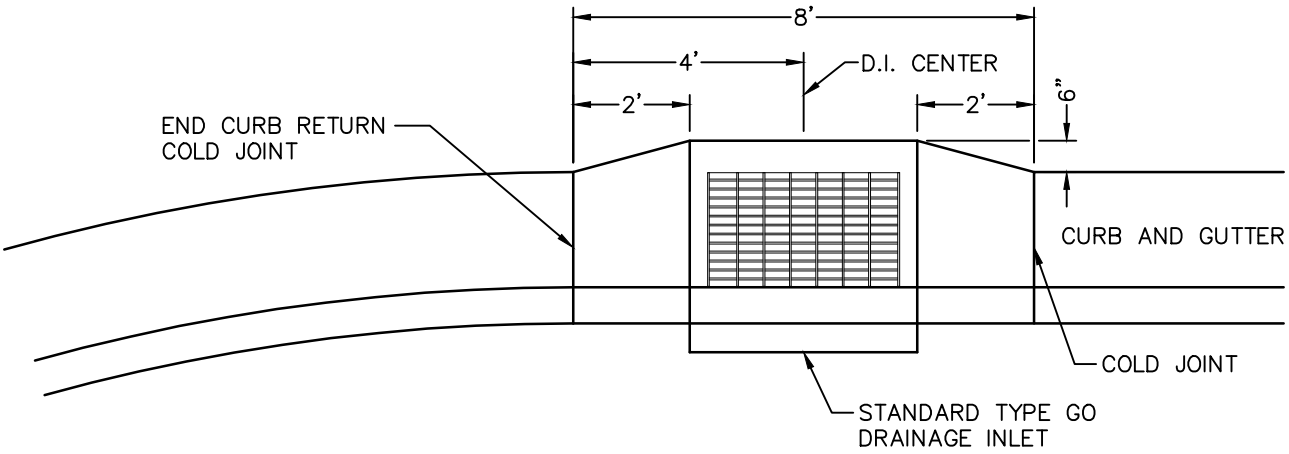
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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

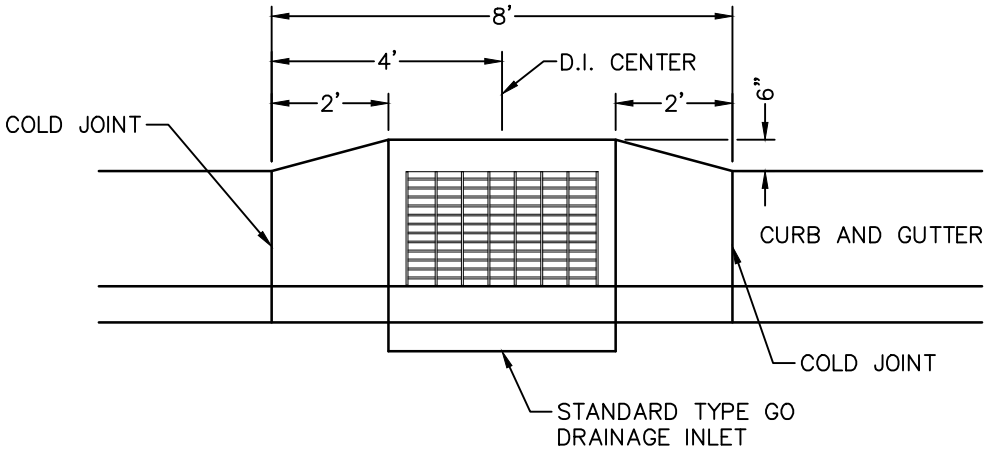
DRAINAGE INLET – GO TYPE FRAME AND GRATE DETAIL

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TYPE GO DRAINAGE INLET (D.I.)
INSTALLED AT CURB RETURN



TYPE GO DRAINAGE INLET (D.I.)
INSTALLED MID-BLOCK

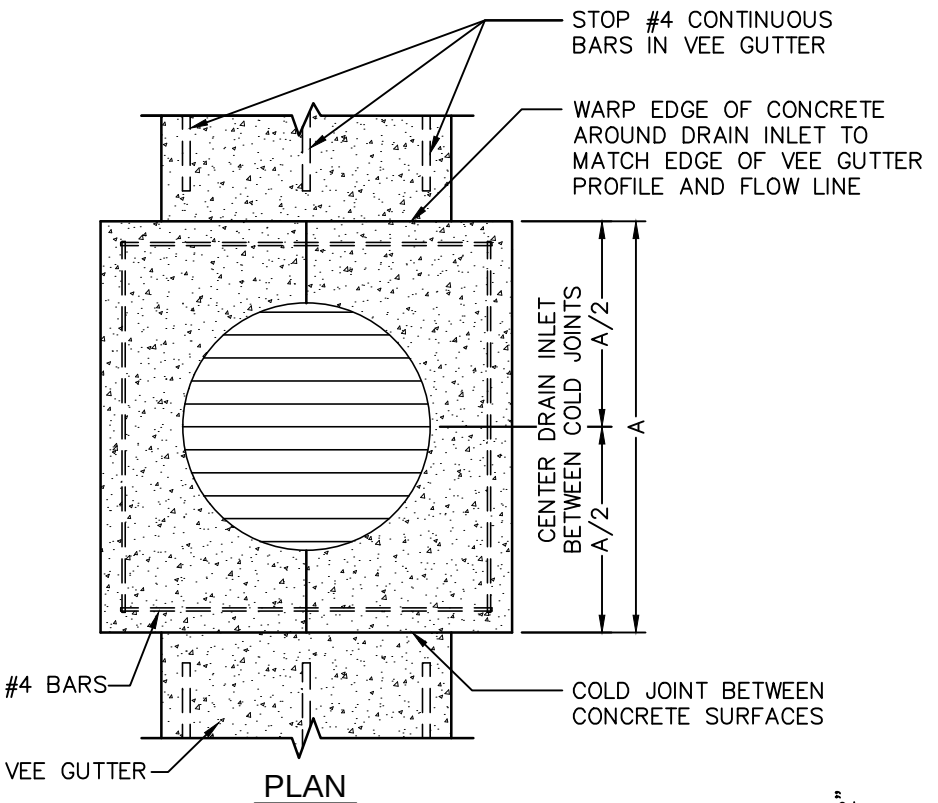
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

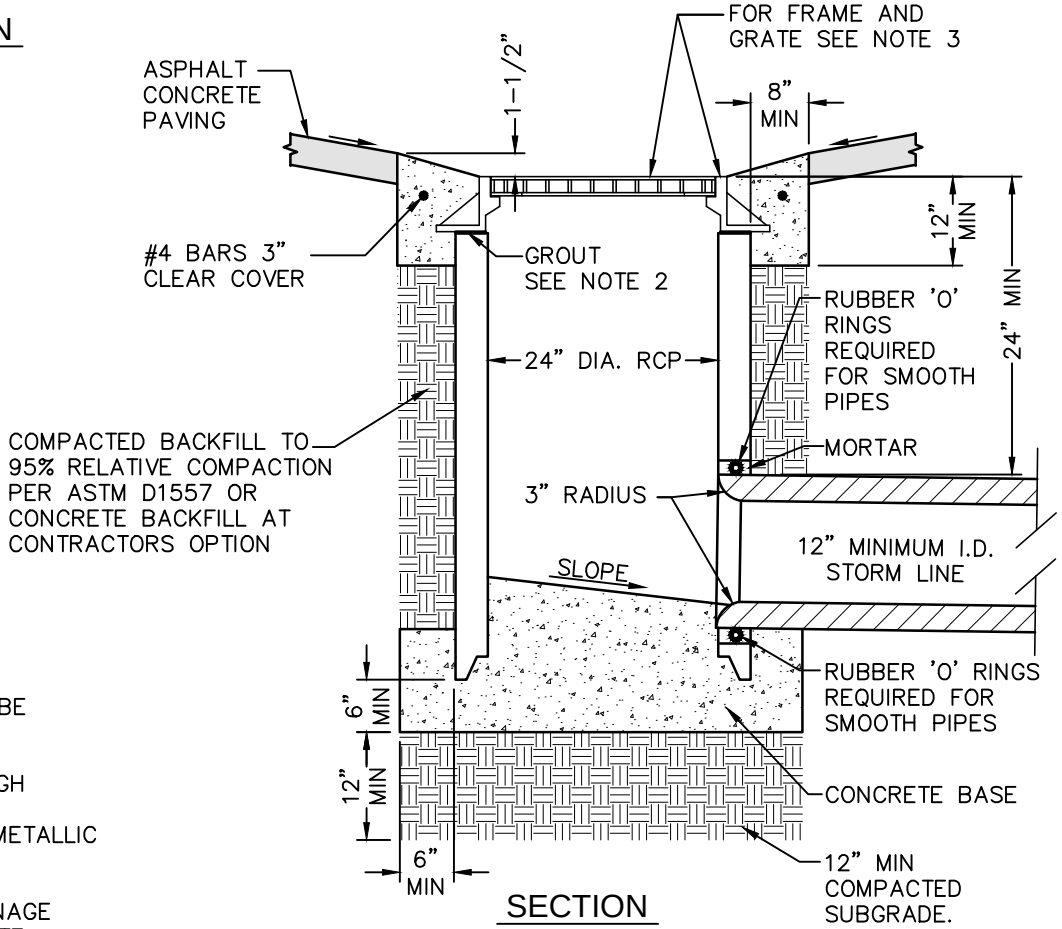
MISCELLANEOUS DRAINAGE INLET DETAILS

REVISIONS
08/26/16
BK 2016

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PLAN



SECTION

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. GROUT SHALL BE A HIGH STRENGTH, SHRINKAGE COMPENSATING, NON-METALLIC GROUT, OR EQUAL.
3. SEE VEE GUTTER DRAINAGE INLET FRAME AND GRATE STANDARD DRAWING.

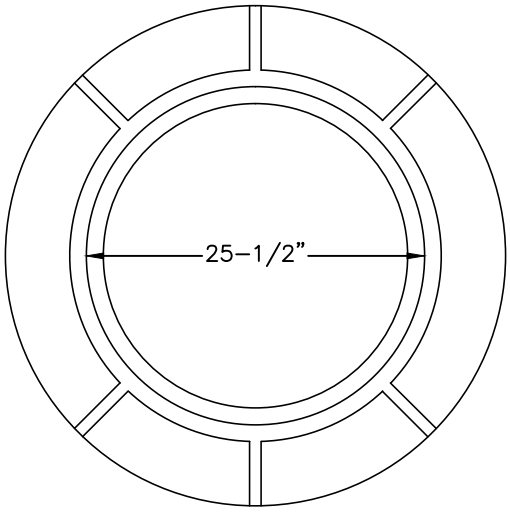
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

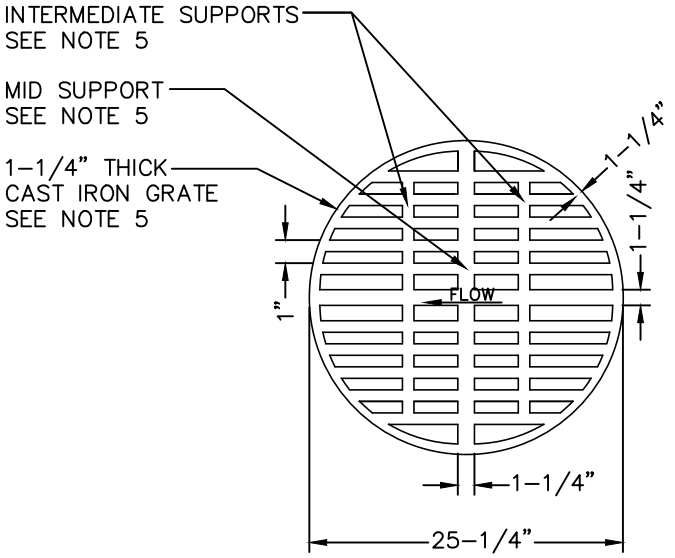
VEE GUTTER DRAINAGE INLET

REVISIONS
06/14/13
BK 2016

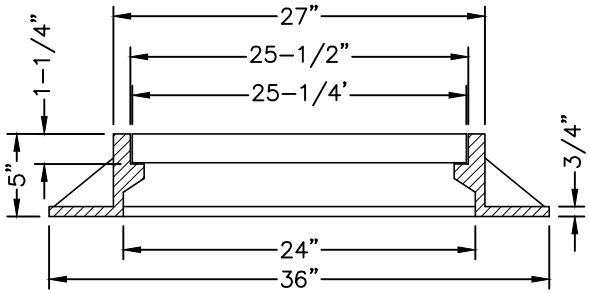
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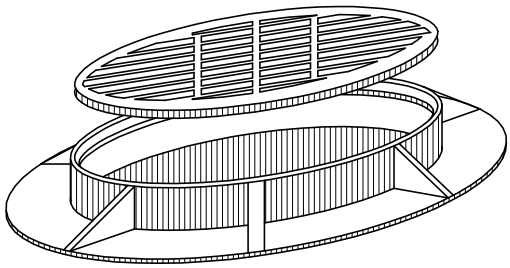
FRAME
PLAN



GRATE
PLAN



FRAME
SECTION



PERSPECTIVE

NOTES:

1. ALL DIMENSIONS ARE FINISHED DIMENSIONS. FRAME AND COVER BEARING SURFACE TO BE MACHINED TO ASSURE CLOSE, QUIET FIT.
2. CONSTRUCTION MATERIAL SHALL BE CAST IRON, DIPPED IN BLACK BITUMINOUS PAINT.
3. FRAME AND GRATE TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM DESIGNATION 48, CLASS 35B, AND EXCEED H20 WHEEL LOADING.
4. GRATE TO BE INSTALLED SUCH THAT THE SLOTS ARE PARALLEL WITH THE DIRECTION OF WATER FLOW.
5. GRATES WITH MID AND INTERMEDIATE SUPPORTS SHALL BE USED AT ALL LOCATIONS WHERE BICYCLE OR OTHER WHEELED TRANSPORT SUCH AS WHEEL CHAIRS CAN BE ANTICIPATED. COVERS WITHOUT INTERMEDIATE SUPPORTS SHALL NOT BE USED WITHOUT APPROVAL OF THE CITY ENGINEER.
6. ALL GRATES SHALL HAVE A MINIMUM OPEN AREA OF 1.0 SQUARE FEET AND A MINIMUM WEIR PERIMETER OF 6.0 LINEAR FEET. ENGINEER OF RECORD SHALL BE RESPONSIBLE FOR VERIFYING GRATES MEET DRAINAGE REQUIREMENTS.
7. IF GRATE IS LOCATED IN A DESIGNATED ACCESSIBLE PATH OF TRAVEL, GRATE SHALL BE A.D.A. COMPLIANT.

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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

VEE GUTTER INLET FRAME & GRATE

REVISIONS
06/14/13
BK 2016

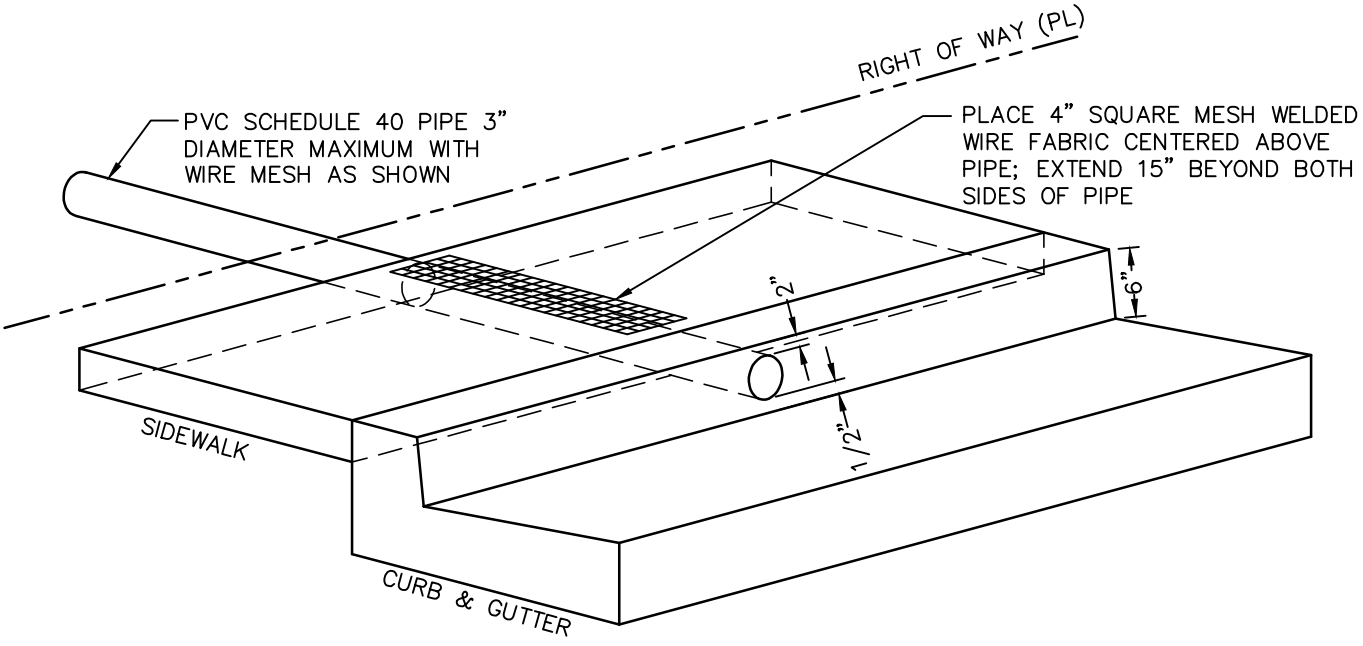
D–16

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RESERVED	REVISIONS BK 2016
	D–17

RESERVED FOR FUTURE DETAIL

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RESERVED	REVISIONS BK 2016
	D–18



PERSPECTIVE

NOTES:

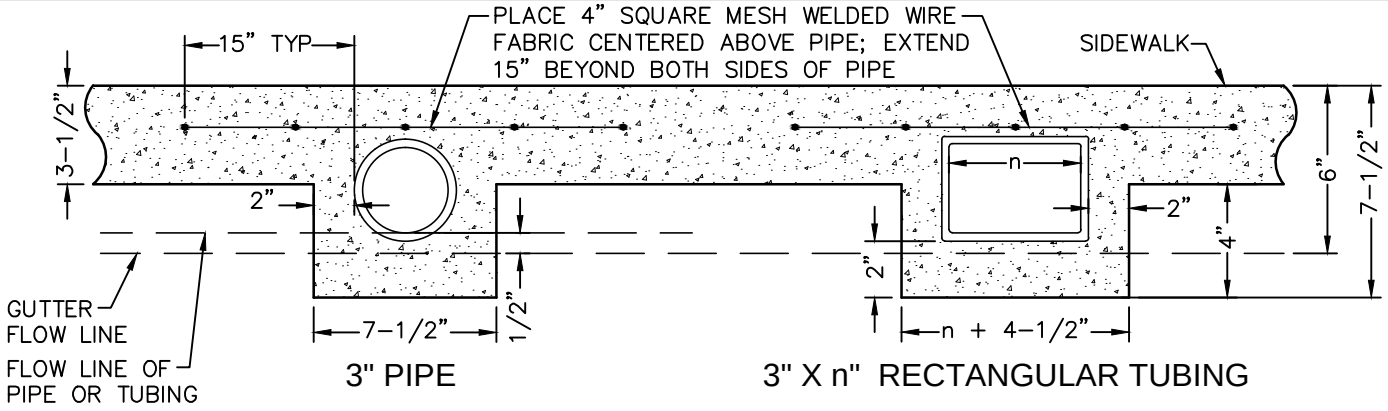
1. WHERE SIDEWALK AND CURB AND GUTTER EXIST, SIDEWALK AND CURB AND GUTTER SHALL BE REMOVED AND REPLACED TO THE NEAREST JOINT AND SHALL BE CONSTRUCTED PER APPLICABLE CITY OF VISALIA STANDARD DRAWINGS.

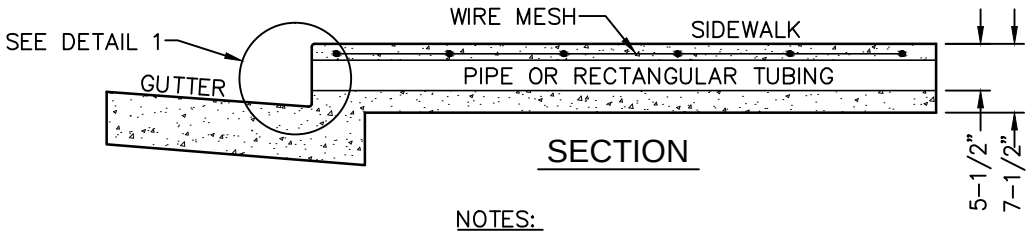
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AN ENCROACHMENT PERMIT FOR ANY WORK WITHIN THE CITY RIGHT OF WAY, INCLUDING THE REMOVAL AND REPLACEMENT OF THE SIDEWALK AND CURB AND GUTTER AND THE CONSTRUCTION OF THE RESIDENTIAL UNDER SIDEWALK DRAIN, FROM THE CITY OF VISALIA ENGINEERING DIVISION.

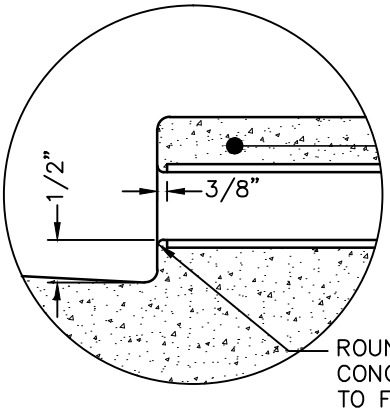
3. THE ENGINEER OF RECORD SHALL DETERMINE THE NUMBER OF DRAINS REQUIRED.

4. WELDED WIRE MESH SHALL BE 4X4–W2.1XW2.1.

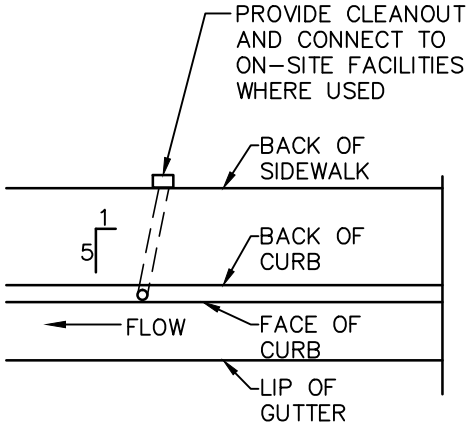
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS	
RESIDENTIAL SIDEWALK DRAIN	REVISIONS 06/14/13 BK 2016	D–19







DETAIL 1
SEE NOTE 6



DETAIL 2
SEE NOTE 5

NOTES:

1. 3" PIPE SHALL BE GALVANIZED PIPE. RECTANGULAR TUBING SHALL BE STEEL.
2. MINIMUM WALL THICKNESS OF RECTANGULAR TUBING IS 3/16".
3. SLOPE SHALL MATCH CROSS GRADE OF SIDEWALK.
4. NO DRAIN SHALL BE PERMITTED IN DRIVE APPROACH AREAS.
5. DRAINS SHALL BE ANGLED THROUGH SIDEWALK IN DIRECTION OF GUTTER FLOW. SEE DETAIL 2.
6. PIPE OR TUBING SHALL BE CUT SQUARE AND ROUNDED WITH FACE OF CURB. SEE DETAIL 1.
7. PERMITTED SIZE AND NUMBER OF PIPES/TUBING TO BE BASED ON DRAINAGE AREA AND SHALL BE DETERMINED BY THE ENGINEER OF RECORD.
8. AREA 3" DIA. PIPE = 7.1 SQ. IN.
   AREA 3" X 5" RECT. TUBE = 12.3 SQ. IN. (3/16" THICK)
   AREA 3" X 6" RECT. TUBE = 14.9 SQ. IN. (3/16" THICK)
   AREA 3" X 12" CHANNEL = 36 SQ. IN.
   AREA 4" X 14" CHANNEL = 56 SQ. IN.
9. WHERE SIDEWALK AND CURB AND GUTTER EXIST, SIDEWALK AND CURB AND GUTTER SHALL BE REMOVED AND REPLACED TO THE NEAREST JOINT AND SHALL BE CONSTRUCTED PER APPLICABLE CITY OF VISALIA STANDARD DRAWINGS.
10. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AN ENCROACHMENT PERMIT FOR ANY WORK WITHIN THE CITY RIGHT OF WAY, INCLUDING THE REMOVAL AND REPLACEMENT OF THE SIDEWALK AND CURB AND GUTTER AND THE CONSTRUCTION OF THE RESIDENTIAL UNDER SIDEWALK DRAIN, FROM THE CITY OF VISALIA ENGINEERING DIVISION.
11. THE ENGINEER OF RECORD SHALL DETERMINE THE NUMBER OF DRAINS REQUIRED.
12. WELDED WIRE MESH SHALL BE 4X4-W2.1XW2.1.

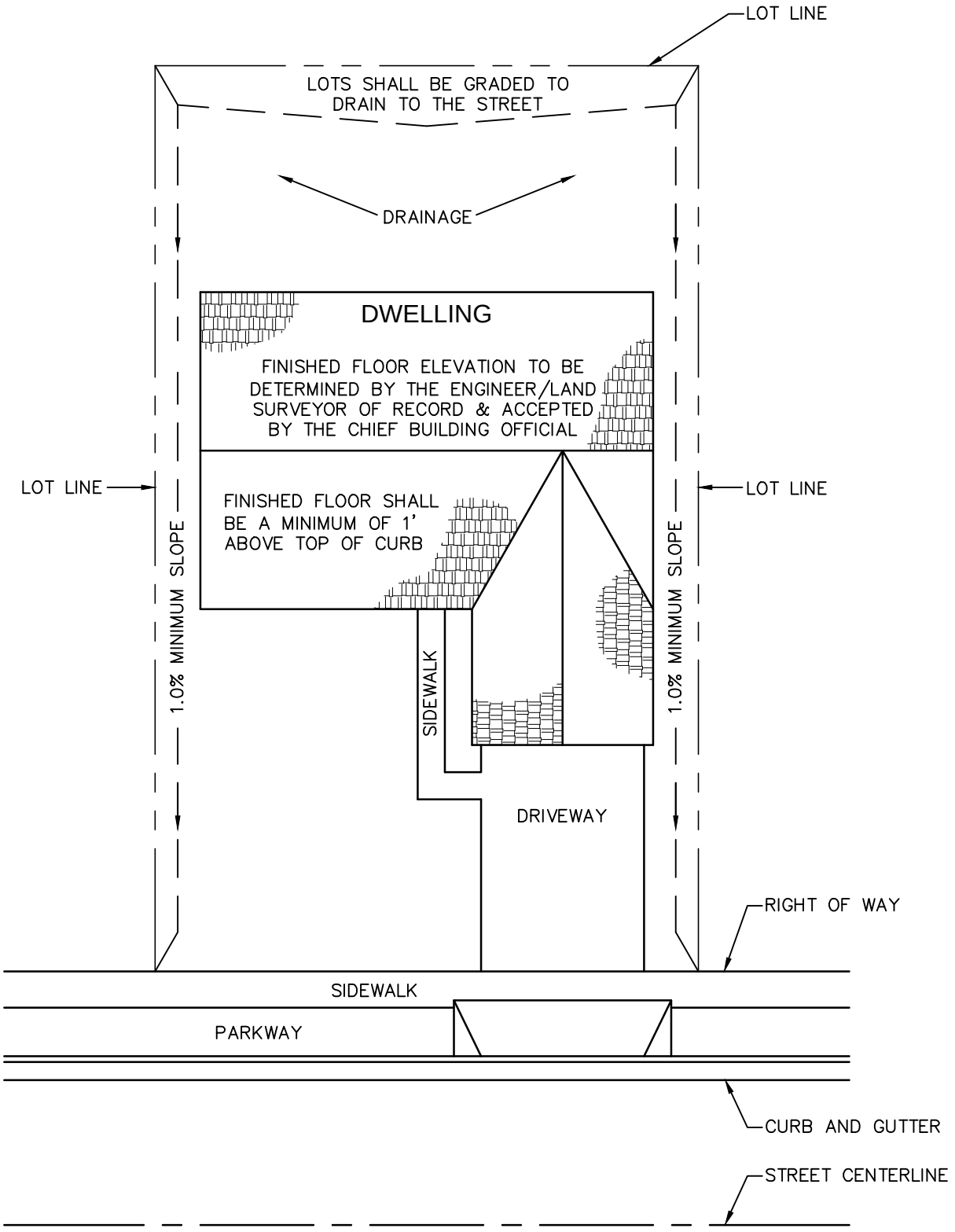
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

COMMERCIAL SIDEWALK DRAIN

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06/14/13
BK 2016

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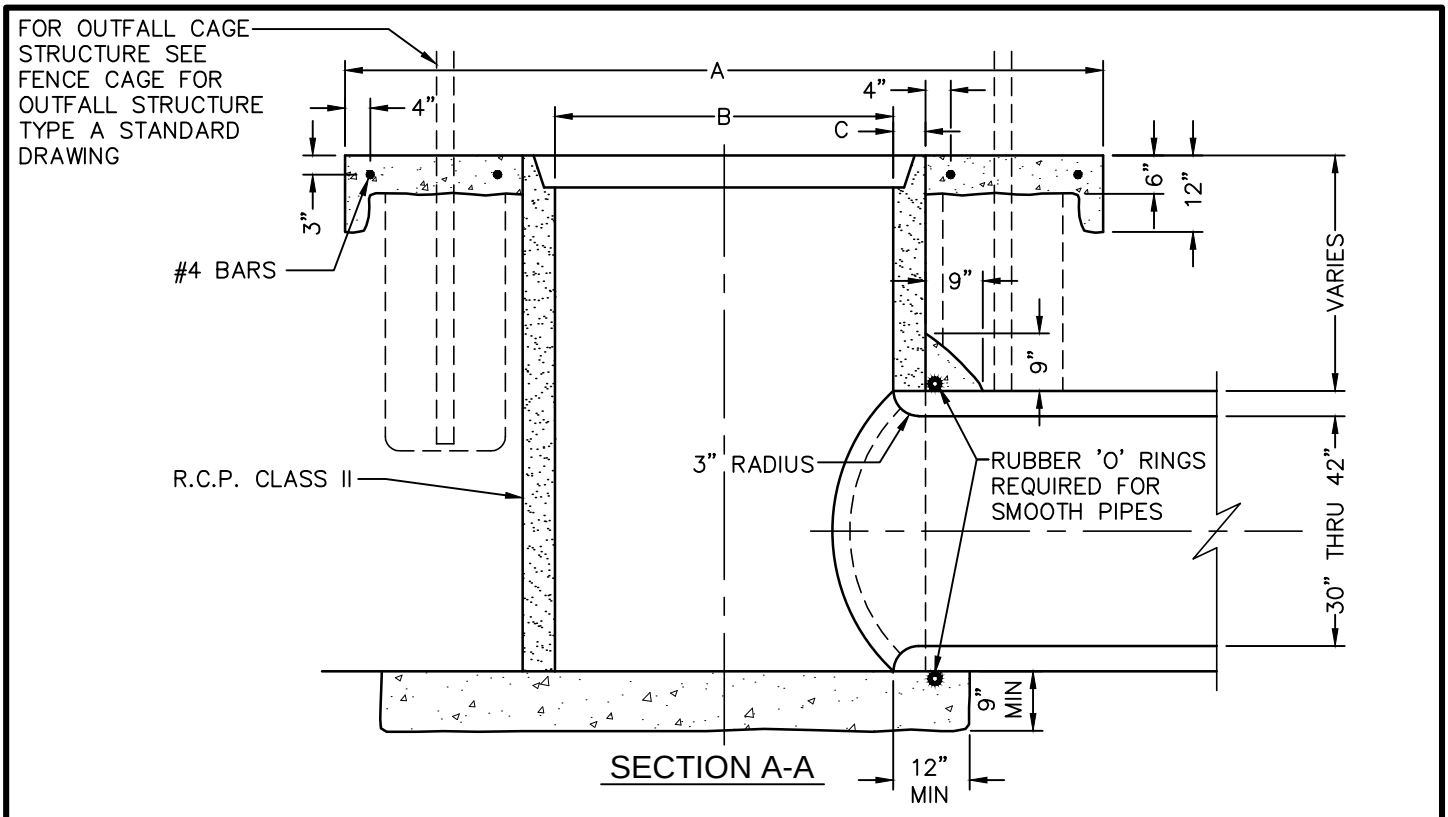
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

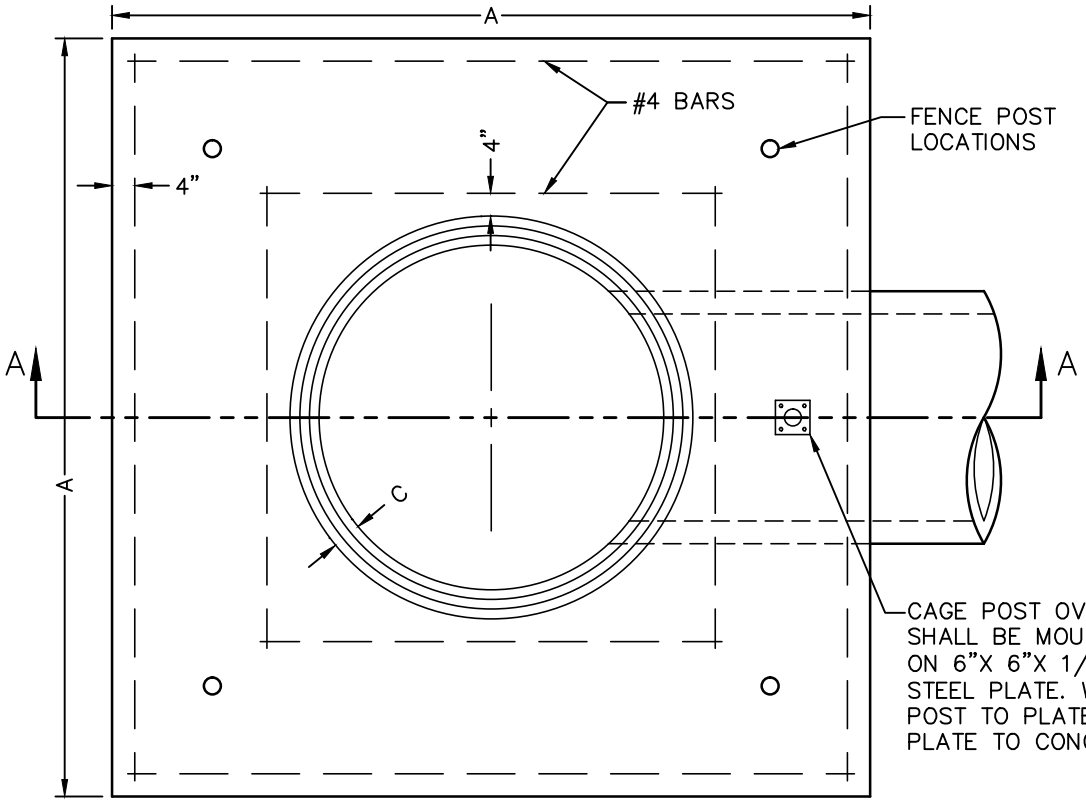
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TYPICAL LOT DRAINAGE

REVISIONS
06/14/13
BK 2016

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PLAN

NOTES:

1. FOR DIMENSIONS SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE A STANDARD DRAWING.

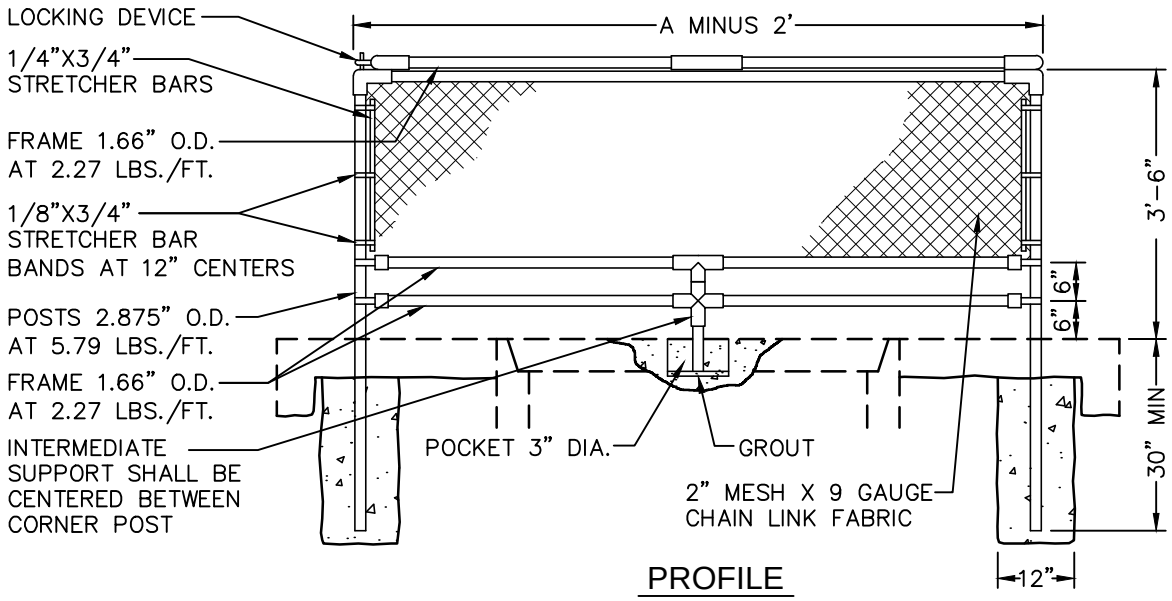
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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

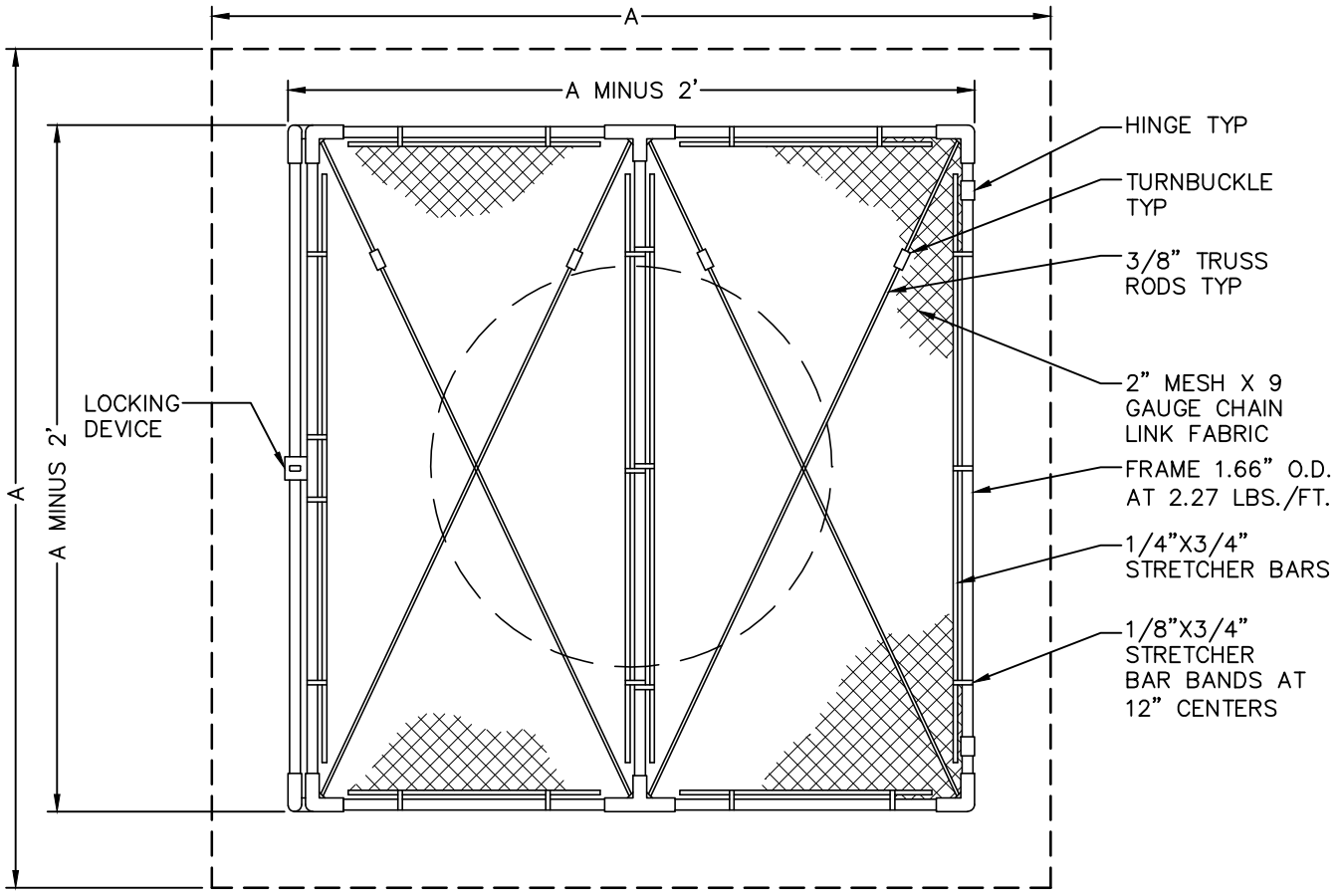
OUTFALL STRUCTURE TYPE A

REVISIONS
11/15/07
BK 2016

D–22



PROFILE



PLAN

NOTES:

1. LOCKING DEVICE SHALL BE APPROVED BY THE CITY ENGINEER.
2. FOR DIMENSIONS SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE A STANDARD DRAWING.

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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

FENCE CAGE FOR OUTFALL STRUCTURE TYPE A

REVISIONS
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BK 2016

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TYPE	MAX PIPE SIZE	DESIGN (C.F.S.)	A	B	C
A	30"	12–16	8'–0"	42"	3 1/2"
A	36"	16–21	9'–0"	48"	4"
A	42"	21–29	10'–0"	54"	4 1/2"

DESIGN TABLE
TYPE A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. REINFORCING BARS SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REINFORCING BARS SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
3. REINFORCING BARS SHALL HAVE A MINIMUM OF 2" OF CLEAR COVERAGE.

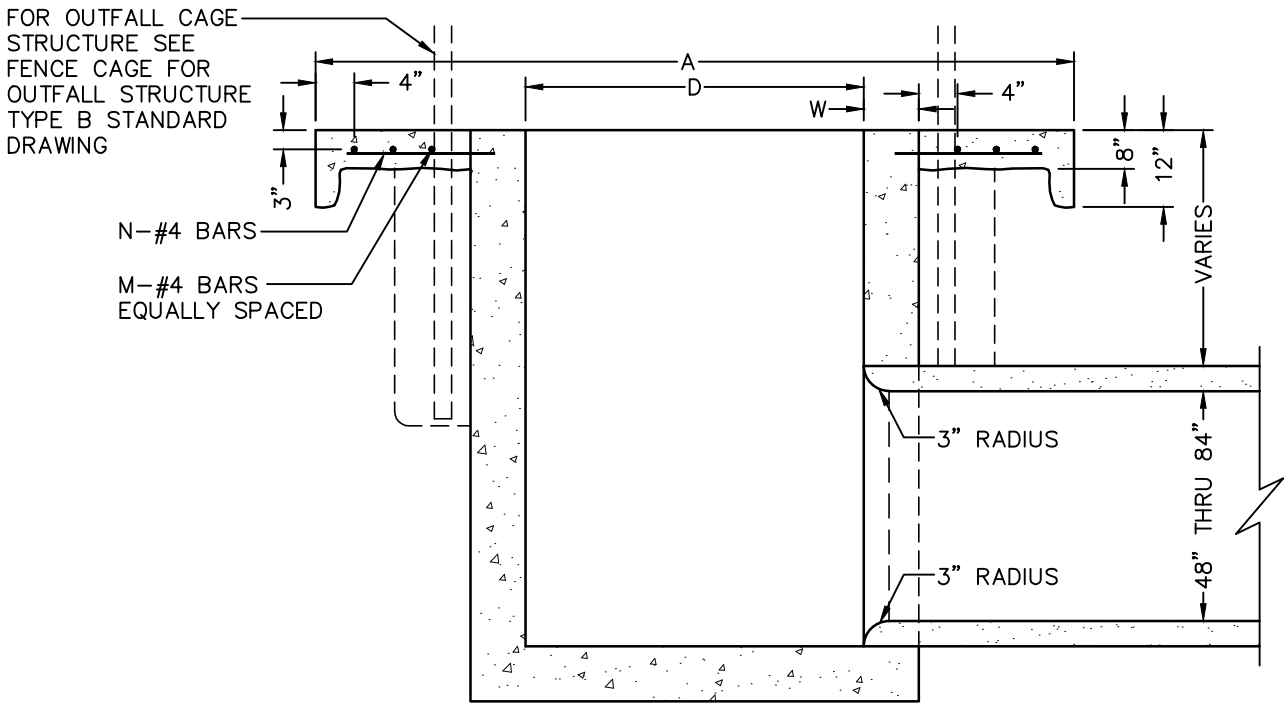
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

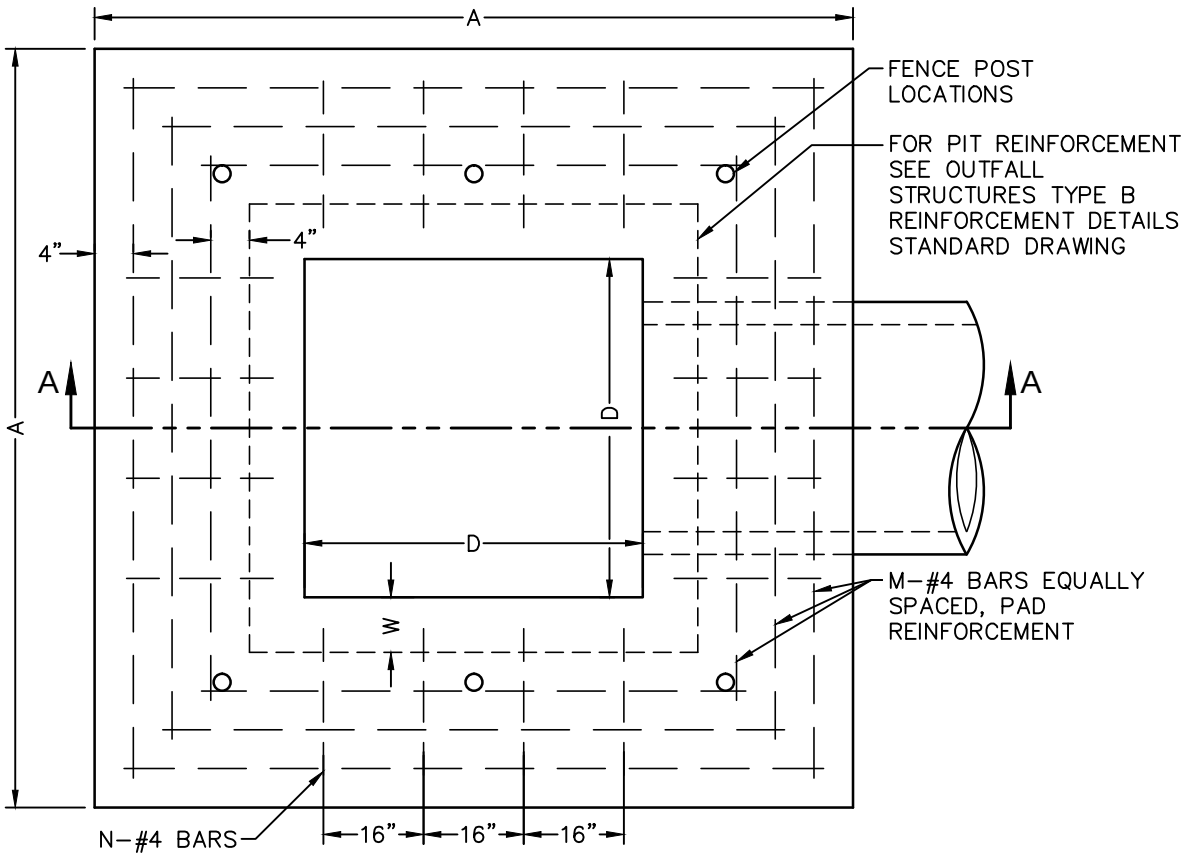
DESIGN TABLE FOR OUTFALL STRUCTURE TYPE A

REVISIONS
12/18/07
BK 2016

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SECTION A-A



PLAN

NOTES:

1. FOR DIMENSIONS SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE B STANDARD DRAWING.

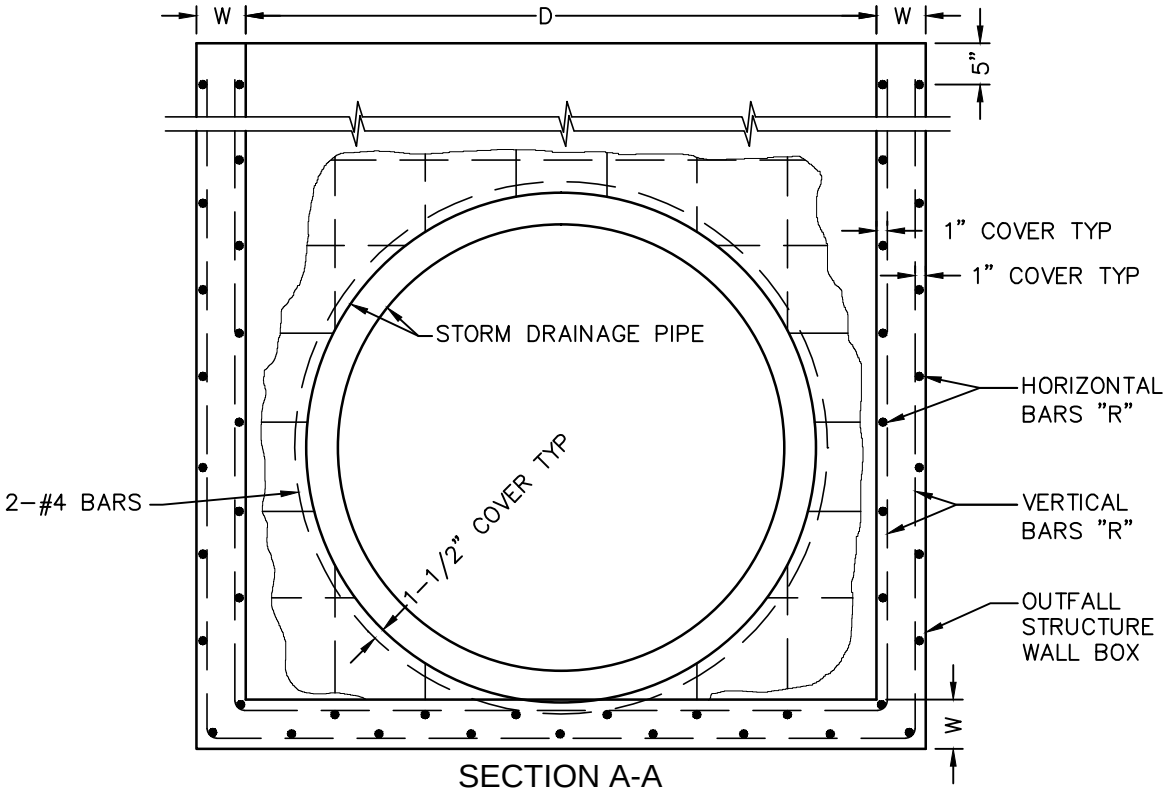
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

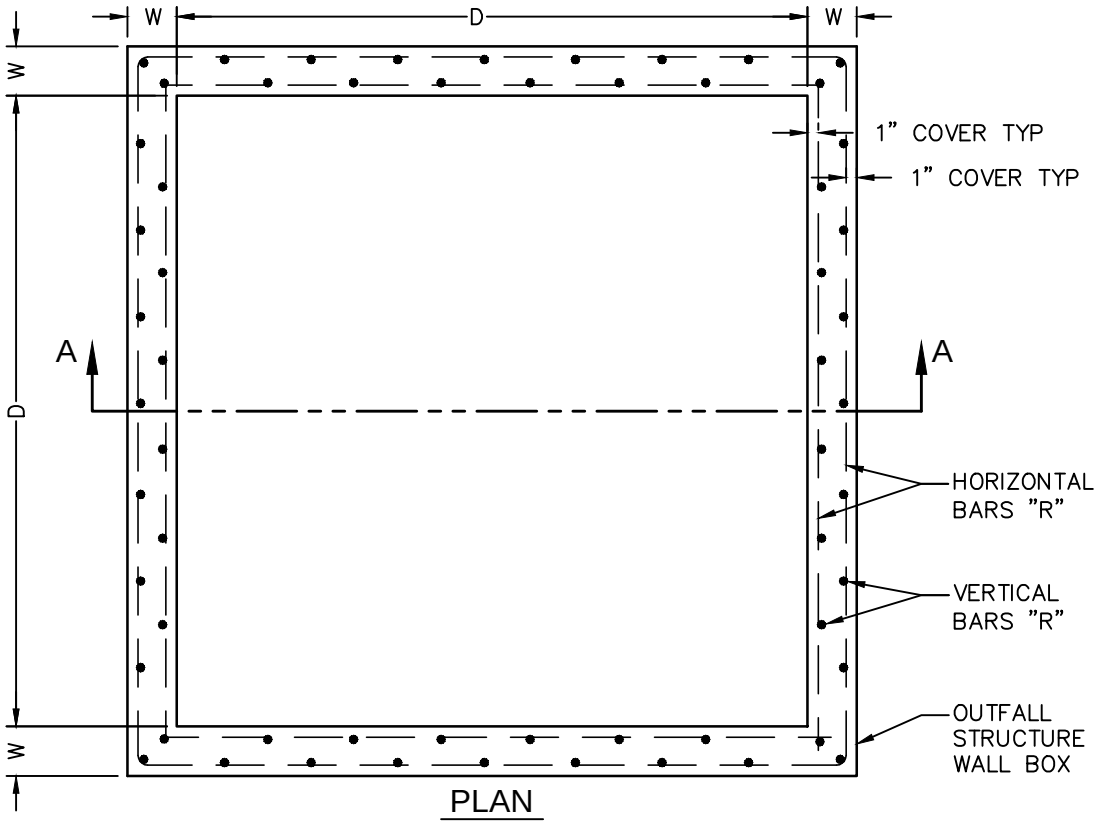
OUTFALL STRUCTURE TYPE B

REVISIONS
11/13/07
BK 2016

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SECTION A-A



PLAN

NOTES:

1. FOR DIMENSIONS AND REBAR SIZE AND SPACING SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE B STANDARD DRAWING.
2. ALL REINFORCEMENT SHALL CONFORM WITH THE CITY OF VISALIA STANDARD SPECIFICATIONS.

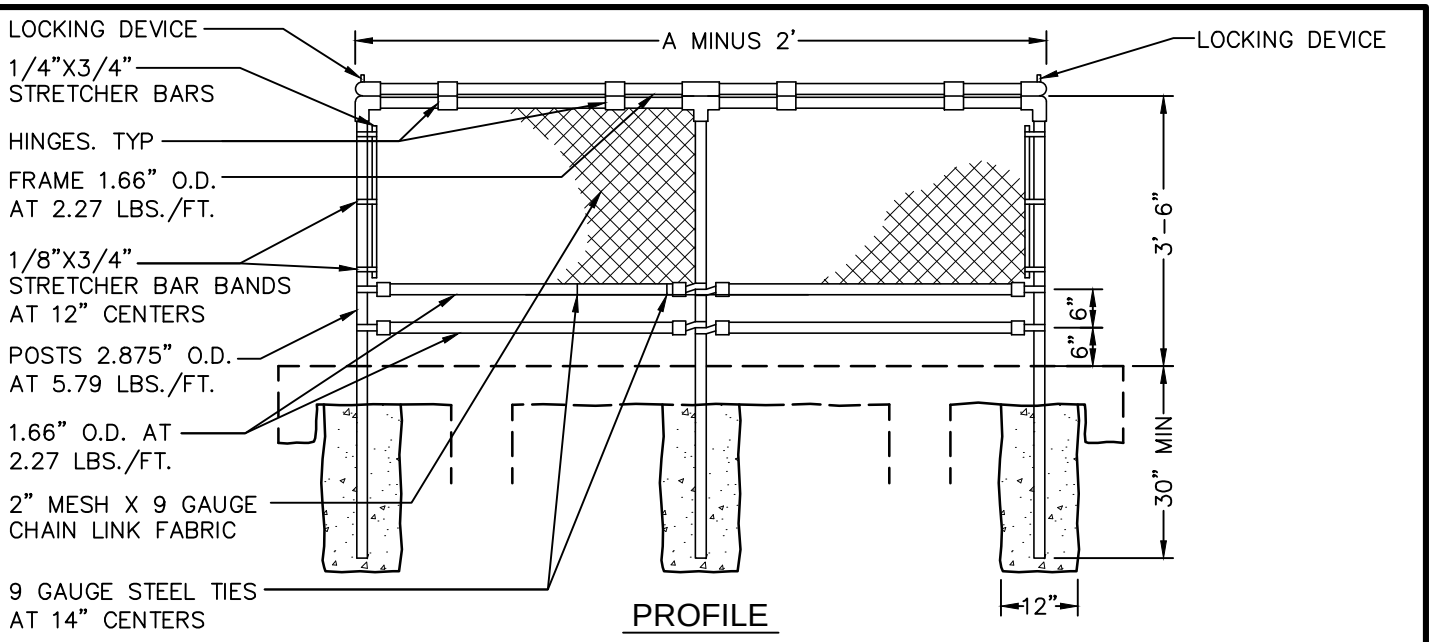
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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

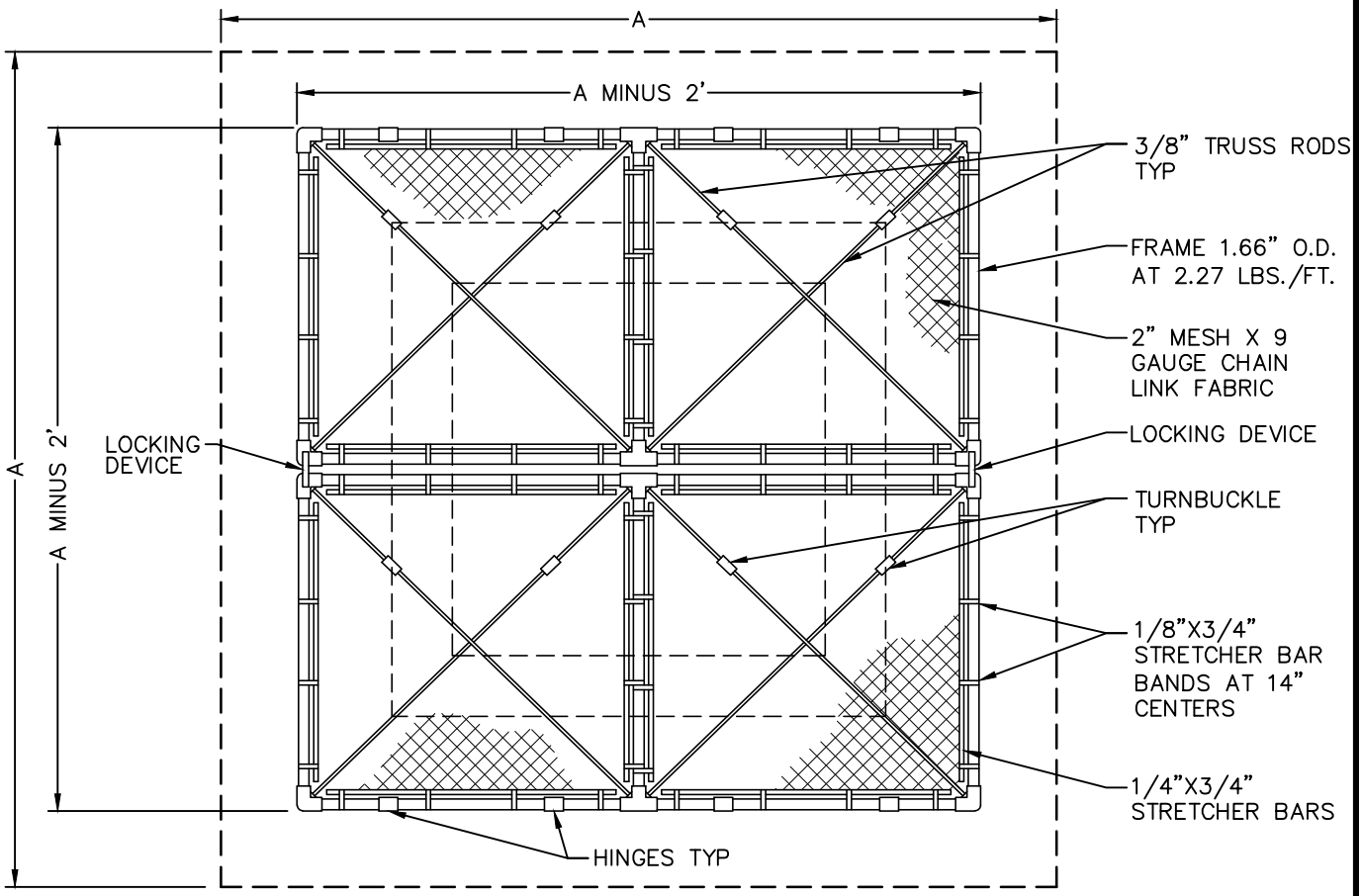
OUTFALL STRUCTURES TYPE B REINFORCEMENT DETAILS

REVISIONS
11/13/07
BK 2016

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PROFILE



PLAN

NOTES:

1. LOCKING DEVICE SHALL BE APPROVED BY THE CITY ENGINEER.
2. FOR DIMENSIONS SEE DESIGN TABLE FOR OUTFALL STRUCTURE TYPE B STANDARD DRAWING.

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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

FENCE CAGE FOR OUTFALL STRUCTURE TYPE B

REVISIONS
11/07/07
BK 2016

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TYPE	MAX PIPE SIZE	DESIGN (C.F.S.)	A	D	F	M	N	W	R*
B	48"	38–50	10'–0"	5'–0"	2'–6"	2	3	8"	#4 AT 12"
B	60"	50–65	12'–0"	6'–0"	3'–0"	3	4	8"	#4 AT 12"
B	66"	65–85	14'–0"	7'–0"	3'–6"	3	5	8"	#4 AT 12"
B	72"	85–110	16'–0"	8'–0"	4'–0"	3	6	10"	#5 AT 10"
B	84"	110–140	18'–0"	9'–0"	4'–6"	4	8	10"	#5 AT 10"

DESIGN TABLE
TYPE B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. REINFORCING BARS SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REINFORCING BARS SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
3. REINFORCING BARS SHALL HAVE A MINIMUM OF 2" OF CLEAR COVERAGE.

* REINFORCEMENT SHALL CONSIST OF A DOUBLE CURTAIN BOTH DIRECTIONS OF THE SIZE AND SPACING NOTED. SEE OUTFALL STRUCTURE TYPE B REINFORCEMENT DETAILS STANDARD DRAWING

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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

DESIGN TABLE FOR OUTFALL STRUCTURE TYPE B

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BK 2016

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RESERVED FOR FUTURE DETAIL

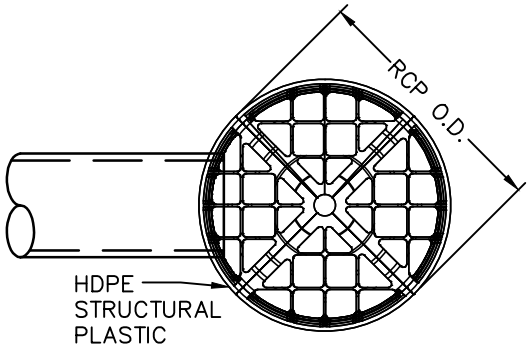
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RESERVED	REVISIONS BK 2016
	D-29

RESERVED FOR FUTURE DETAIL

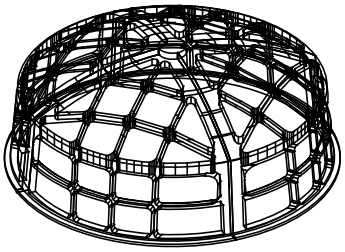
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RESERVED	REVISIONS BK 2016
	D-30

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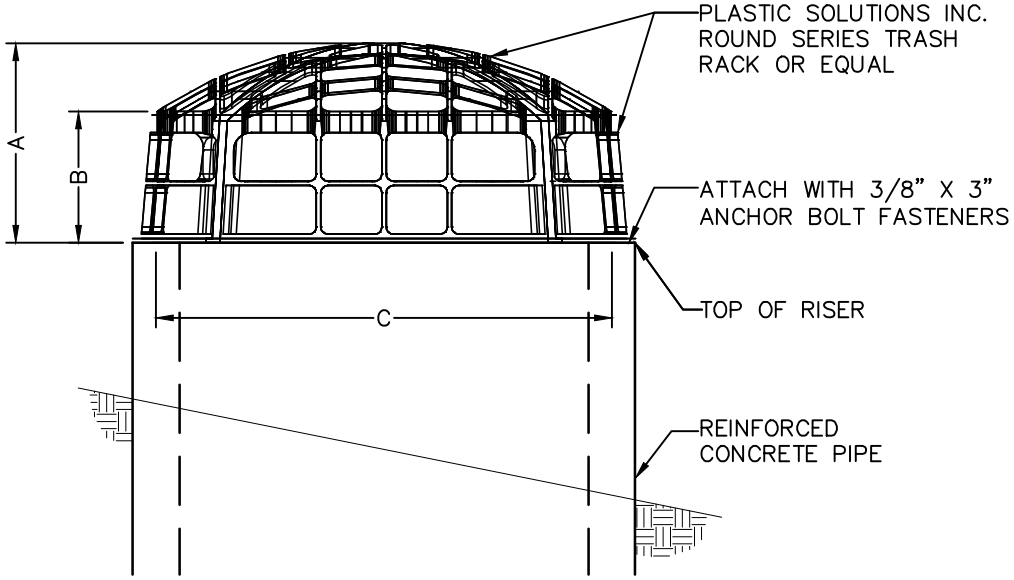
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RESERVED	REVISIONS BK 2016
	D–31



PLAN



PERSPECTIVE



PROFILE

ROUND SERIES TRASH RACKS FOR CONCRETE RISERS BY PLASTIC SOLUTIONS, INC. (DIMENSIONS IN INCHES)					
PART NO.	DIM. A	DIM. B	DIM. C	MIN. ID.	MIN. OD.
RS–24	17–1/4	14–1/4	28	24	30
RS–36	21–1/4	14–3/8	40–7/8	36	43
RS–48	27–3/4	18	54	48	57
RS–60	27–1/2	18–1/4	66–1/2	60	70

NOTES:

1. INLET STRUCTURE SHALL BE SIZED BY THE ENGINEER OF RECORD AND APPROVED BY THE CITY ENGINEER.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ROUND TRASH RACK FOR BASIN PUMP INLET STRUCTURE

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RESERVED FOR FUTURE DETAIL

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	D-33

RESERVED FOR FUTURE DETAIL

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RESERVED	REVISIONS BK 2016
	D-34

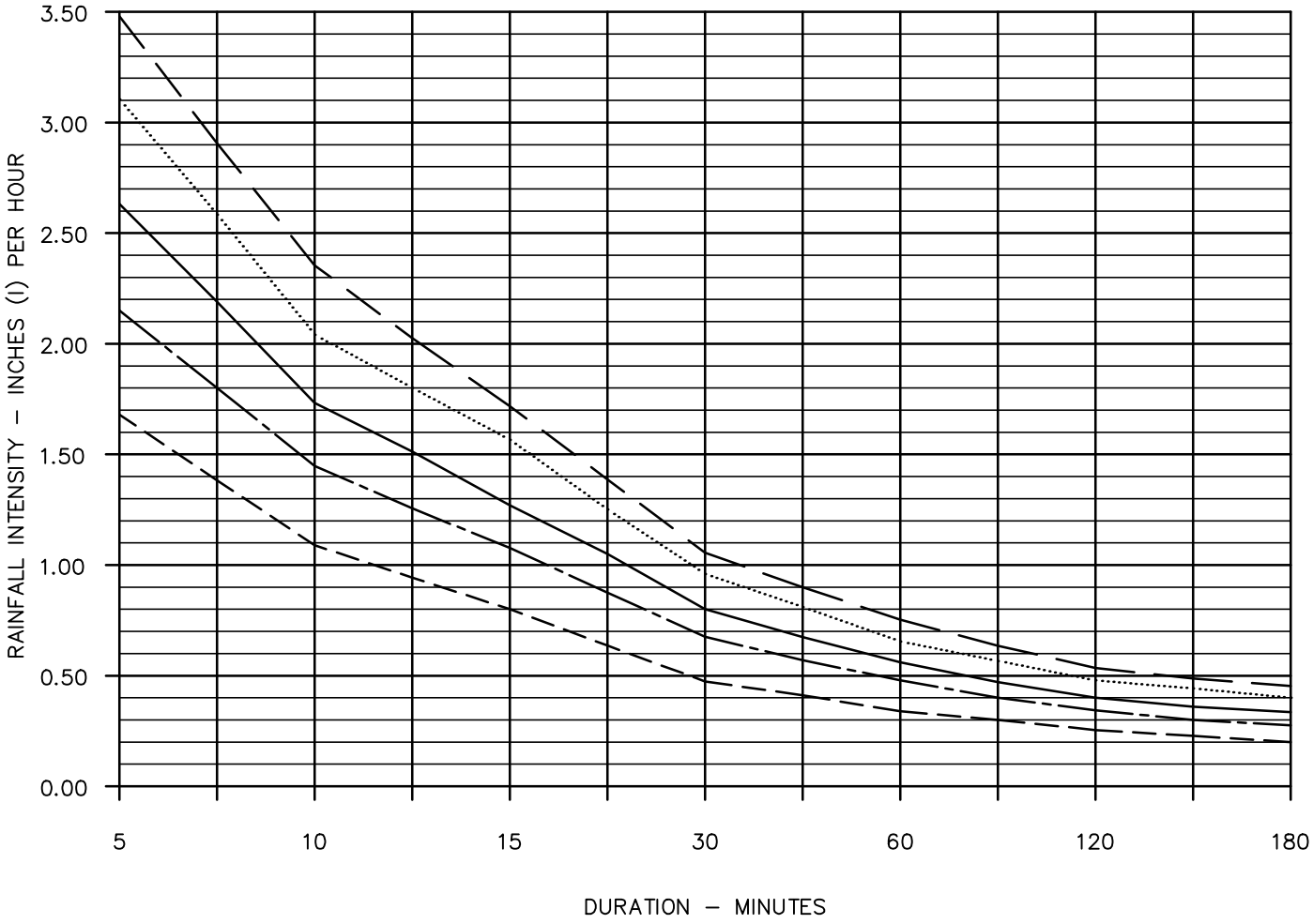
2 YEAR

5 YEAR

10 YEAR

25 YEAR

50 YEAR



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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

INTENSITY DURATION CURVES

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STORM DRAINAGE DESIGN CRITERIA

LEVEL OF PROTECTION

ITEM	VOLUME	LEVEL OF PROTECTION
MINOR (COLLECTOR) DRAINS	N/A	2 YEAR
MAJOR DRAINS	N/A	10 YEAR
IN-TOWN DETENTION BASINS	10 YEAR – 1 DAY	10 YEAR – 10 DAY
IN-TOWN RETENTION BASINS	10 YEAR – 10 DAY	10 YEAR – 10 DAY
INDUSTRIAL PARK RETENTION BASINS	10 YEAR – 10 DAY	10 YEAR – 10 DAY
DOWNSTREAM ULTIMATE STORAGE BASINS	10 DAY – 50 YEAR	10 DAY – 50 YEAR

NOTES:

1. MAJOR DRAINS GENERALLY SERVE AREAS IN EXCESS OF 100 ACRES. THESE DRAINS ARE DEFINED AND ANALYZED IN THE CITY'S STORM WATER MASTER PLAN.
2. MINOR DRAINS CONVEY RUNOFF TO THE MAJOR DRAINS AND GENERALLY SERVE AREAS LESS THAN 100 ACRES.
3. THE STORAGE VOLUME FOR DETENTION STORAGE IS BASED ON A 10-YEAR, 1-DAY STORM EVENT WITH A TOTAL RAINFALL OF 2.09 INCHES. THE BASIN SHALL ALSO ACCOMMODATE A 10-YEAR, 2-DAY EVENT WITH A TOTAL RAINFALL OF 2.64 INCHES WITH FREEBOARD AND PUMPING TAKEN INTO ACCOUNT. THE MAXIMUM DESIGN DEPTH AND SIDE SLOPES OF THE BASIN MUST BE APPROVED BY THE CITY. DISCHARGE PUMPS WITH A CITY APPROVED CAPACITY SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH CITY STORM WATER DISCHARGE POLICIES.
4. THE STORAGE VOLUME FOR RETENTION STORAGE IS BASED ON A 10-YEAR, 10-DAY STORM EVENT WITH A TOTAL RAIN FALL OF 4.17 INCHES. DISCHARGE PUMPS CAN ONLY BE INSTALLED AND OPERATED WITH THE APPROVAL OF THE CITY.
5. THE DESIGN WATER SURFACE ELEVATION IN A BASIN SHALL BE A MINIMUM OF ONE FOOT BELOW THE LOWEST CATCH BASIN IN THE AREA THAT IS TRIBUTARY TO THE BASIN.
6. THE CITY DOES NOT CONSIDER PERCOLATION/INFILTRATION FACTORS IN SIZING BASINS.

RATIONAL METHOD RUNOFF COEFFICIENTS AND DESIGN CRITERIA FOR STORM WATER BASINS

LAND USE	COEFFICIENT OF RUNOFF (C)	STORAGE VOLUME (ACRE-FEET/ACRE)	
		DETENTION	RETENTION
INDUSTRIAL AND COMMERCIAL	0.85	0.148	0.295
PROFESSIONAL OFFICE	0.65	0.113	0.226
RESIDENTIAL			
– HIGH DENSITY (15-29 UNITS/ACRE)	0.55	0.096	0.191
– MEDIUM DENSITY (11-14 UNITS/ACRE)	0.45	0.078	0.156
– LOW DENSITY (3-10 UNITS/ACRE)	0.35	0.061	0.122
– RURAL (1-2 UNITS/ACRE)	0.30	0.052	0.104
PUBLIC/INSTITUTIONAL	0.40	0.070	0.139
OPEN SPACE			
– IMPROVED (PARKS)	0.25	0.044	0.087
– UNIMPROVED	0.15	0.026	0.052

DESIGN CRITERIA

1. THE RATIONAL METHOD MAY BE USED TO DETERMINE PEAK FLOWS AND RUNOFF VOLUMES FOR AREAS LESS THAN 150 ACRES.
2. ALL NEW DEVELOPMENTS SHALL BE DESIGNED SUCH THAT THE SURFACE OF PONDED WATER DURING THE 100-YEAR RAINFALL EVENT DOES NOT RISE MORE THAN ONE FOOT ABOVE THE LOWEST TOP OF CURB IN THE DEVELOPMENT.
3. LOT TO STREET TIME = 25 MINUTES. (RESIDENTIAL ONLY)
4. GUTTER VELOCITY = 2 FEET PER SECOND.

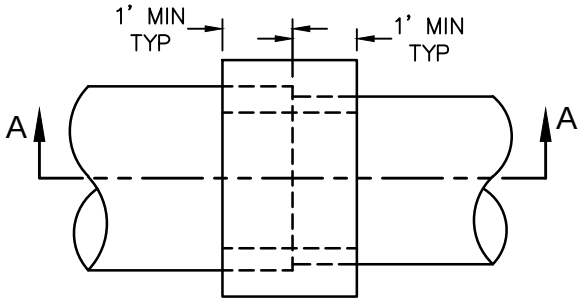
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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

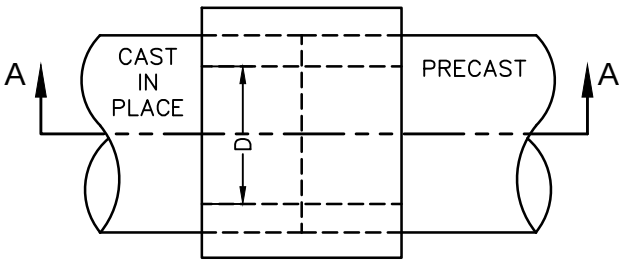
DESIGN CRITERIA FOR DRAINAGE

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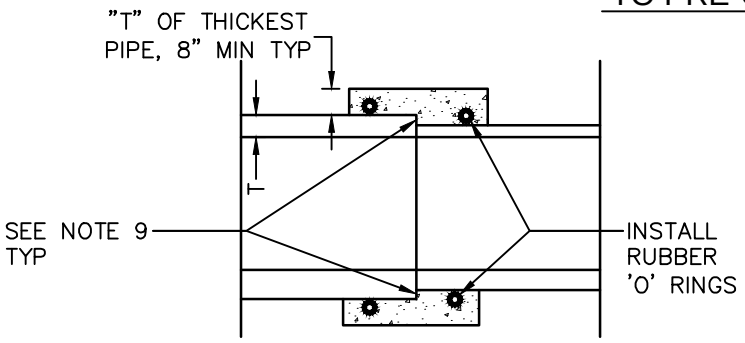
D-36



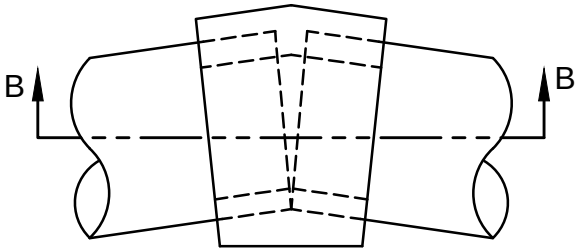
JOINING DISSIMILAR PIPES



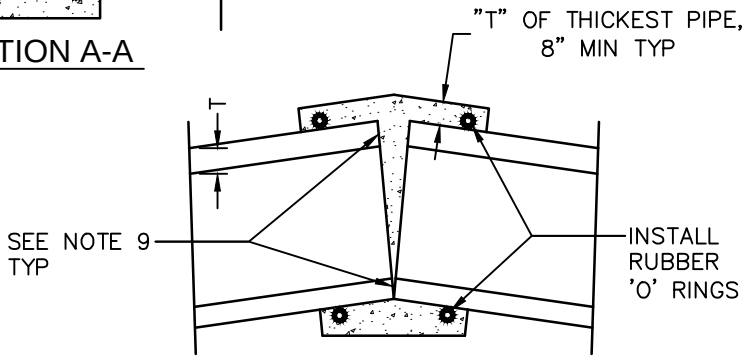
JOINING CAST-IN-PLACE TO PRE-CAST PIPES



SECTION A-A



ANGLE EXCEEDING NORMAL DEFLECTION ANGLE*



SECTION B-B

NOTES:

1. CONCRETE COLLAR SHALL BE CLASS 2 CONCRETE.
2. INSIDE COLLAR SHALL MATCH PIPE DIAMETER, SMOOTH STEEL TROWEL FINISH.
3. ALLOW CONCRETE TO HARDEN BEFORE BACKFILLING.
4. WHEN FORMING ANGLES ENGINEER MAY REQUIRE CHAMFERING OF PIPE ENDS.
5. JOINTS SHALL BE WATER TIGHT.
6. THIS DETAIL IS NOT FOR USE WITH PVC/PLASTIC PIPES. JOINING OF PVC/PLASTIC PIPES SHALL BE AS APPROVED BY THE CITY ENGINEER.
7. THIS DETAIL MAY BE USED FOR PIPES UP TO 48" IN DIAMETER. COLLARS FOR PIPES LARGER THAN 48" SHALL BE AS APPROVED BY THE CITY ENGINEER.
8. EXFILTRATION TEST REQUIRED AS PER ASTM C969–02 AS IMPLEMENTED BY THE CITY OF VISALIA.
9. CONTRACTOR SHALL INSTALL A QUICK SETTING TYPE HYDRAULIC CEMENT TO ALL JOINTS PRIOR TO POURING CONCRETE COLLAR. HYDRAULIC CEMENT SHALL BE A NON–SHRINKING, NON–METALLIC AND NON–CORROSIVE TYPE WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5,000 P.S.I. HYDRAULIC CEMENT DATA SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. JOINT SEAL SHALL BE WATER TIGHT.

* THIS INSTALLATION METHOD SHALL ONLY BE USED WHERE APPROVED BY THE CITY ENGINEER IN WRITING. SEE NOTE 4.

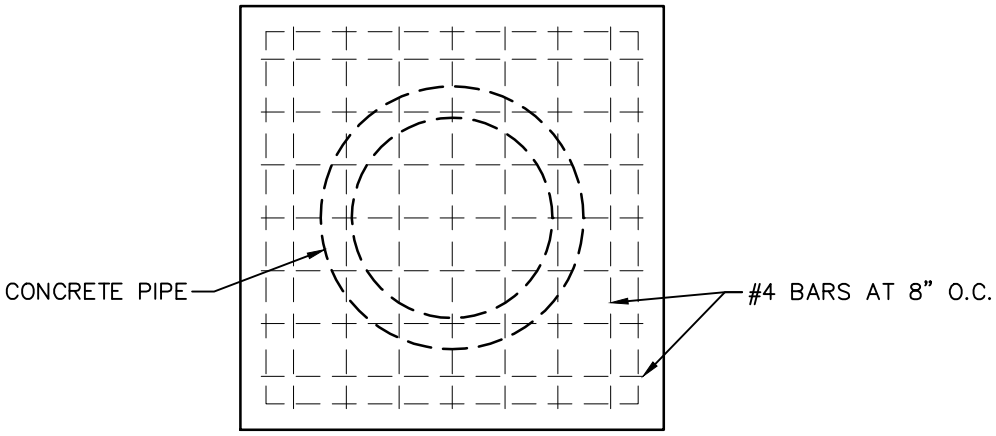
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

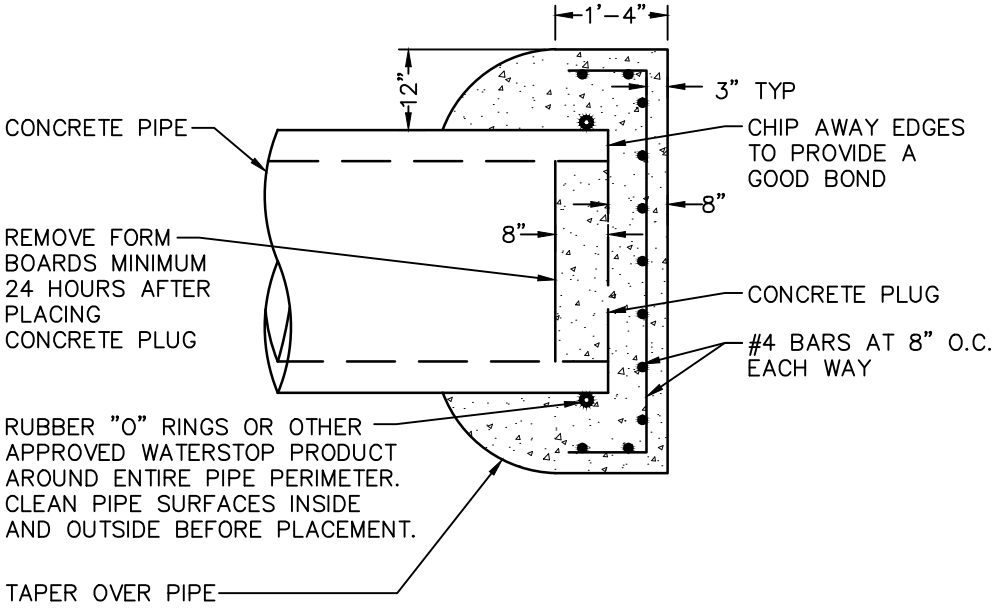
CONSTRUCTION JOINT CONCRETE FILLED COLLAR

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FRONT VIEW



SECTION

NOTES:

1. END PLUG SHALL ONLY BE USED WHERE APPROVED BY THE CITY ENGINEER.
2. THIS PLUG SHALL BE USED ON PIPES WITH AN INNER DIAMETER OF 12" UP TO 48". END PLUGS FOR PIPES WITH AN INNER DIAMETER LARGER THAN 48" SHALL BE DESIGNED BY THE ENGINEER OF RECORD AND APPROVED BY THE CITY ENGINEER.
3. REBAR AND CONCRETE SHALL COMPLY WITH THE CITY OF VISALIA STANDARD SPECIFICATIONS.
4. CONCRETE SHALL BE CLASS 2.
5. PIPE END PLUG SHALL BE WATER TIGHT.
6. EXFILTRATION TEST REQUIRED AS PER ASTM C969-02 AS IMPLEMENTED BY THE CITY OF VISALIA.

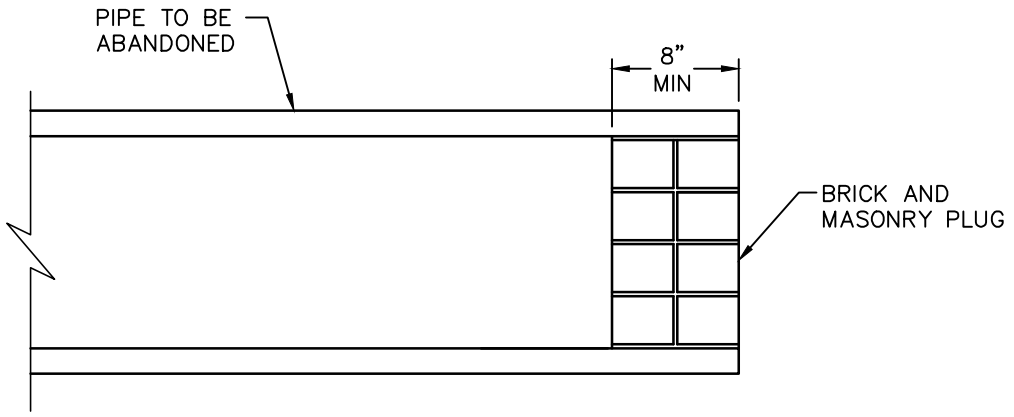
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

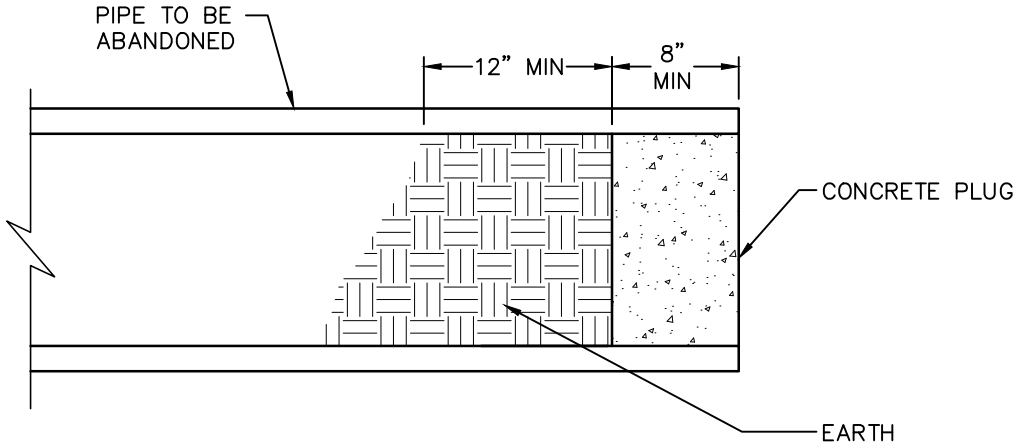
PIPE END PLUG FOR CONCRETE PIPE

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12" TO 48" DIAMETER PIPE

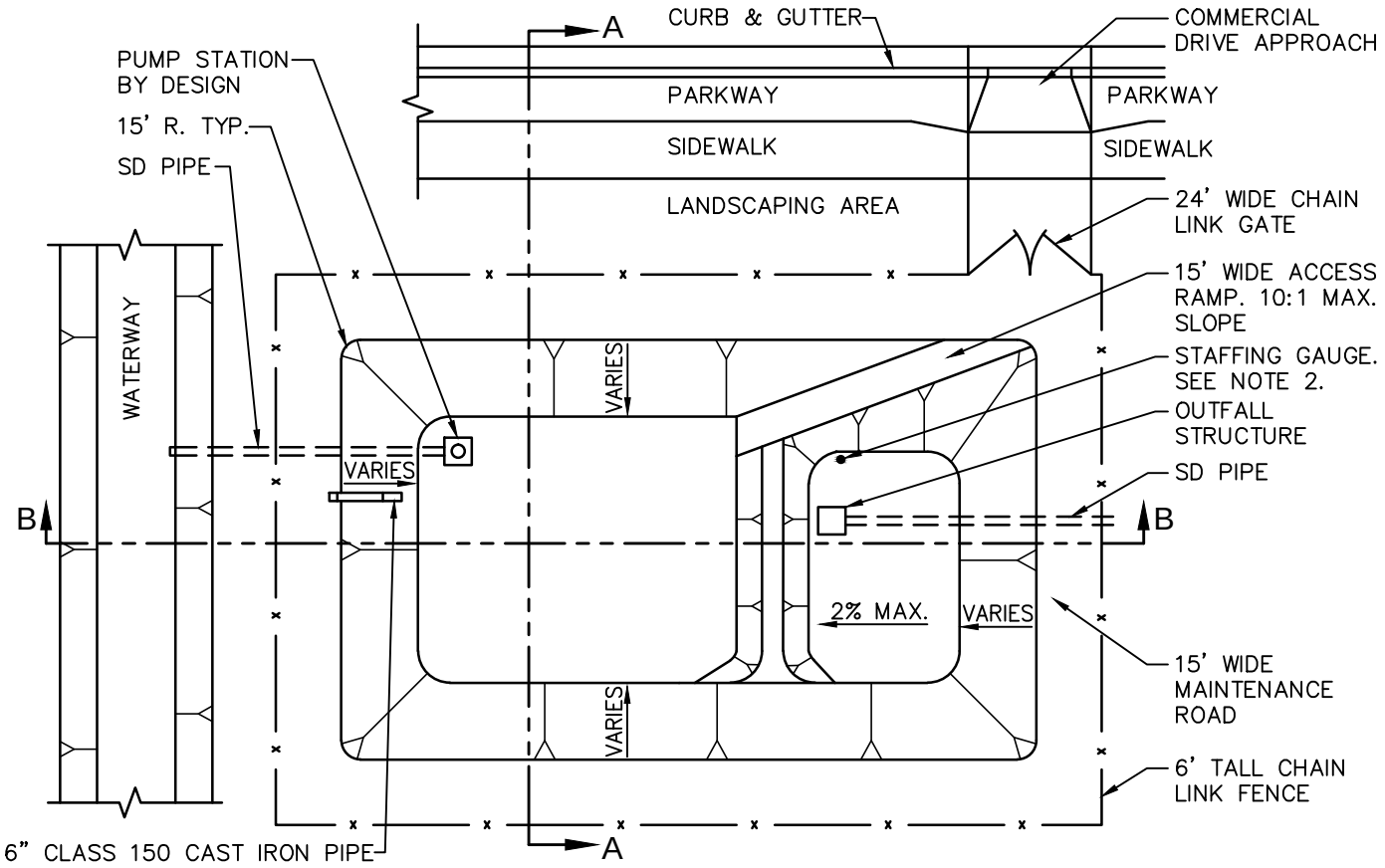


10" DIAMETER PIPE AND SMALLER

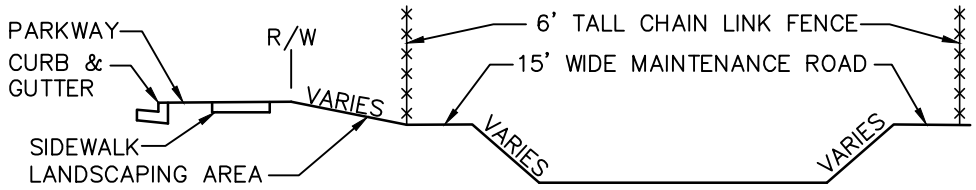
NOTES:

1. PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE ENGINEER.
2. WHERE REQUIRED BY THE CITY ENGINEER, ABANDONED PIPES 12" AND LARGER, SHALL BE FILLED COMPLETELY WITH CEMENT SLURRY BACKFILL.
3. ALL PLUGS SHALL COMPLY WITH THE CITY OF VISALIA STANDARD SPECIFICATIONS.
4. PIPE END PLUG SHALL BE WATER TIGHT.
5. VIDEO INSPECTION REQUIRED PRIOR TO ABANDONMENT OF PIPE.

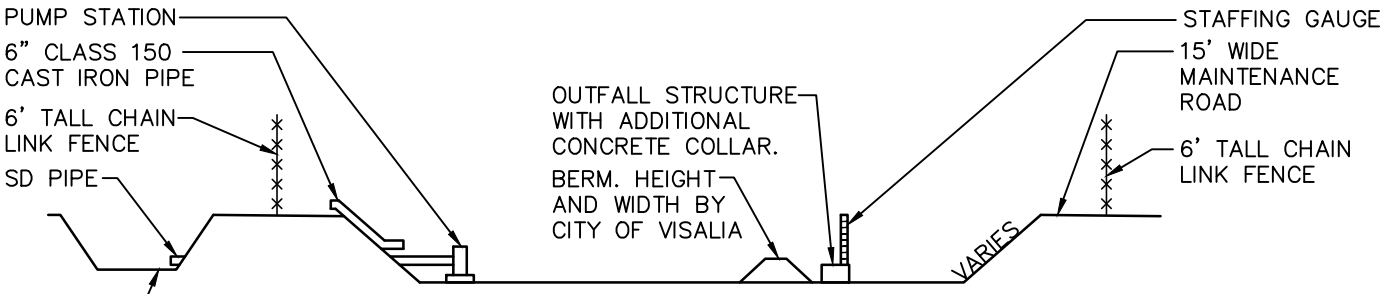
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
ABANDONED SANITARY SEWER AND STORM DRAIN PIPE PLUG	REVISIONS 06/14/13 BK 2016 / D-39



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. REQUIREMENTS PER BASIN TO BE APPROVED BY CITY ENGINEER.
2. STAFFING GAUGE TO BE 4" GALVANIZED POLE. WHITE REFLECTIVE TAPE TO BE PLACED EVERY FOOT STARTING AT THE TOP OF BANK TO THE BOTTOM OF THE BANK. RED REFLECTIVE TAPE SHALL BE PLACED AT THE HIGH WATER LINE. EMBEDDING DEPTH AND FOOTING TO BE DETERMINED WITH PLANS.

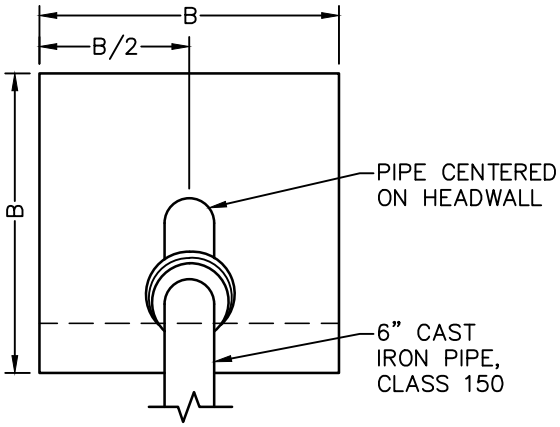
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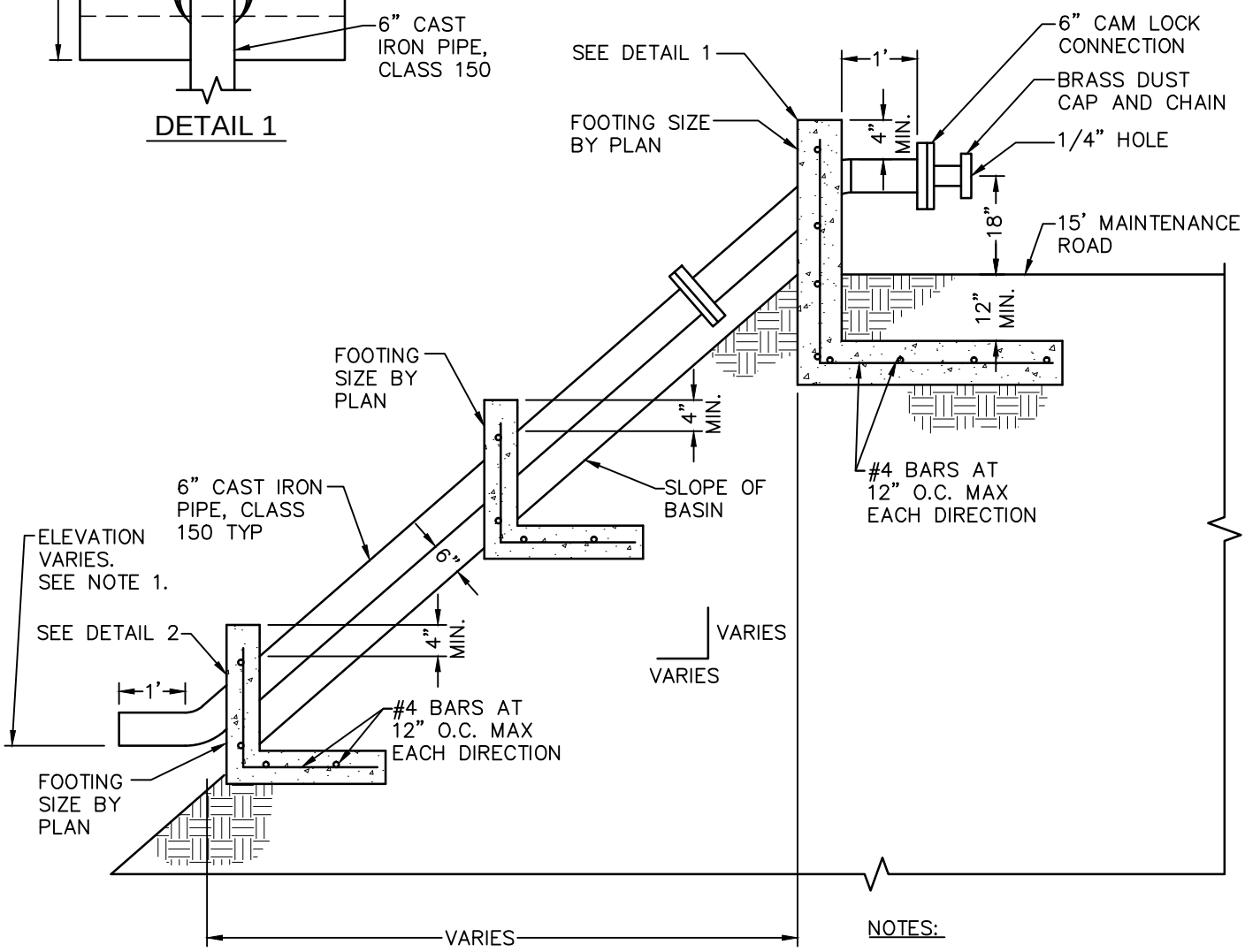
PONDING BASIN 1 OF 2

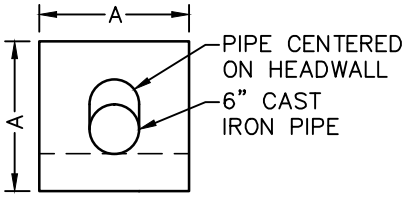
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DETAIL 1





DETAIL 2

NOTES:

1. SET INLET PIPE ELEVATION BELOW MIDPOINT OF BASIN HIGHWATER LINE AND BOTTOM OF BASIN.
2. ALL CONCRETE SHALL BE CLASS 2.

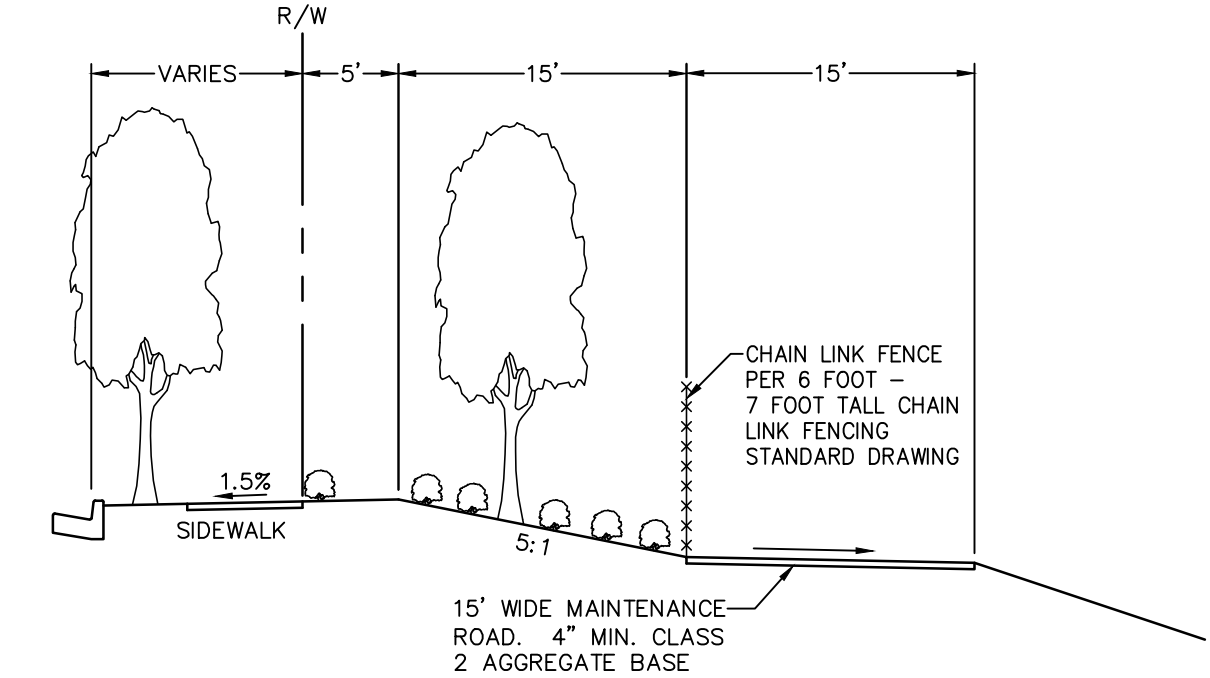
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CITY ENGINEER R.P.E. 81734 DATE

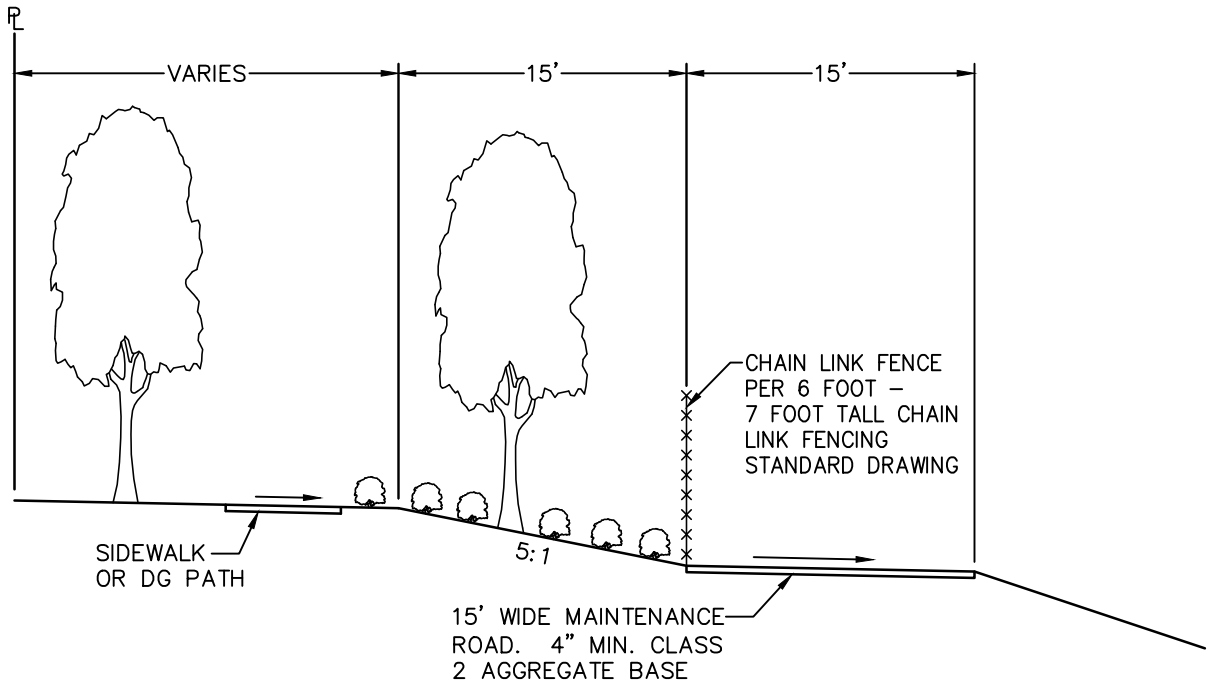
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PONDING BASIN 2 OF 2

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NOTES:

1. REFER TO CONCRETE IMPROVEMENT STANDARD DRAWINGS FOR SIDEWALK AND PARKWAY REQUIREMENTS.
2. DESIGN SHALL MINIMIZE EROSION.
3. SIDE SLOPE STABILIZATION AND HYDROSEEDING REQUIREMENTS PER CITY STANDARD SPECIFICATIONS OR AS DIRECTED BY THE CITY ENGINEER.

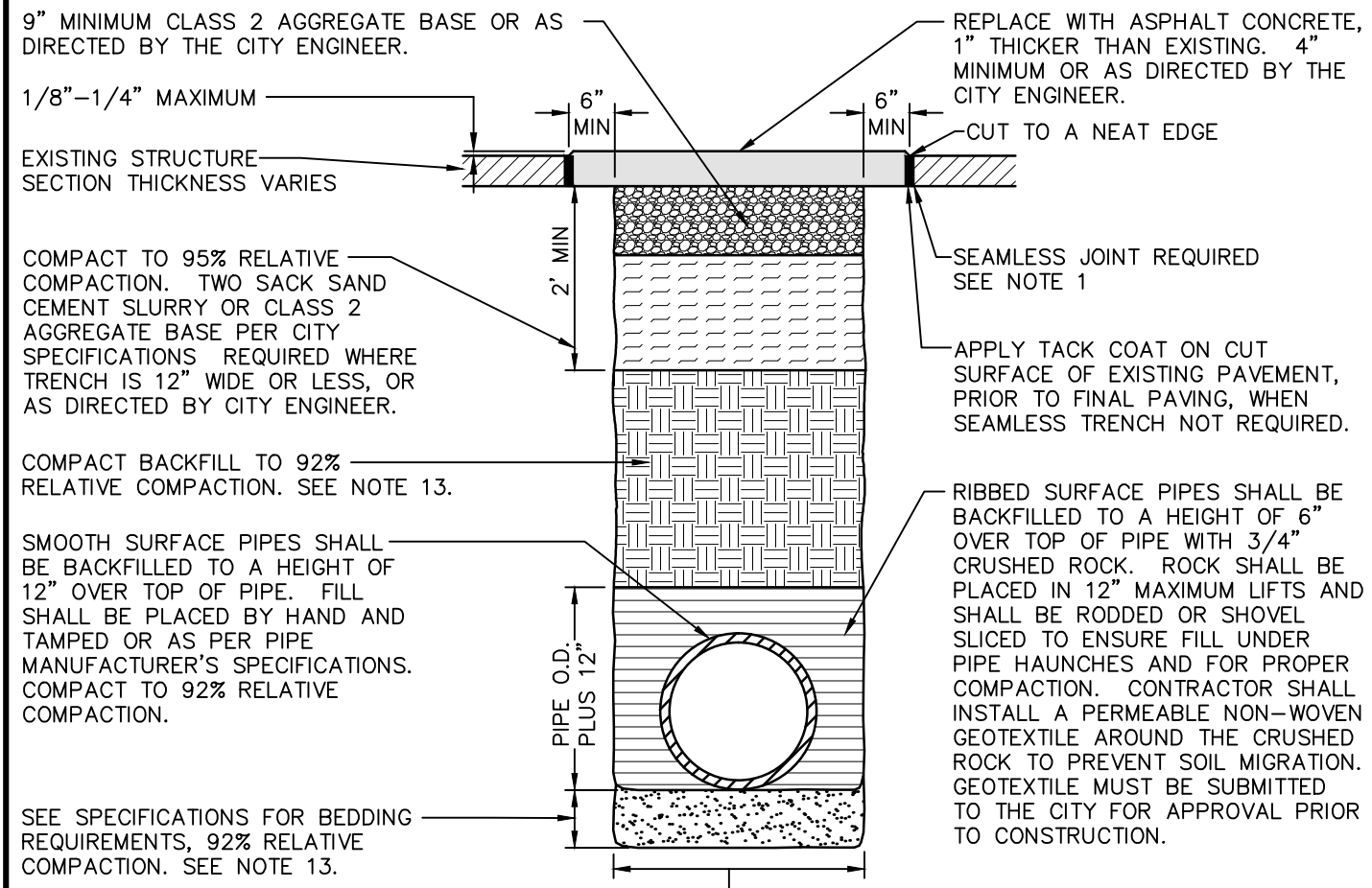
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

BASIN PERIMETER LANDSCAPING SECTION

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NOTES:

1. ALL CUTS IN EXISTING PAVEMENT THAT IS LESS THAN EIGHT YEARS OLD OR AS DIRECTED BY THE CITY ENGINEER SHALL BE REQUIRED TO HAVE SEAMLESS JOINTS WITH THE EXISTING PAVEMENT BY USING A HEATER–REMIX PROCESS.
2. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE CITY OF VISALIA STANDARD SPECIFICATIONS.
3. ALL PROVISIONS AND REQUIREMENTS OF THE CITY OF VISALIA MUNICIPAL CODE SHALL BE FOLLOWED.
4. STREET CUTS SHALL BE MADE PARALLEL OR AT RIGHT ANGLES TO THE CENTERLINE OF THE STREET.
5. ALL TRENCHES UNDER EXISTING CURB AND GUTTER OR OTHER CITY STRUCTURES SHALL REQUIRE A TWO SACK CEMENT SLURRY BACKFILL. CEMENT SLURRY BACKFILL SHALL HAVE NOT LESS THAN 188 POUNDS OF CEMENT PER CUBIC YARD OF MATERIAL PRODUCED.
6. MANHOLE AND WATER VALVE RAISING ASSOCIATED WITH NEW STREET CONSTRUCTION IS NOT REQUIRED TO FOLLOW NOTE 1.
7. MOISTURE CONDITION AND MIX BACKFILL MATERIAL PRIOR TO PLACEMENT.
8. TEMPORARY TRENCH RESURFACING SHALL CONSIST OF A MINIMUM OF 2" COLD MIX AND SHALL BE REQUIRED WHENEVER THE STREET IS TEMPORARILY OPENED TO TRAFFIC. ALL TEMPORARY MATERIAL SHALL BE COMPLETELY REMOVED PRIOR TO FINAL PAVING.
9. TRENCH RESURFACING STRUCTURAL SECTION IN OTHER THAN PERMANENTLY PAVED OR UNPAVED AREAS SHALL BE DETERMINED BY THE CITY ENGINEER.
10. NO JETTING OR FLOODING OF TRENCH BACKFILL WILL BE ALLOWED. BACKFILL IS TO BE PLACED IN MAXIMUM 8" LOOSE LIFTS, THEN COMPACTED AS DIRECTED BY THE CITY ENGINEER.
11. FOR UTILITY POTHOLES WITH DIAMETER 9" OR LESS OR MAXIMUM DIMENSION IN ANY DIRECTION OF 9" OR LESS, OR WHERE DIRECTED BY THE ENGINEER, BACKFILL SHALL COMPLY WITH THE STANDARD CITY DRAWING FOR UTILITY POTHOLE BACKFILL.
12. IF THERE IS LESS THAN 2 FEET BETWEEN THE EDGE OF A TRENCH CUT AND A CONCRETE IMPROVEMENT, OR EDGE OF PAVING, THEN REMOVE AND REPLACE THE A.C. PAVEMENT FROM THE EDGE OF THE TRENCH CUT TO THE CONCRETE IMPROVEMENT, OR EDGE OF PAVING.
13. UNLESS OTHERWISE NOTED BACKFILL AND BEDDING SHALL BE CLEAN GRANULAR NATIVE MATERIAL PER CITY SPECIFICATIONS.

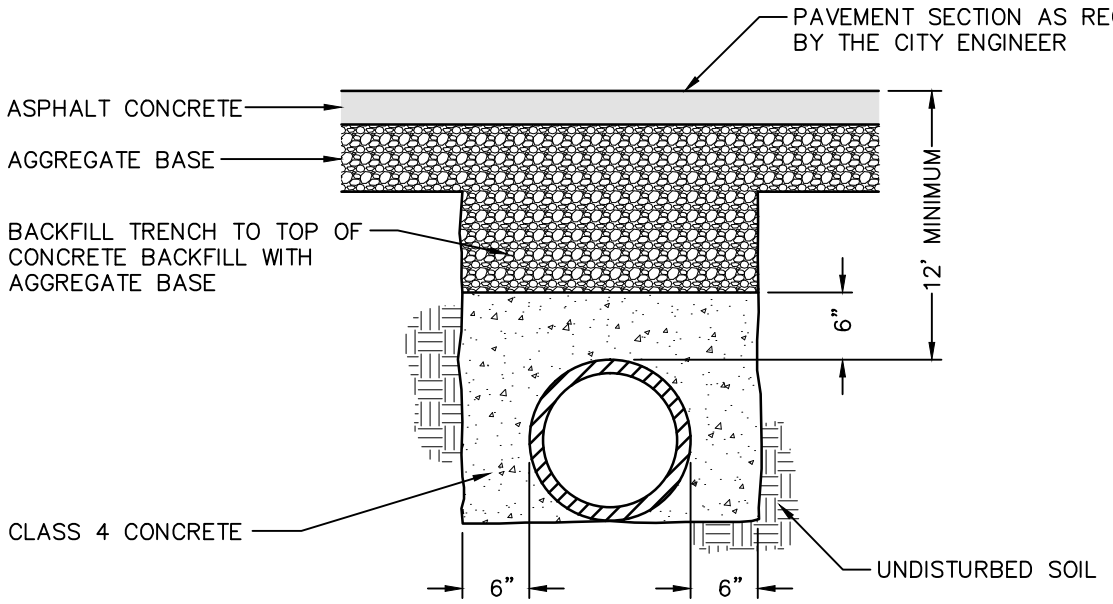
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

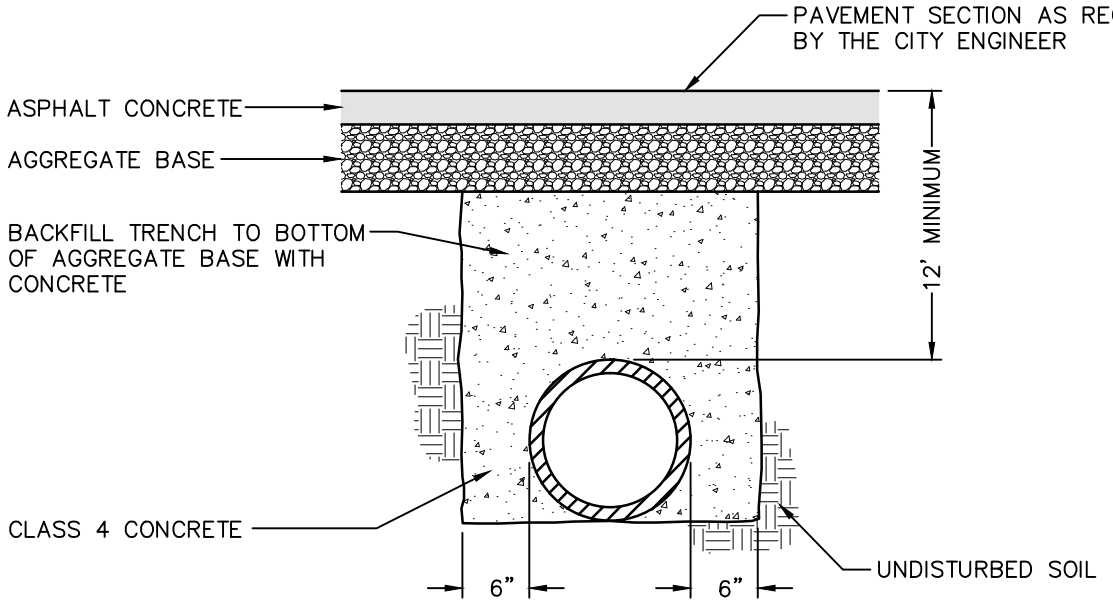
TRENCH BACKFILL/PATCH PAVING

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E–1



OPTION 1



OPTION 2

NOTES:

1. PIPE CONCRETE BACKFILL SHALL BE REQUIRED FOR ALL PIPE INSTALLED WITH LESS THAN 24" OF COVER OR AS DIRECTED BY THE CITY ENGINEER.
2. ALL CONCRETE BACKFILL SHALL BE CLASS 4 CONCRETE.
3. CONCRETE BACKFILL SHALL BE PLACED IN THE TRENCH AGAINST UNDISTURBED SOIL AND SHALL BE PLACED IN A MANNER THAT WILL PREVENT FLOATING OR SHIFTING OF THE PIPE.
4. FOREIGN MATERIAL WHICH FALLS INTO THE TRENCH DURING PLACEMENT OF THE CONCRETE SHALL BE IMMEDIATELY REMOVED.
5. NO MATERIAL SHALL BE PLACED ON TOP OF THE CONCRETE BACKFILL UNTIL 8 HOURS AFTER PLACING THE CONCRETE BACKFILL, AS DIRECTED BY THE CITY ENGINEER.
6. TRENCH SHALL BE BACKFILLED AND RE-SURFACED PER TRENCH BACKFILL/PATCH PAVING STANDARD DRAWING.

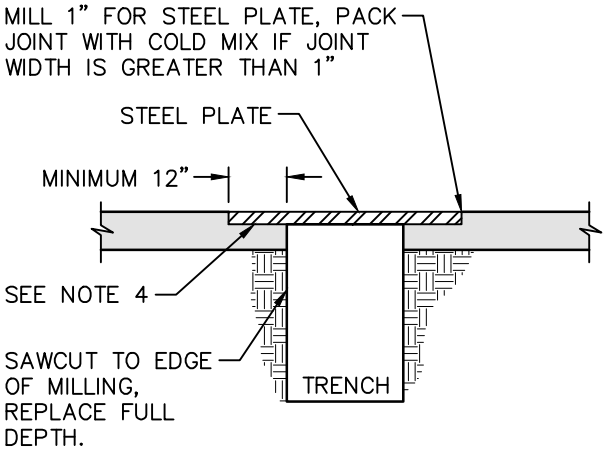
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

PIPE CONCRETE BACKFILL

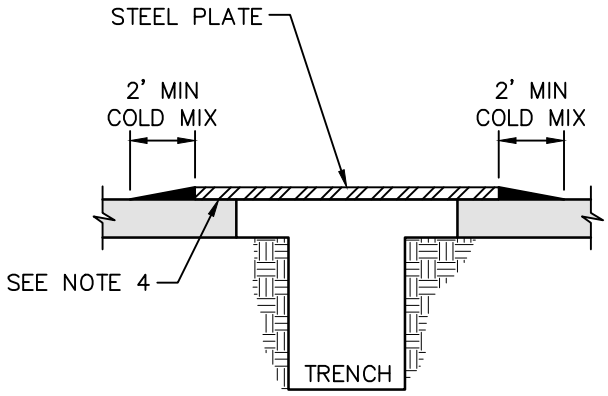
REVISIONS
06/14/13
BK 2016

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TYPE "A" PLATING

CITY POSTED SPEEDS OF GREATER THAN 25 MPH OR BUS & TRUCK ROUTE



TYPE "B" PLATING

CITY POSTED SPEEDS OF 25 MPH AND UNDER

TRENCH WIDTH	MINIMUM PLATE THICKNESS
10" (0.25 M)	1/2" (13 MM)
1'–11" (0.58 M)	3/4" (19 MM)
2'–7" (0.80 M)	7/8" (22 MM)
3'–5" (1.04 M)	1" (25 MM)
5'–3" (1.60 M)	1 1/4" (32 MM)

NOTES:

1. WHEN BACKFILLING OPERATIONS CANNOT BE PROPERLY COMPLETED WITHIN A WORK DAY, STEEL PLATES SHALL BE INSTALLED USING EITHER TYPE "A" OR TYPE "B" PLATING METHODS, OR AS DIRECTED BY CITY ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF THE STEEL PLATES, SHORING OR BRACING OF THE TRENCH AND ENSURING THAT THEY MEET THE MINIMUM SPECIFICATIONS OF CALTRANS TR–0157.
2. USE OF STEEL PLATE BRIDGING SHOULD NOT EXCEED 4 CONSECUTIVE WORKING DAYS IN ANY GIVEN WEEK.
3. THE TRENCH SHALL BE ADEQUATELY SHORED OR BRACED TO SUPPORT THE STEEL PLATE BRIDGING AND TRAFFIC LOADS.
4. THE CONTRACTOR SHALL PROVIDE ADEQUATE OVERLAP OF PLATE ON ASPHALT TO ASSURE NO SLIPPAGE OF PLATE AND NO COLLAPSING OF TRENCH. PLATES SHALL BE PINNED TO THE PAVEMENT SURFACE, WITH A MINIMUM OF 2 DOWELS PRE–DRILLED INTO THE CORNERS OF THE PLATE AND DRILLED 2" INTO THE PAVEMENT, WITH A MINIMUM 1' OVERLAP ONTO EXISTING STABLE MATERIAL. WHEN STEEL PLATES ARE REMOVED, THE DOWEL HOLES IN THE PAVEMENT SHALL BE BACKFILLED WITH EITHER GRADED FINES OF ASPHALT CONCRETE MIX, CONCRETE SLURRY OR AN EQUIVALENT SLURRY THAT IS APPROVED BY CITY ENGINEER.
5. STEEL PLATES USED IN THE TRAVELED PORTION OF THE RIGHT OF WAY SHALL HAVE A SURFACE THAT WAS MANUFACTURED WITH A NOMINAL COEFFICIENT OF FRICTION (COF) OF 0.35 AS DETERMINED BY CALIFORNIA TEST METHOD 342, OR AS APPROVED BY CITY ENGINEER. SURFACING REQUIREMENTS ARE NOT NECESSARY FOR STEEL PLATES USED IN PARKING STRIPS, ON SHOULDERS NOT USED FOR TURNING MOVEMENTS, OR ON CONNECTING DRIVEWAYS, ETC. NOT OPEN TO THE PUBLIC. FOR SPANS GREATER THAN 5'–3", A STRUCTURAL DESIGN SHALL BE PREPARED BY A CALIFORNIA REGISTERED CIVIL ENGINEER.
6. ALL STEEL PLATES WITHIN THE RIGHT OF WAY, WHETHER USED IN OR OUT OF THE TRAVELED WAY, SHALL BE WITHOUT DEFORMATION.
7. A ROUGH ROAD SIGN (W8–8) WITH BLACK LETTERING ON AN ORANGE BACKGROUND SHALL BE USED IN ADVANCE OF STEEL PLATES IN ADDITION TO ANY OTHER REQUIRED CONSTRUCTION SIGNING.
8. "POSTED SPEED" DOES NOT INCLUDE TEMPORARY CONSTRUCTION SIGNING.

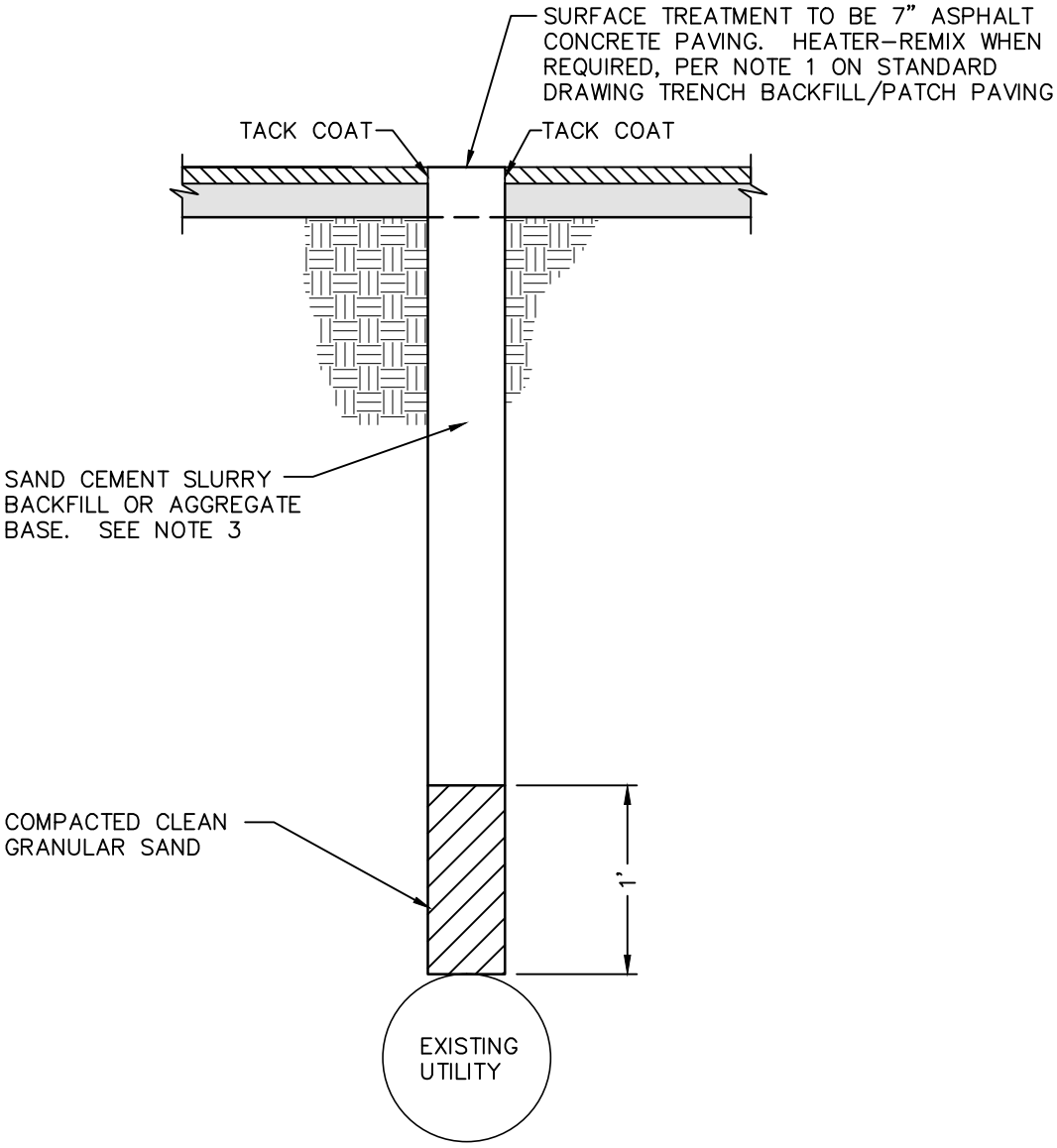
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TRENCH PLATE DETAILS

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NOTES:

1. THIS BACKFILL METHOD IS REQUIRED FOR UTILITY POTHOLES 9" DIAMETER OR LESS, OR MAXIMUM DIMENSION IN ANY DIRECTION OF 9" OR LESS, OR ANY POTHOLE DIRECTED BY THE ENGINEER TO BE BACKFILLED BY THIS METHOD.

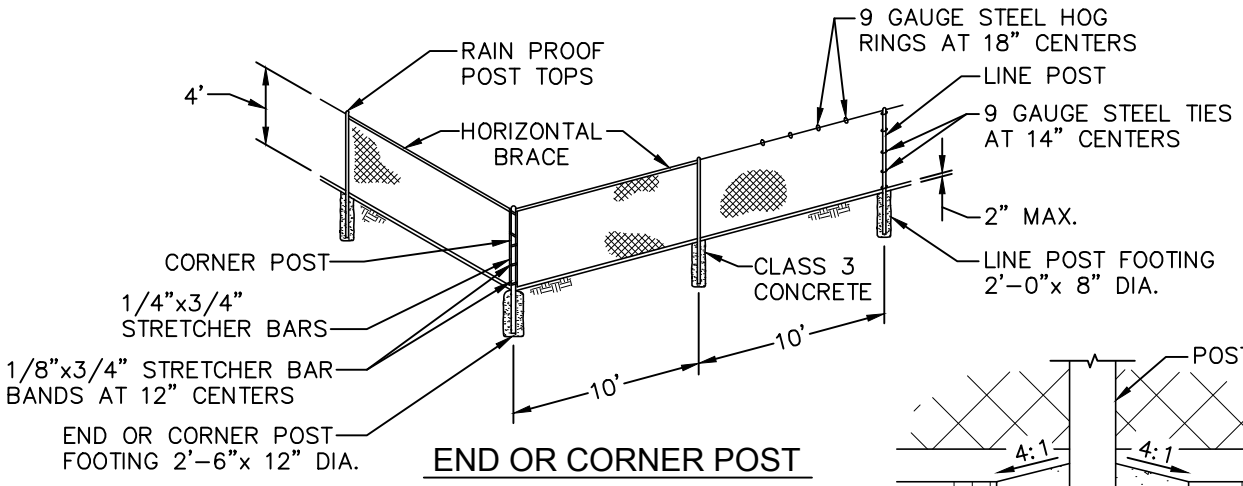
2. POTHOLES WITH DIMENSIONS GREATER THAN 9" SHALL BE BACKFILLED PER STANDARD DRAWING TRENCH BACKFILL/PATCH PAVING.

3. TWO SACK SAND CEMENT SLURRY BACKFILL OR CLASS 2 AGGREGATE BASE COMPACTED PER STANDARD DRAWING TRENCH BACKFILL/PATCH PAVING, SHALL CONFORM TO THE CITY OF VISALIA STANDARD SPECIFICATIONS.

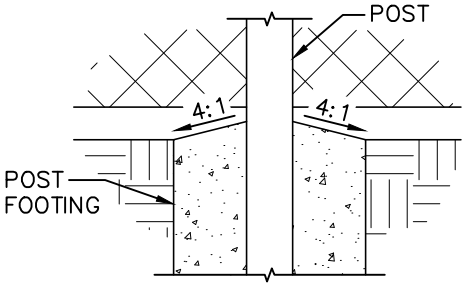
4. TEMPORARY TRENCH SURFACING SHALL CONSIST OF A MINIMUM OF 2" COLD MIX AND SHALL BE REQUIRED WHENEVER THE STREET IS TEMPORARILY OPENED TO TRAFFIC. ALL TEMPORARY MATERIAL SHALL BE COMPLETELY REMOVED PRIOR TO FINAL PAVING.

5. WHEN 3 OR MORE POTHOLES HAPPEN WITHIN 12 LINEAR FEET ON A SINGLE TRAVEL LANE, THE CONTRACTOR SHALL MILL AND REPLACE THE ASPHALT CONCRETE SECTION.

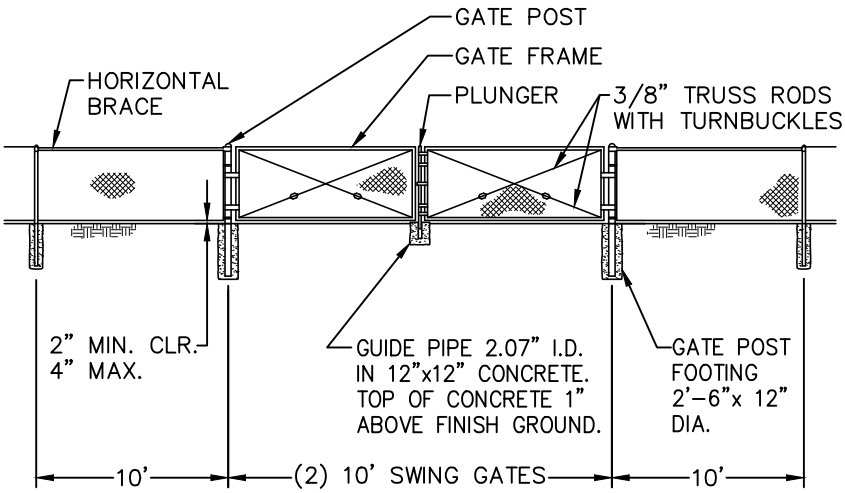
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
UTILITY POTHOLE BACKFILL	REVISIONS 06/14/13 BK 2016 — E-4



END OR CORNER POST



POST FOOTING DETAIL



GATE

POST AND BRACE SIZE REQUIREMENTS

DESCRIPTION	MIN. SIZE	MIN. WEIGHT LBS./FT.
END, LATCH OR CORNER POSTS	2.375"	3.65
LINE POSTS	1.900"	2.72
BRACES	1.660"	2.27
GATE POSTS	4.500"	10.80
GATE FRAMES	1.900"	2.72
GATE PLUNGER	1.600"	2.27

NOTES:

1. POSTS, BRACES AND GATE FRAMES SHALL BE COMMERCIAL QUALITY, OR BETTER, WELDABLE STEEL.
2. POST TOPS, STRETCHER BARS AND OTHER REQUIRED FITTINGS AND HARDWARE SHALL BE STEEL OR MALLEABLE IRON OR WROUGHT IRON.
3. CHAIN LINK FABRIC SHALL BE 9 GAUGE WIRE WOVEN INTO APPROXIMATELY 2" MESH. FABRIC SHALL HAVE A KNUCKLE BOTTOM AND TWISTED TOP.
4. LINE POSTS SHALL BE A MINIMUM OF 6'-0" LONG. GATE, END AND CORNER POSTS SHALL BE A MINIMUM OF 6'-6" LONG.
5. GATE FRAMES SHALL BE CROSSED TRUSSED WITH 3/8" ADJUSTABLE TRUSS RODS. THE CORNERS OF GATE FRAMES SHALL BE FASTENED TOGETHER WITH A MALLEABLE IRON FITTING OR WELDED AND GALVANIZE COATED OVER WELDS.
6. GATES SHALL BE HUNG BY AT LEAST TWO STEEL OR MALLEABLE IRON HINGES NOT LESS THAN THREE INCHES IN WIDTH AND SHALL HAVE A MALLEABLE CATCH AND LOCKING ATTACHMENT.
7. ALL CHAIN LINK FENCE MATERIAL SHALL BE GALVANIZED.
8. CHAIN LINK FENCING FOR SCREENING MAY BE REQUIRED BY THE CITY ENGINEER.
9. VINYL COATING MAY BE REQUIRED BY THE CITY ENGINEER.
10. NARROWER GATE SIZES SHALL BE SUBJECT TO APPROVAL BY THE CITY ENGINEER.

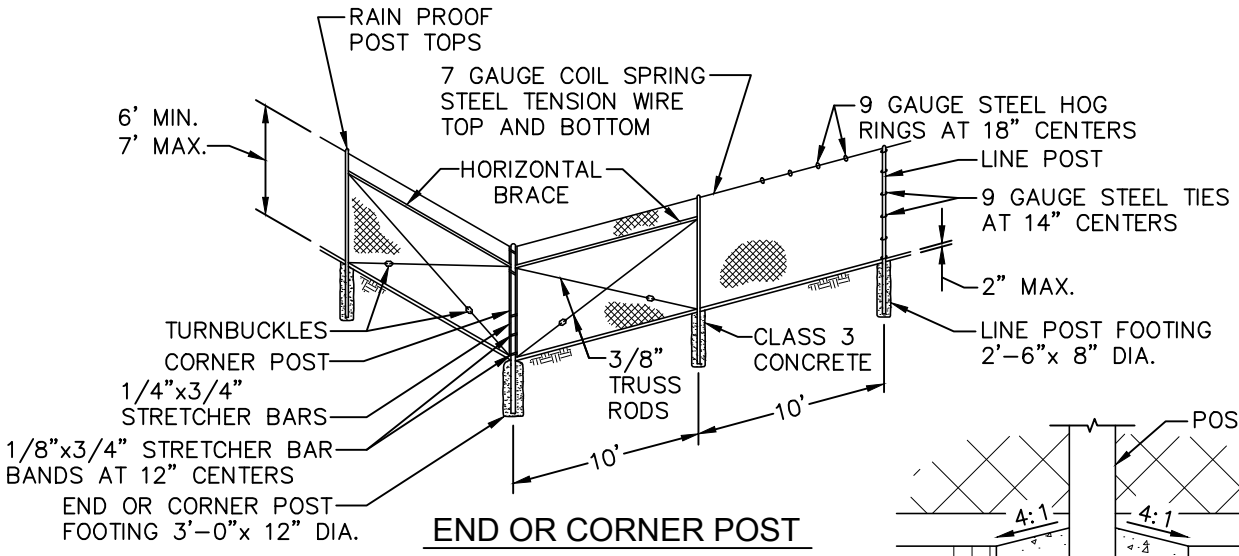
APPROVED BY: _____ 09/16/16
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

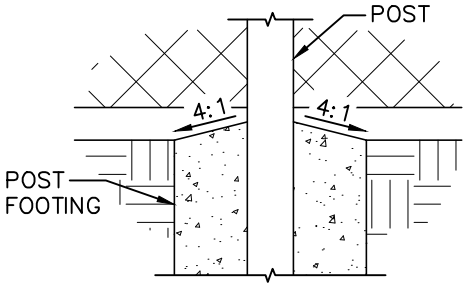
4 FOOT TALL CHAIN LINK FENCING

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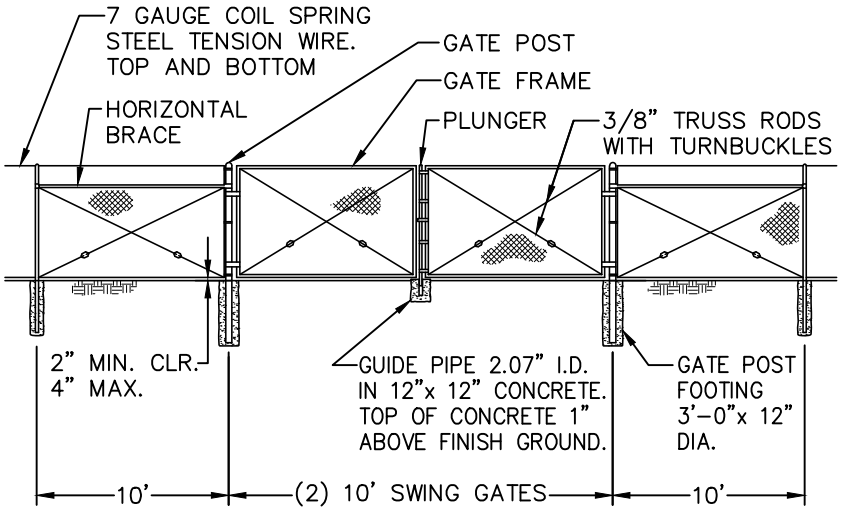
F-1



END OR CORNER POST



POST FOOTING DETAIL



GATE

POST AND BRACE SIZE REQUIREMENTS

DESCRIPTION	MIN. SIZE	MIN. WEIGHT LBS./FT.
END, LATCH OR CORNER POSTS	2.875"	5.80
LINE POSTS	2.375"	3.65
BRACES	1.660"	2.27
GATE POSTS	5.563"	14.63
GATE FRAMES	1.900"	2.72
GATE PLUNGER	1.600"	2.27

NOTES:

1. POSTS, BRACES AND GATE FRAMES SHALL BE COMMERCIAL QUALITY, OR BETTER, WELDABLE STEEL.
2. POST TOPS, STRETCHER BARS AND OTHER REQUIRED FITTINGS AND HARDWARE SHALL BE STEEL OR MALLEABLE IRON OR WROUGHT IRON.
3. CHAIN LINK FABRIC SHALL BE 9 GAUGE WIRE WOVEN INTO APPROXIMATELY 2" MESH. FABRIC SHALL HAVE A KNUCKLE BOTTOM AND TWISTED TOP.
4. FOR A 6' TALL FENCE, LINE POSTS SHALL BE A MINIMUM OF 8'-6" LONG. GATE, END AND CORNER POSTS SHALL BE A MINIMUM OF 9'-0" LONG.
5. END, CORNER, GATE AND LATCH POSTS SHALL BE BRACED TO THE NEAREST LINE POST WITH HORIZONTAL OR DIAGONAL BRACES USED AS COMPRESSION MEMBERS AND 3/8" STEEL TRUSS RODS WITH TURNBUCKLES USED AS TENSION MEMBERS.
6. GATE FRAMES SHALL BE CROSSED TRUSSED WITH 3/8" ADJUSTABLE TRUSS RODS. THE CORNERS OF GATE FRAMES SHALL BE FASTENED TOGETHER WITH A MALLEABLE IRON FITTING OR WELDED AND GALVANIZE COATED OVER WELDS.
7. GATES SHALL BE HUNG BY AT LEAST TWO STEEL OR MALLEABLE IRON HINGES NOT LESS THAN THREE INCHES IN WIDTH AND SHALL HAVE A MALLEABLE CATCH AND LOCKING ATTACHMENT.
8. ALL CHAIN LINK FENCE MATERIAL SHALL BE GALVANIZED.
9. CHAIN LINK FENCING FOR SCREENING MAY BE REQUIRED BY THE CITY ENGINEER.
10. VINYL COATING MAY BE REQUIRED BY THE CITY ENGINEER.
11. NARROWER GATE SIZES SHALL BE SUBJECT TO APPROVAL BY THE CITY ENGINEER.
12. 7' TALL FENCES MAY BE REQUIRED BY CITY ENGINEER. FOR A 7' TALL FENCE, LINE POSTS SHALL BE A MINIMUM OF 9'-6" LONG. GATE, END AND CORNER POSTS SHALL BE A MINIMUM OF 10'-0' LONG.

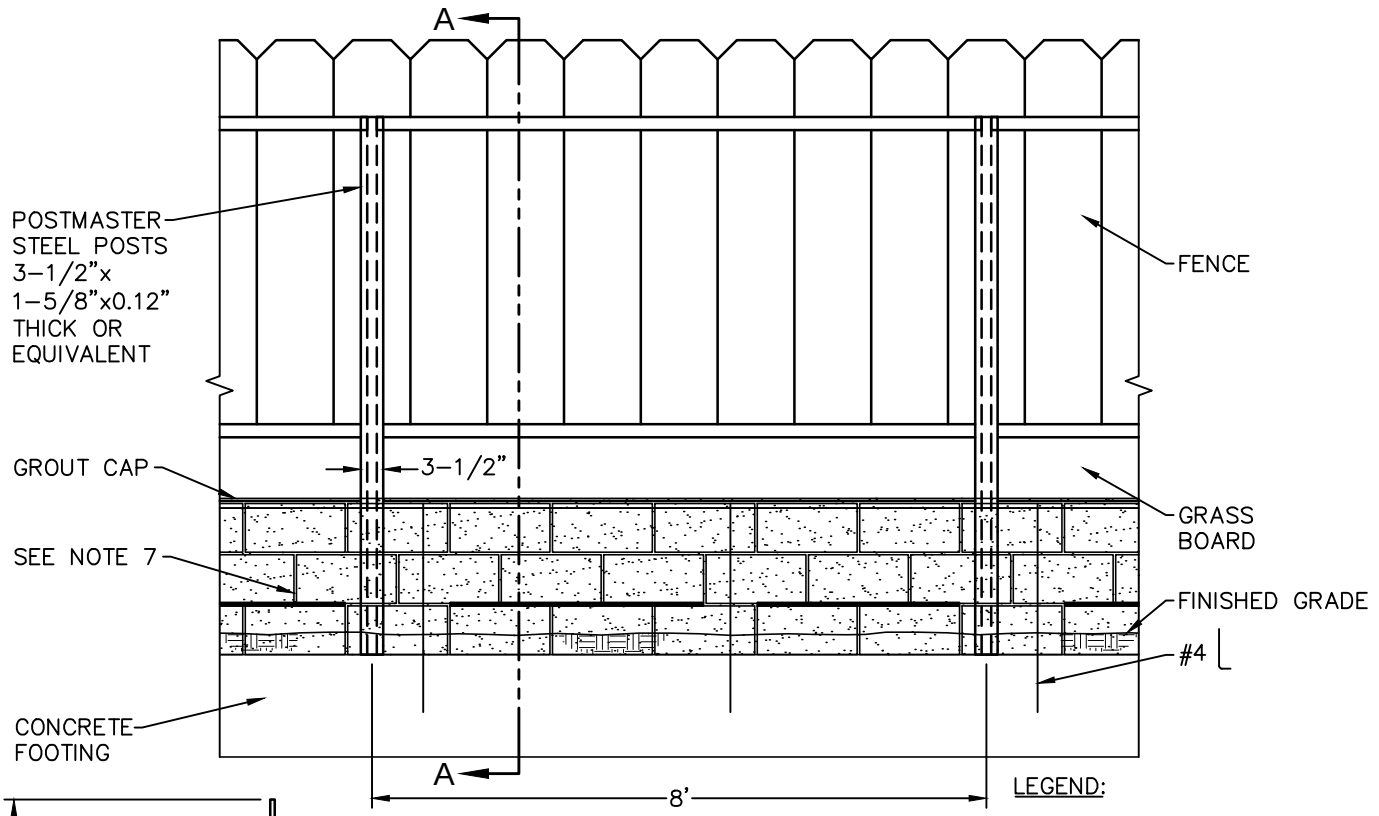
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

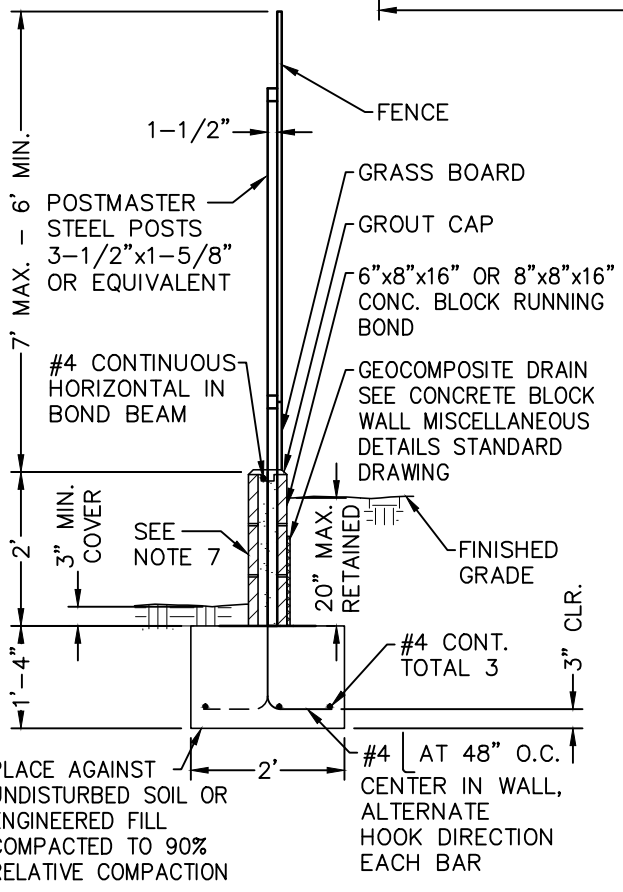
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

6 FOOT – 7 FOOT TALL CHAIN LINK FENCING

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SECTION A-A

LEGEND:

GROUT FILLED CELLS

NOTES:

1. ALL MASONRY SHALL COMPLY WITH THE CURRENT EDITION OF THE CALIFORNIA BUILDING CODE.
2. FOOTING CONCRETE SHALL BE CLASS 3, PRE–MIXED. 28–DAY COMPRESSIVE STRENGTH = 2500 psi MIN.
3. CONCRETE MASONRY UNITS SHALL COMPLY WITH ASTM C90.
4. MASONRY DESIGN IS BASED ON MINIMUM COMPRESSIVE STRENGTH OF f'_m = 1500 psi.
5. REINFORCING BARS SHALL BE ASTM A615 GRADE 40 DEFORMED STEEL AND SHALL BE CLEAN OF DIRT AND RUST BEFORE PLACEMENT.
6. MORTAR SHALL BE TYPE 'S' AND CONFORM TO ASTM C270.
7. OMIT MORTAR FROM VERTICAL JOINT IN FIRST COURSE ABOVE FINISHED GRADE AT 32" CENTERS FOR WEEP HOLES. FILL ALL CELLS WITH GROUT.
8. GROUT SHALL CONFORM TO THE REQUIREMENTS OF ASTM C476. ADMIXTURES FOR GROUT MUST BE APPROVED BY THE ENGINEER. FIELD ADDITION OF ADMIXTURES IS NOT PERMITTED IN SELF–CONSOLIDATING GROUT.
9. GROUT REINFORCED CELLS ONLY, UNLESS NOTED OTHERWISE.
10. WALL THICKNESS SHALL BE EITHER 6" OR 8", UNLESS NOTED OTHERWISE.
11. WALL SHALL BE CENTERED ON PROPERTY LINE WHEN LOCATED BACK TO BACK OF PRIVATE RESIDENTIAL LOTS. WALL SHOULD BE FULLY WITHIN PRIVATE PROPERTY WHEN USED ADJACENT TO R/W OR L&LD LOT.
12. CONTRACTOR SUBMITTALS SHALL CONFORM TO ARTICLE 1.5 OF TMS 602/ACI 530.1/ASCE 6
13. QUALITY ASSURANCE SHALL CONFORM TO LEVEL 'B' QUALITY ASSURANCE PER ARTICLE 1.6 OF TMS 602/ACI 530.1/ ASCE 6. PERIODIC SPECIAL INSPECTION REQUIRED.
14. PLACE EXPANSION JOINT IN CONCRETE BLOCK WALL AT 96'–0" O.C. MAX., SEE CONCRETE BLOCK WALL MISCELLANEOUS DETAILS STANDARD DRAWING.

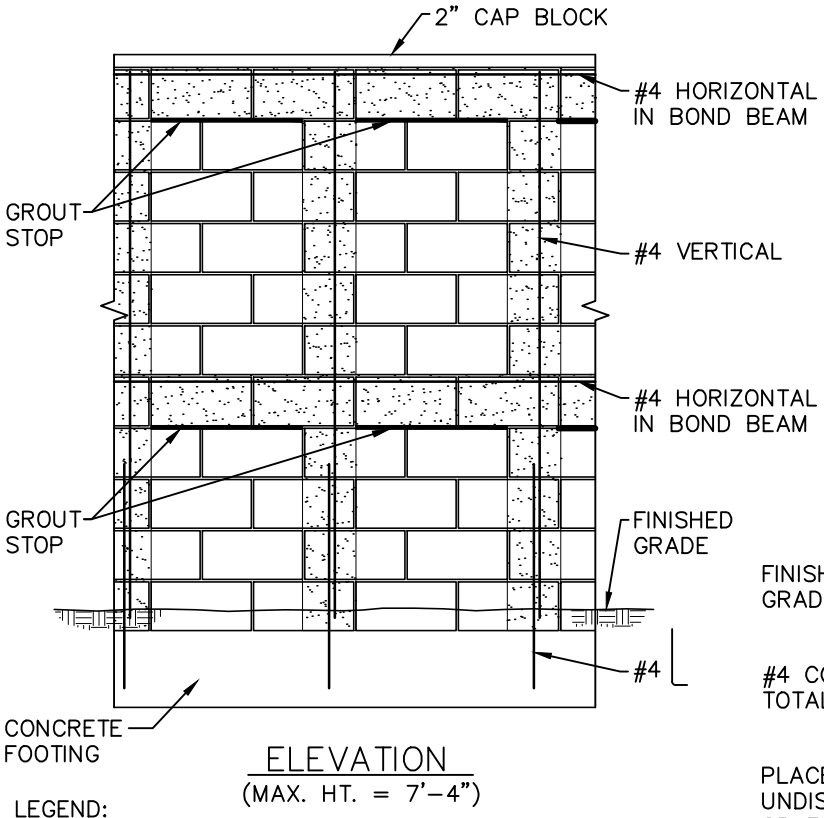
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

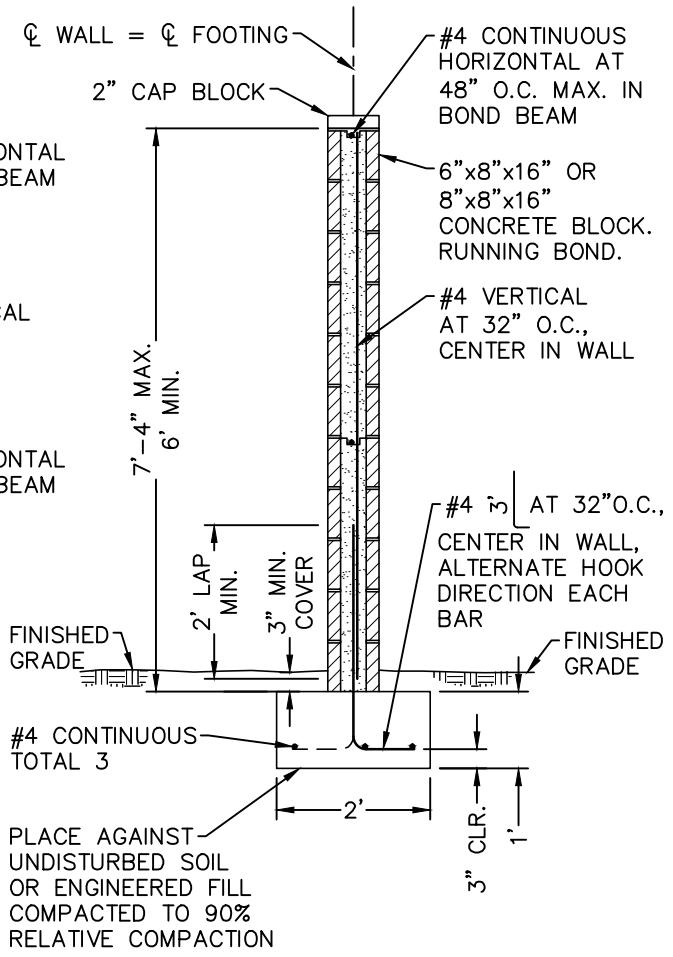
2 FOOT CONCRETE BLOCK WALL WITH WOOD FENCE

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F–3



ELEVATION
(MAX. HT. = 7'-4")



LEGEND:

GROUT FILLED CELLS

NOTES:

1. ALL MASONRY SHALL COMPLY WITH THE CURRENT EDITION OF THE CALIFORNIA BUILDING CODE.
2. FOOTING CONCRETE SHALL BE CLASS 3, PRE-MIXED. 28-DAY COMPRESSIVE STRENGTH = 2500 psi MIN.
3. CONCRETE MASONRY UNITS SHALL COMPLY WITH ASTM C90.
4. MASONRY DESIGN IS BASED ON MINIMUM COMPRESSIVE STRENGTH OF f'_m = 1500 psi.
5. REINFORCING BARS SHALL BE ASTM A615 GRADE 40 DEFORMED STEEL AND SHALL BE CLEAN OF DIRT AND RUST BEFORE PLACEMENT.
6. MORTAR SHALL BE TYPE 'S' AND CONFORM TO ASTM C270.
7. GROUT SHALL CONFORM TO THE REQUIREMENTS OF ASTM C476. ADMIXTURES FOR GROUT MUST BE APPROVED BY THE ENGINEER. FIELD ADDITION OF ADMIXTURES IS NOT PERMITTED IN SELF-CONSOLIDATING GROUT.
8. GROUT REINFORCED CELLS ONLY, UNLESS NOTED OTHERWISE.
9. GROUT STOP SHALL CONSIST OF METAL OR PLASTIC LATH APPROVED BY THE MANUFACTURER TO CREATE A BARRIER THAT STOPS THE FLOW OF GROUT WHEN FILLING BLOCK WALL CELLS.
10. WALL THICKNESS SHALL BE EITHER 6" OR 8", UNLESS NOTED OTHERWISE.
11. FINISHED GRADE ELEVATION DIFFERENCE ON OPPOSITE SIDES OF THE WALL SHALL BE 6" MAXIMUM.
12. BLOCK WALL SHALL HAVE PILASTERS OR A JOG IN PLAN EVERY 200 FT MIN. VENEERS OR OTHER ARCHITECTURAL FEATURES RECOMMENDED. LOAD ALLOWANCE FOR ARCHITECTURAL TREATMENT IS 90 plf.
13. CONTRACTOR SUBMITTALS SHALL CONFORM TO ARTICLE 1.5 OF TMS 602/ACI 530.1/ASCE 6
14. QUALITY ASSURANCE SHALL CONFORM TO LEVEL 'B' QUALITY ASSURANCE PER ARTICLE 1.6 OF TMS 602/ACI 530.1/ASCE 6. PERIODIC SPECIAL INSPECTION REQUIRED. CONTRACTOR SHALL CONTACT THE CITY FOR INSPECTIONS.
15. PLACE EXPANSION JOINT AT 96'-0" O.C. MAX., SEE CONCRETE BLOCK WALL MISCELLANEOUS DETAILS STANDARD DRAWING.
16. FOR ALTERNATE FOOTINGS, SEE CONCRETE BLOCK WALL ALTERNATE FOOTINGS STANDARD DRAWING.
17. INTERLOCKING BLOCKS ARE AN ACCEPTABLE ALTERNATIVE.
18. WHEN WALL IS BETWEEN PRIVATE PROPERTY AND L&LD LOT, THE WALL STEM SHALL BE FULLY WITHIN THE L&LD LOT WITH THE FACE OF THE WALL AT PROPERTY LINE. BLOCK WALL FOOTING EASEMENT WILL BE REQUIRED FOR PORTION OF FOOTING EXTENDING INTO PRIVATE PROPERTY.

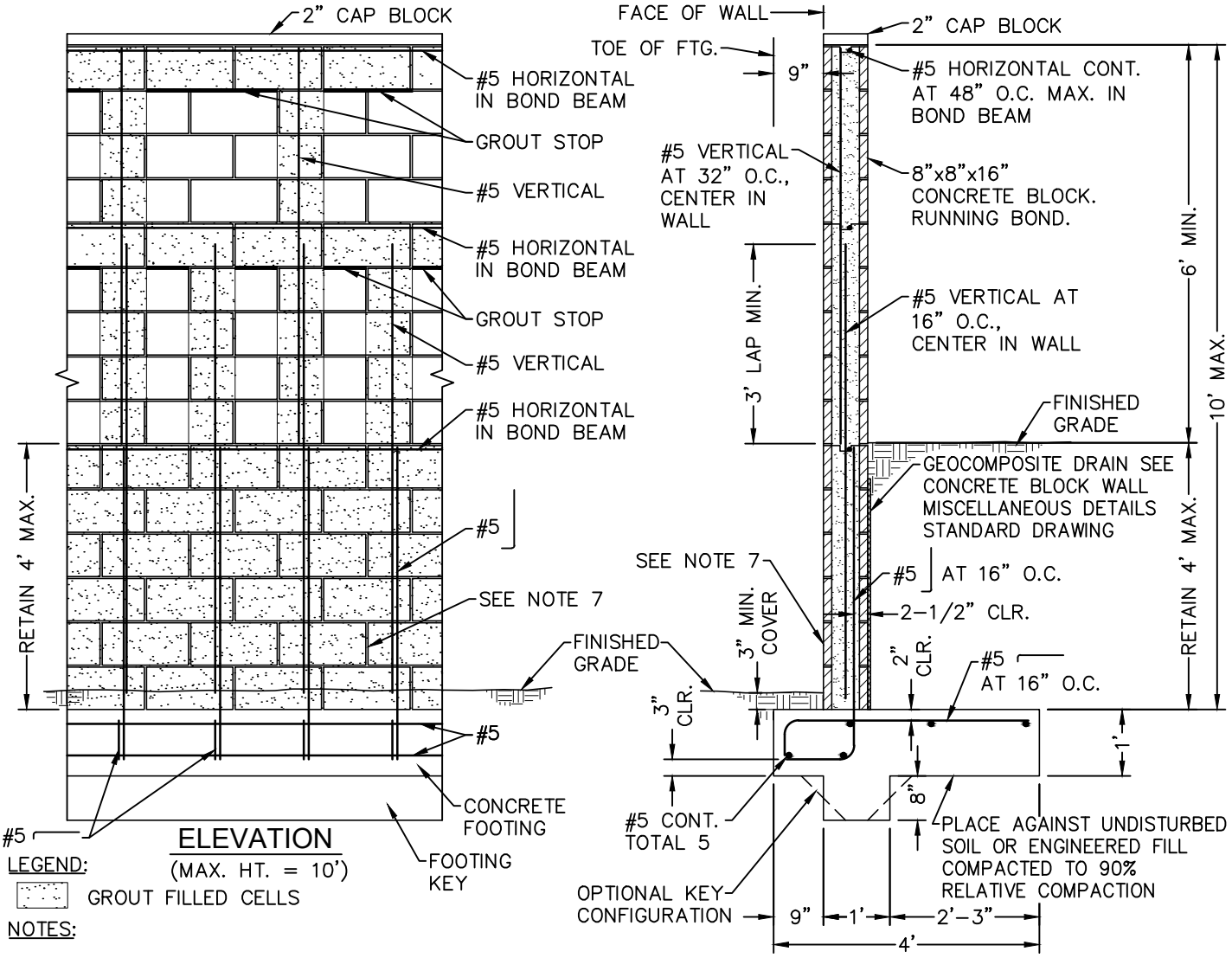
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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

CONCRETE BLOCK WALL DETAIL

REVISIONS
07/19/16
BK 2016

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NOTES:

1. ALL MASONRY SHALL COMPLY WITH THE CURRENT EDITION OF THE CALIFORNIA BUILDING CODE.
2. FOOTING CONCRETE SHALL BE CLASS 3, PRE-MIXED. 28-DAY COMPRESSIVE STRENGTH = 2500 psi MIN.
3. CONCRETE MASONRY UNITS SHALL COMPLY WITH ASTM C90.
4. MASONRY DESIGN IS BASED ON MINIMUM COMPRESSIVE STRENGTH OF f'_m = 1500 psi.
5. REINFORCING BARS SHALL BE ASTM A615 GRADE 40 DEFORMED STEEL AND SHALL BE CLEAN OF DIRT AND RUST BEFORE PLACEMENT.
6. MORTAR SHALL BE TYPE 'S' AND CONFORM TO ASTM C270.
7. OMIT MORTAR FROM VERTICAL JOINT IN FIRST COURSE ABOVE FINISHED GRADE AT 32" CENTERS FOR WEEP HOLES. FILL ALL CELLS WITH GROUT.
8. GROUT SHALL CONFORM TO THE REQUIREMENTS OF ASTM C476. ADMIXTURES FOR GROUT MUST BE APPROVED BY THE ENGINEER. FIELD ADDITION OF ADMIXTURES IS NOT PERMITTED IN SELF-CONSOLIDATING GROUT.
9. GROUT REINFORCED CELLS ONLY, UNLESS NOTED OTHERWISE.
10. GROUT STOP SHALL CONSIST OF METAL OR PLASTIC LATH APPROVED BY THE MANUFACTURER TO CREATE A BARRIER THAT STOPS THE FLOW OF GROUT WHEN FILLING BLOCK WALL CELLS.
11. BLOCK WALL SHALL HAVE PILASTERS OR A JOG IN PLAN EVERY 200 FT MIN. VENEERS OR OTHER ARCHITECTURAL FEATURES RECOMMENDED. LOAD ALLOWANCE FOR ARCHITECTURAL TREATMENT IS 90 plf.
12. CONTRACTOR SUBMITTALS SHALL CONFORM TO ARTICLE 1.5 OF TMS 602/ACI 530.1/ASCE 6
13. QUALITY ASSURANCE SHALL CONFORM TO LEVEL 'B' QUALITY ASSURANCE PER ARTICLE 1.6 OF TMS 602/ACI 530.1/ASCE 6. PERIODIC SPECIAL INSPECTION REQUIRED. CONTRACTOR SHALL CONTACT THE CITY FOR INSPECTIONS.
14. PLACE EXPANSION JOINT AT 96'-0"O.C. MAX., SEE CONCRETE BLOCK WALL MISCELLANEOUS DETAILS STANDARD DRAWING.
15. INTERLOCKING BLOCKS ARE AN ACCEPTABLE ALTERNATIVE.
16. WHEN WALL IS BETWEEN PRIVATE PROPERTY AND L&LD LOT, THE WALL STEM SHALL BE FULLY WITHIN THE L&LD LOT WITH THE FACE OF THE WALL AT PROPERTY LINE. BLOCK WALL FOOTING EASEMENT WILL BE REQUIRED FOR PORTION OF FOOTING EXTENDING INTO PRIVATE PROPERTY.

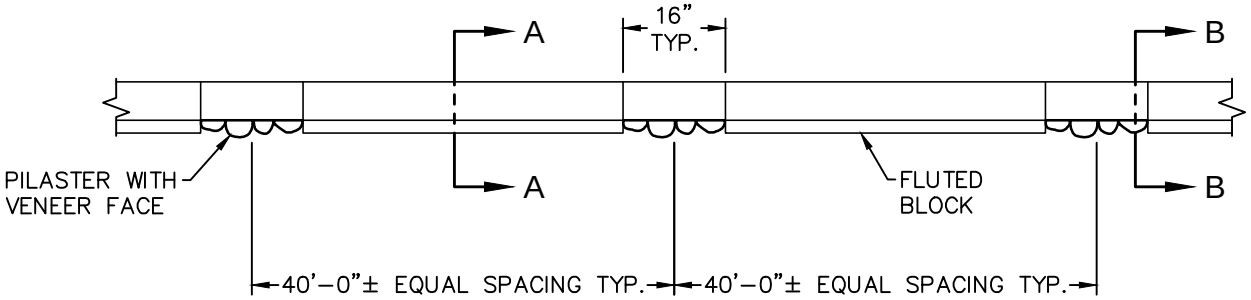
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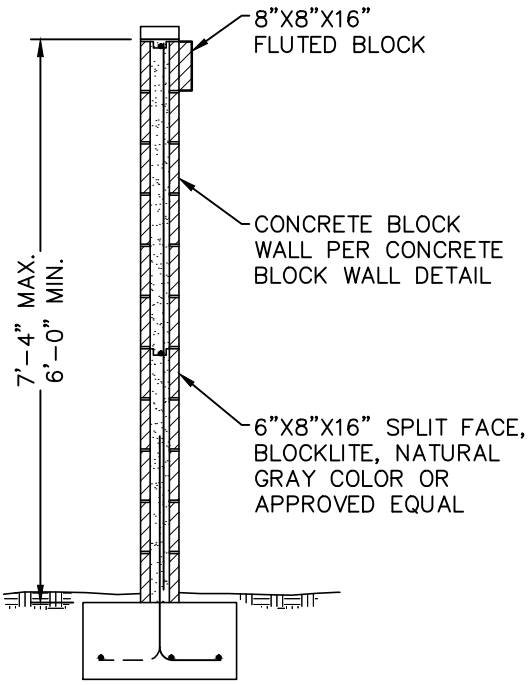
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

CONCRETE BLOCK RETAINING WALL DETAIL

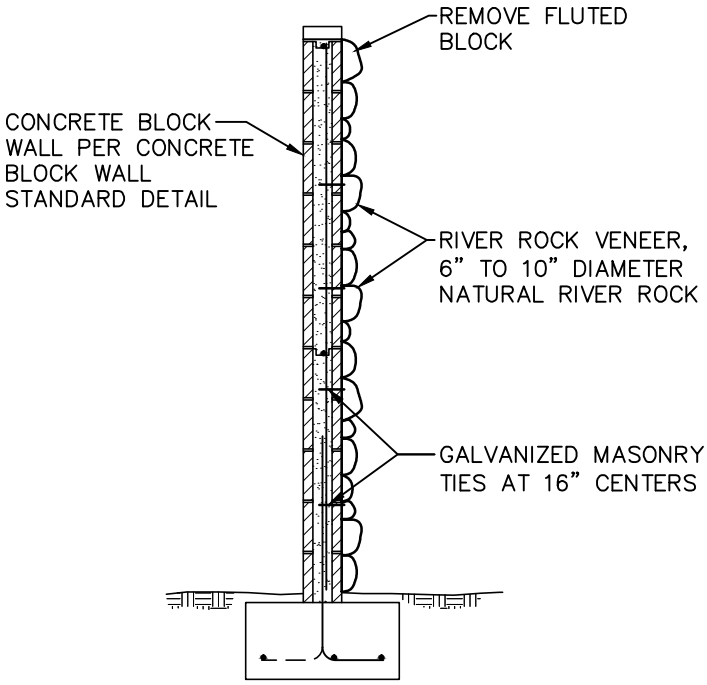
REVISIONS
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SECTION A-A

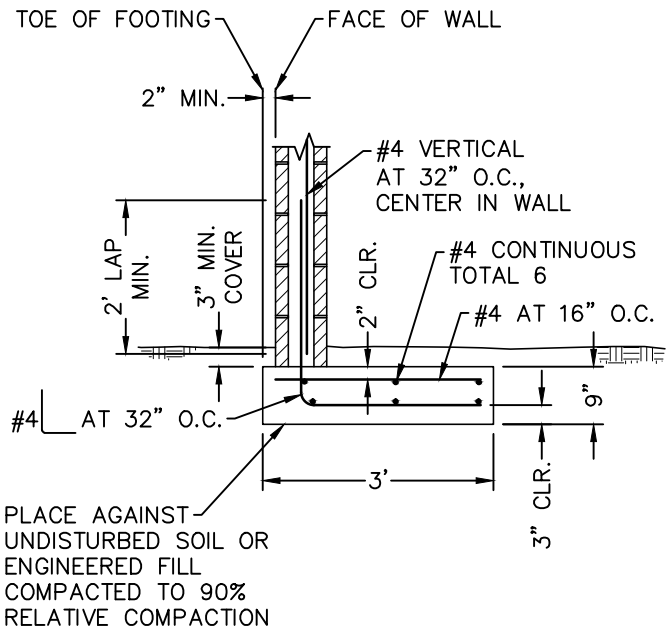


SECTION B-B

NOTES:

1. CONSTRUCTION REQUIREMENTS PER CONCRETE BLOCK WALL DETAIL SHOWN ON CONCRETE BLOCK WALL DETAIL STANDARD DRAWING.
2. FLUTED BLOCK AND RIVER ROCK VENEER ALSO COULD BE PLACED ON CONCRETE BLOCK RETAINING WALL DETAIL SHOWN ON CONCRETE BLOCK RETAINING WALL DETAIL STANDARD DRAWING. SEE CONCRETE BLOCK RETAINING WALL DETAIL STANDARD DRAWING FOR CONCRETE BLOCK RETAINING WALL FOOTING AND DIMENSION REQUIREMENTS.
3. UNIFORM HEIGHTS REQUIRED AT CURB RETURNS AND PEDESTRIAN ACCESS POINTS.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
NORTHEAST AREA SPECIFIC PLAN CONCRETE BLOCK WALL	REVISIONS 08/01/16 BK 2016
	F–6



WALL SECTION

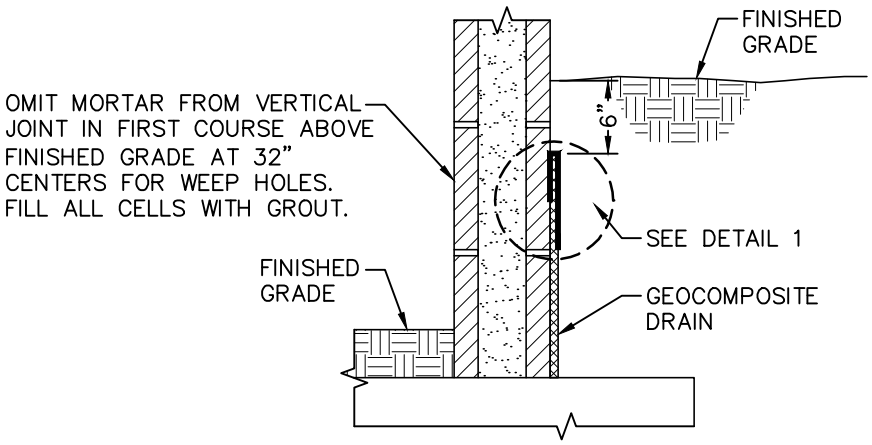
ALTERNATE FOOTING 'A'

(NON–RETAINING)
FOR USE UNDER OAK TREE

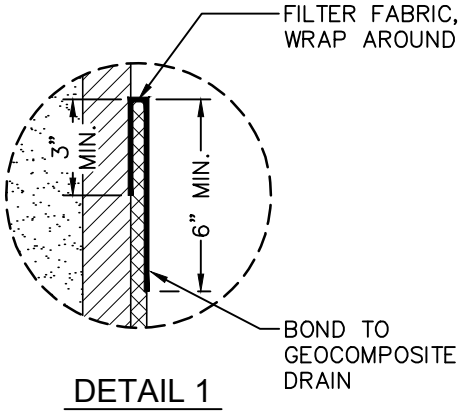
NOTES:

1. CONSTRUCTION REQUIREMENTS FOR CONCRETE BLOCK WALL SHOWN ON DETAIL CONCRETE BLOCK WALL DETAIL STANDARD DRAWING.
2. FOOTING CONCRETE SHALL BE CLASS 3, PRE–MIXED. 28–DAY COMPRESSIVE STRENGTH = 2500 psi MIN.
3. REINFORCING BARS SHALL BE ASTM A615 GRADE 40 DEFORMED STEEL AND SHALL BE CLEAN OF DIRT AND RUST BEFORE PLACEMENT.
4. FINISHED GRADE ELEVATION DIFFERENCE ON OPPOSITE SIDES OF THE WALL SHALL BE 6" MAXIMUM.
5. ALTERNATE FOOTINGS MAY BE USED UPON ACCEPTANCE FROM THE CITY ENGINEER. ENGINEER TO PROVIDE FOOTING DESIGN CALCULATIONS TO CONFIRM ALTERNATE FOOTING CAN BE USED IN PLACE OF THE STANDARD FOOTING SHOWN ON CONCRETE BLOCK WALL DETAIL STANDARD DRAWING.
6. ALTERNATE FOOTING 'A' IS A SHALLOW FOOTING DETAIL FOR USE UNDER OAK TREE CANOPY. TRENCHING BY HAND IS REQUIRED WHEN USED WITHIN DRIP LINE OF AN OAK TREE.

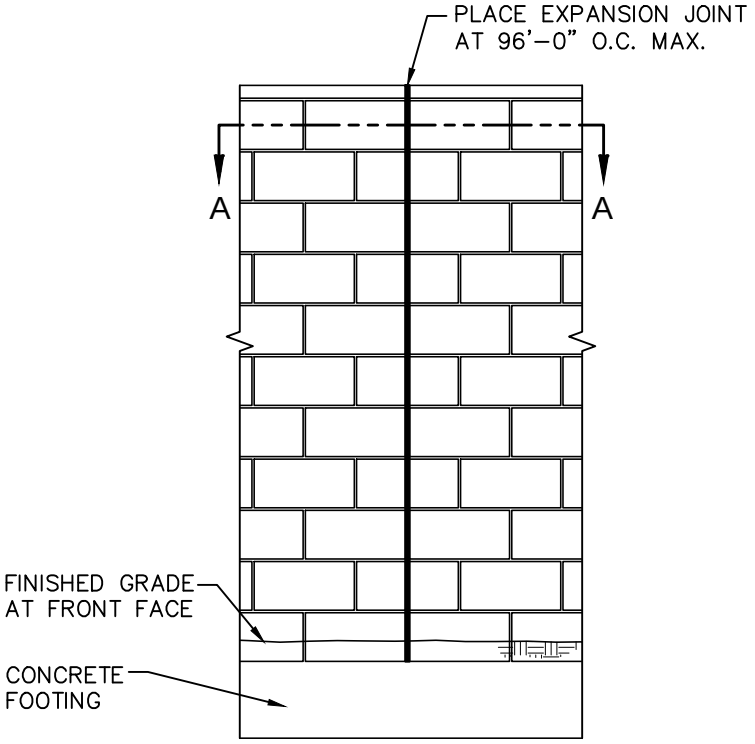
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
CONCRETE BLOCK WALL ALTERNATE FOOTINGS	REVISIONS 08/02/16 BK 2016
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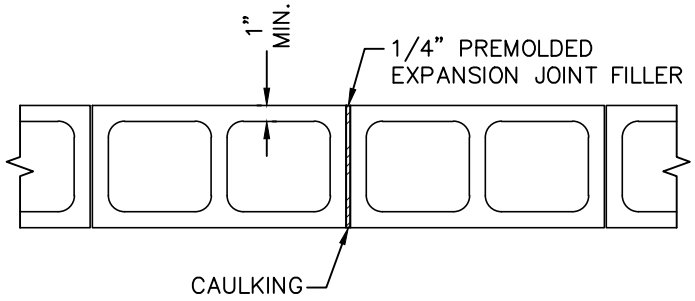
GEOCOMPOSITE DRAIN DETAIL



DETAIL 1



EXPANSION JOINT ELEVATION



SECTION A-A

NOTES:

1. GEOCOMPOSITE DRAIN MUST CONSIST OF A POLYMERIC CORE WITH FILTER FABRIC INTEGRALLY BONDED TO ONE OR BOTH SIDES OF THE CORE CREATING A STABLE DRAINAGE VOID AND MUST BE BETWEEN 1/4 AND 2 INCHES THICK. WHEN TESTED UNDER ASTM D 4716 WITH A GRADIENT OF 1.0 AND NORMAL STRESS OF 5,000 PSF, THE TRANSMISSIVITY MUST BE 4 GAL/MIN/FT.

2. FILTER FABRIC MUST BE MANUFACTURED FROM POLYESTER, POLYPROPYLENE, OR COMBINED POLYESTER AND POLYPROPYLENE. WHEN TESTED UNDER ASTM D 4491, THE PERMITTIVITY MUST BE AT LEAST 0.5 SEC^{-1}. WHEN TESTED UNDER ASTM D 4751, THE AVERAGE APPARENT OPENING SIZE MUST BE A MAXIMUM OF US STANDARD NO. 40 SIEVE. WHEN TESTED UNDER ASTM D 6241, THE PUNCTURE STRENGTH MUST BE AT LEAST 310 LB. WHEN TESTED UNDER ASTM D 4533, THE TRAPEZOID TEARING STRENGTH MUST BE AT LEAST 56 LB.

3. INSTALL GEOCOMPOSITE DRAIN WITH FILTER FABRIC FACING THE DIRT SIDE.

4. FABRIC FACING THE DIRT SIDE MUST OVERLAP AT LEAST 3 INCHES AT ALL JOINTS AND WRAP AROUND THE EXTERIOR EDGES AT LEAST 3 INCHES BEYOND THE EXTERIOR EDGE.

5. IF ADDITIONAL FABRIC IS NEEDED TO PROVIDE OVERLAP AT JOINTS AND WRAPAROUND AT EDGES, THE ADDED FABRIC MUST OVERLAP AT LEAST 6 INCHES AND BE ATTACHED TO THE FABRIC ON THE GEOCOMPOSITE DRAIN.

6. IF THE FABRIC ON THE GEOCOMPOSITE DRAIN IS TORN OR PUNCTURED, REPLACE THE DAMAGED SECTION COMPLETELY OR REPAIR IT BY PLACING A PIECE OF FABRIC THAT IS LARGE ENOUGH TO COVER THE DAMAGED AREA AND PROVIDE AT LEAST A 6–INCH OVERLAP.

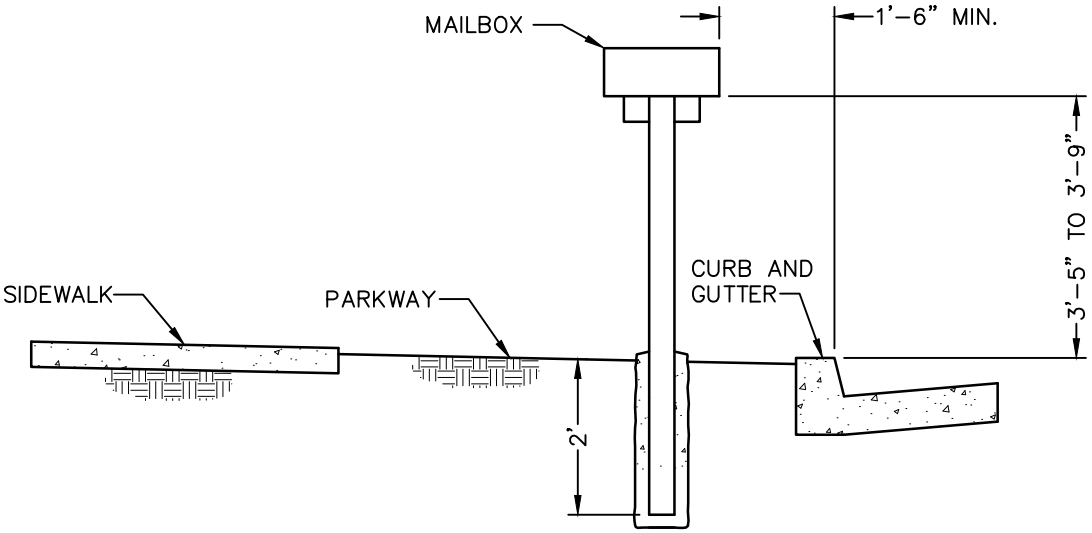
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

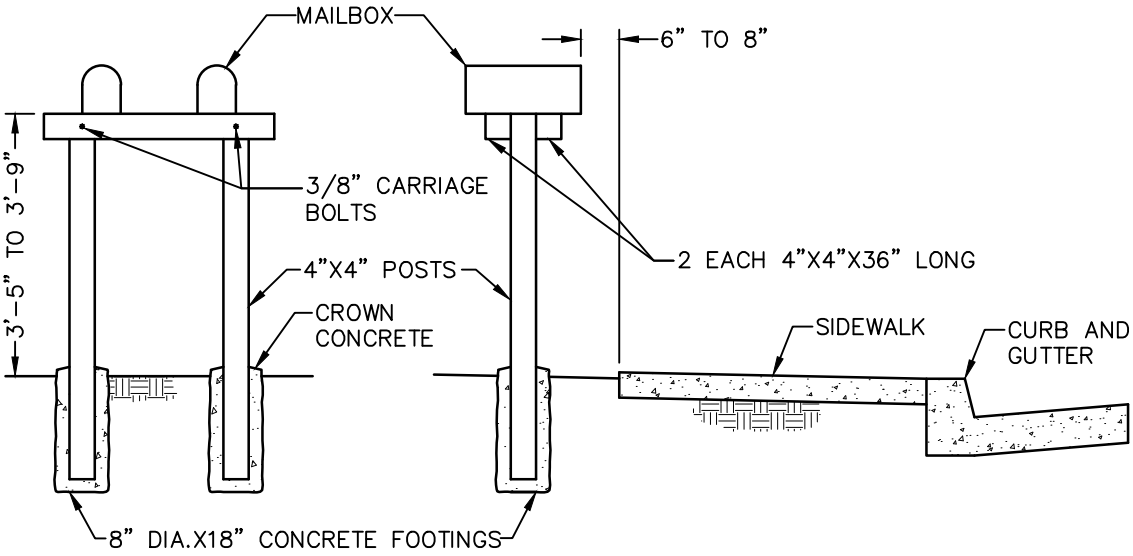
CONCRETE BLOCK WALL MISCELLANEOUS DETAILS

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LOCATION WITH PARKWAY



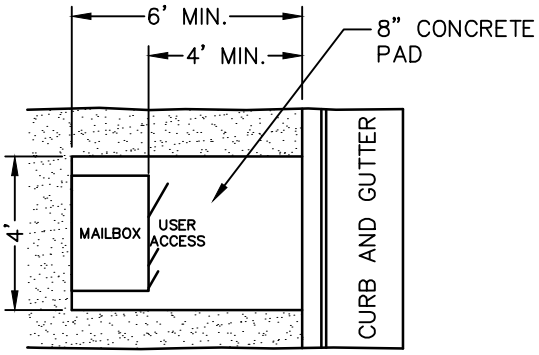
FRONT VIEW SIDE VIEW

LOCATION WITH ADJACENT SIDEWALK

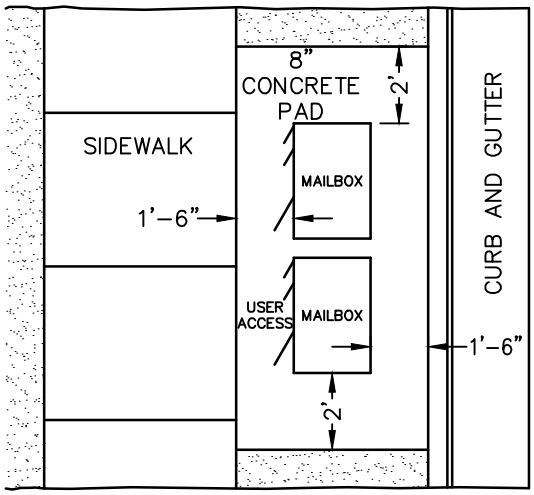
NOTES:

1. MAILBOXES SHALL BE IN COLLECTIONS OF 2 MINIMUM TO 3 MAXIMUM.
2. MAILBOXES SHALL SERVE HOUSES ON ONE SIDE OF STREET ONLY.
3. HOMEOWNERS SHALL BE RESPONSIBLE FOR ALL MAINTENANCE AND REPAIR.
4. VERTICAL STACKING OF MAILBOXES IS NOT PERMITTED
5. ALL WOOD POSTS SHALL BE NO. 2 PRESSURE TREATED DOUGLAS FIR OR REDWOOD.

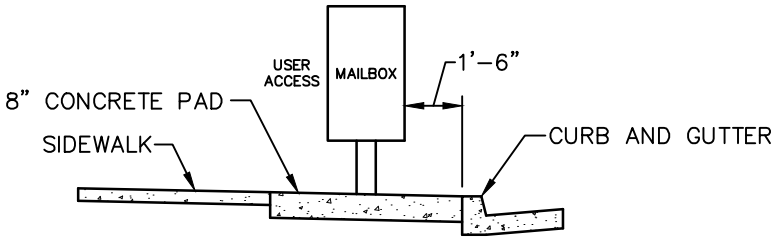
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
MAILBOX (INFILL & REPLACEMENT ONLY)	REVISIONS 08/03/16 BK 2016 — M-1



PLAN - SIDEWALK ADJACENT TO CURB (FRONT LOADING)



PLAN - WITH SIDEWALK



SECTION - WITH SIDEWALK

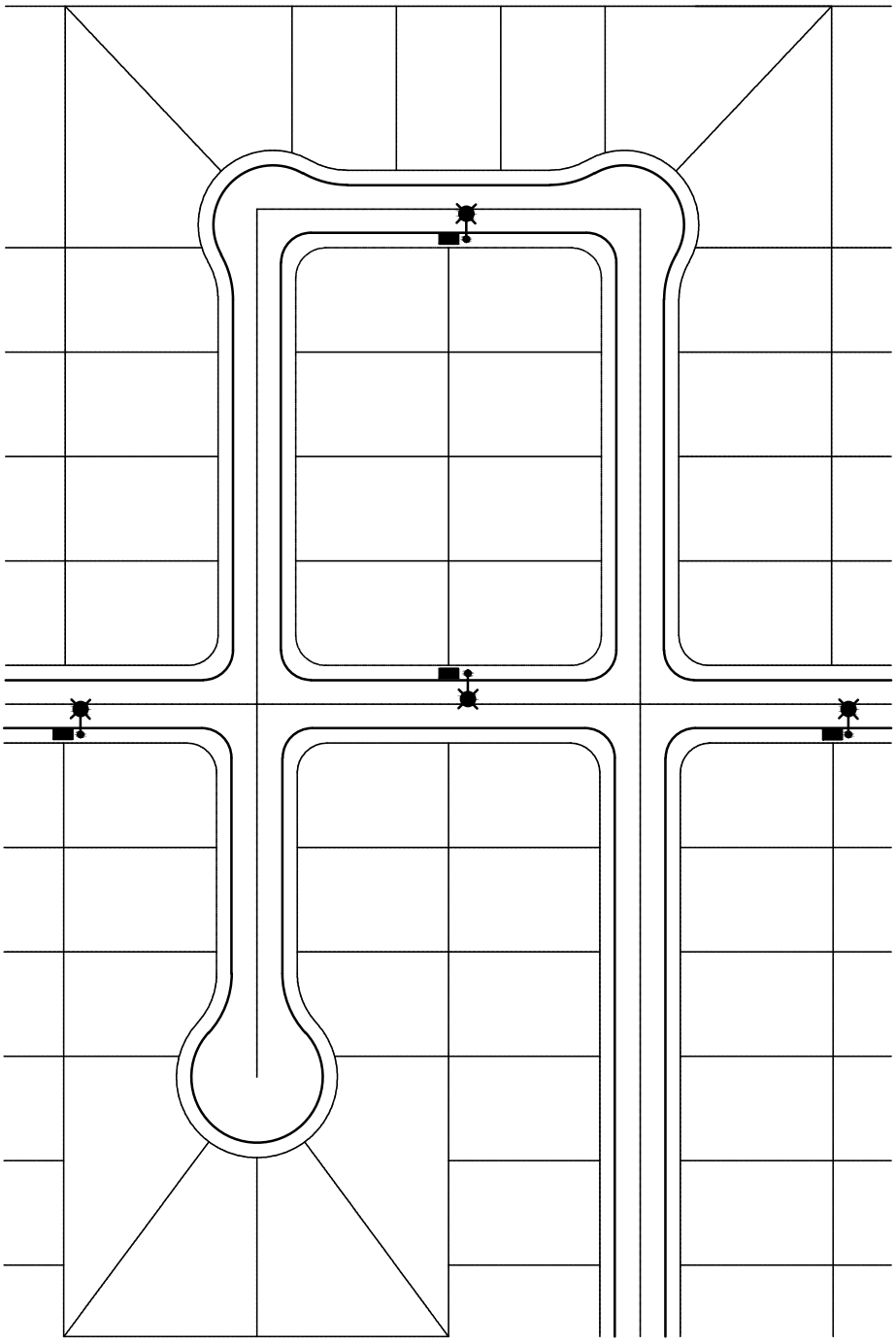
NOTES:

1. ALL MAILBOX CLUSTER DESIGNS SHALL BE APPROVED BY THE UNITED STATES POSTAL SERVICE PRIOR TO INSTALLATION.

2. CONCRETE PAD SHALL BE CONSTRUCTED PER UNITED STATES POSTAL SERVICE SPECIFICATIONS FOR SINGLE UNIT AND MULTIPLE UNITS.

3. MAILBOX CLUSTER SHALL BE ACCESSIBLE PER ADA REQUIREMENTS.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
MAILBOX CLUSTER	REVISIONS 08/03/16 BK 2016 — M-2



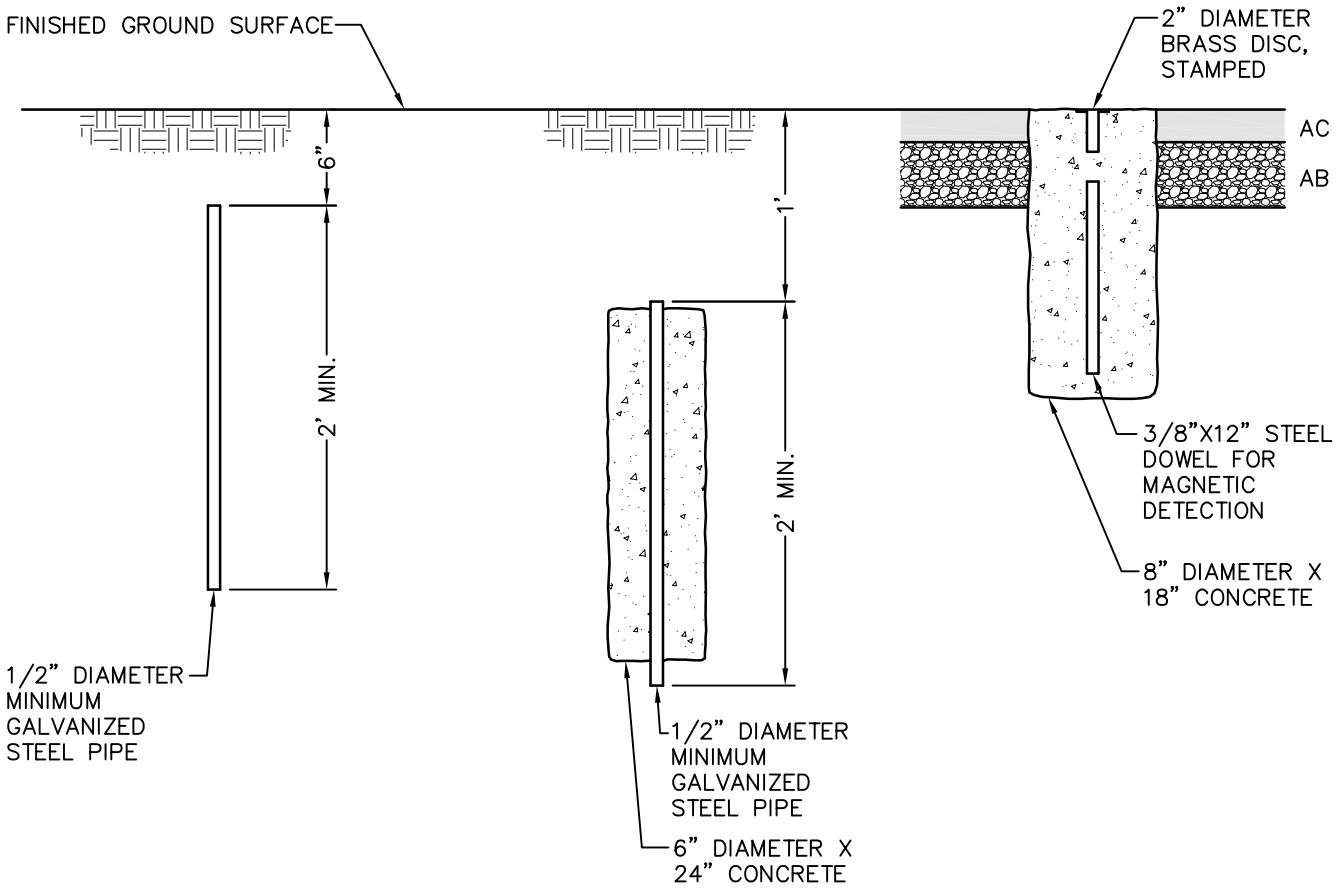
■ TYPICAL MAILBOX CLUSTER LOCATION

NOTES:

1. MAILBOX CLUSTER LOCATIONS SHALL HAVE A STREET LIGHT LOCATED WITHIN TEN FEET OF THE CLUSTER CONCRETE PAD. ALTERNATE LIGHTING MAY BE SUPPLIED (I.E. SOLAR) WITH CITY ENGINEER APPROVAL.

2. ALL MAILBOX CLUSTER LOCATIONS SHALL BE APPROVED BY THE UNITED STATES POSTAL SERVICE.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
TYPICAL MAILBOX CLUSTER LOCATIONS	REVISIONS 04/29/16 BK 2016 — M–3



TYPE "A"
LOT CORNERS

TYPE "B"
STREET MONUMENTS AND LANDSCAPED MEDIAN MONUMENTS

TYPE "C"
STREET MONUMENTS

NOTES:

1. ALL MONUMENTS SET SHALL BE PERMANENTLY AND VISIBLY MARKED OR TAGGED WITH THE LICENSE NUMBER OF THE SURVEYOR OR CIVIL ENGINEER SETTING IT.
2. ALL LOT CORNERS SHALL BE LOCATED WITH TYPE "A" MONUMENTS OR MONUMENTS APPROVED BY THE CITY SURVEYOR.
3. TYPE "C" STREET MONUMENTS SHALL BE USED TO LOCATE ALL ANGLE AND CURVE POINTS ON THE CENTERLINES OF ASPHALT CONCRETE SURFACED STREETS.
4. ADDITIONAL MONUMENTS MAY BE REQUIRED AT THE DISCRETION OF THE CITY SURVEYOR.

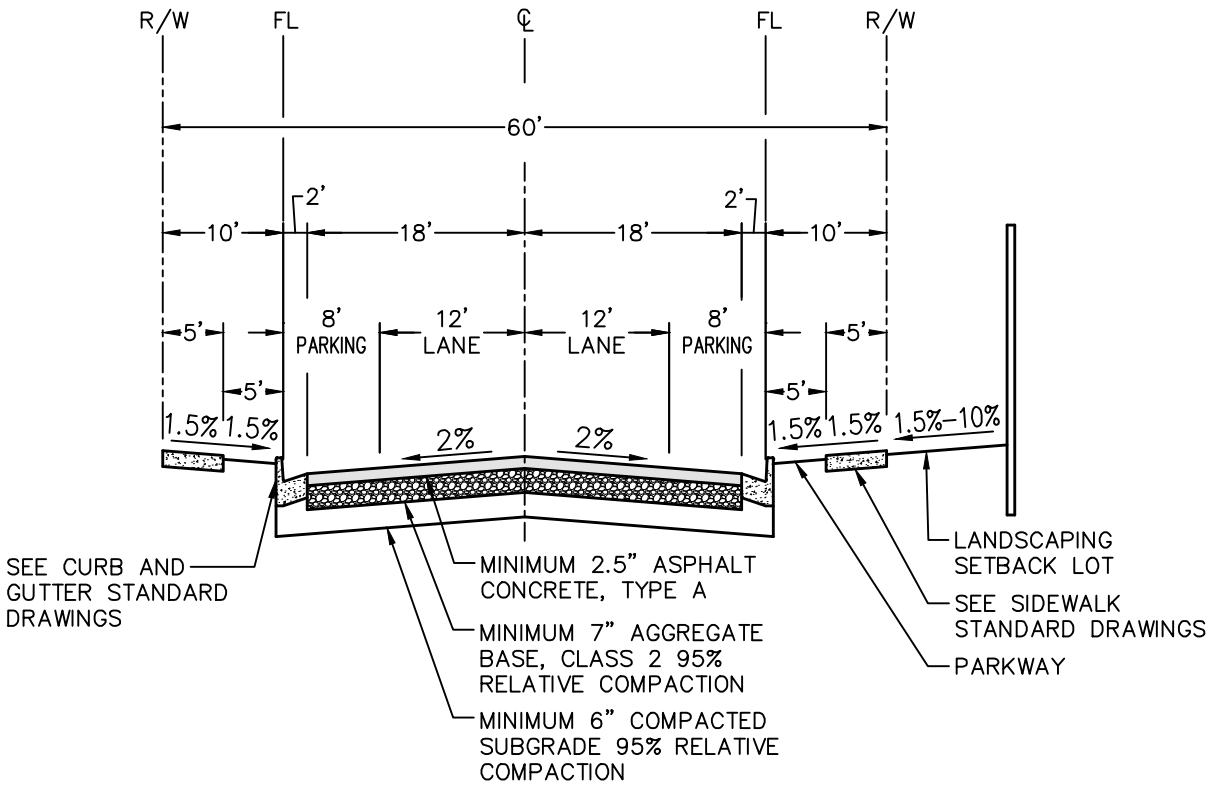
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

SURVEY MONUMENTS

REVISIONS
08/03/16
BK 2016

MN–1



NOTES:

1. DESIGN CRITERION: TRAFFIC INDEX SHALL BE 5.5.
2. STRUCTURAL SECTIONS SHALL BE DETERMINED BASED ON T.I. AND R–VALUES AS TABULATED IN THE STREET SECTIONS REQUIREMENTS STANDARD DRAWING.
3. ASPHALT CONCRETE SHALL BE TYPE A, WITH 3/4" AGGREGATE GRADATION AND LIQUID ASPHALT BINDER PER CITY OF VISALIA STANDARD SPECIFICATIONS.
4. TACK COAT IS REQUIRED AND SHALL BE APPLIED PER CITY STANDARD SPECIFICATIONS.
5. ASPHALT CONCRETE REQUIREMENTS SHALL BE AS STATED IN THE CITY OF VISALIA STANDARD SPECIFICATIONS.
6. ASPHALT CONCRETE SHALL BE PLACED ONLY WHEN THE ATMOSPHERIC TEMPERATURE IS 50° F AND RISING.
7. WITH ADDITIONAL LANDSCAPE EASEMENTS, SIDEWALK MAY BE LOCATED OUTSIDE RIGHT OF WAY TO PROVIDE ADDITIONAL PARKWAY.
8. A FOOTING EASEMENT WILL BE REQUIRED AS NEEDED FOR BLOCK WALL FOOTINGS THAT EXTEND INTO PRIVATE PROPERTY.
9. STREET TREES ARE REQUIRED IN ADDITION TO THE ON–SITE LANDSCAPE REQUIREMENT.
10. FOR PARTIAL WIDTH STREETS A MINIMUM OF 30 FT OF PAVEMENT AND 8 FT SHOULDERS ARE REQUIRED.
11. SOIL ADJACENT TO CONCRETE CURB AND SIDEWALK SHALL BE GRADED 3" BELOW TOP OF CURB TO ALLOW ROOM FOR MULCH.

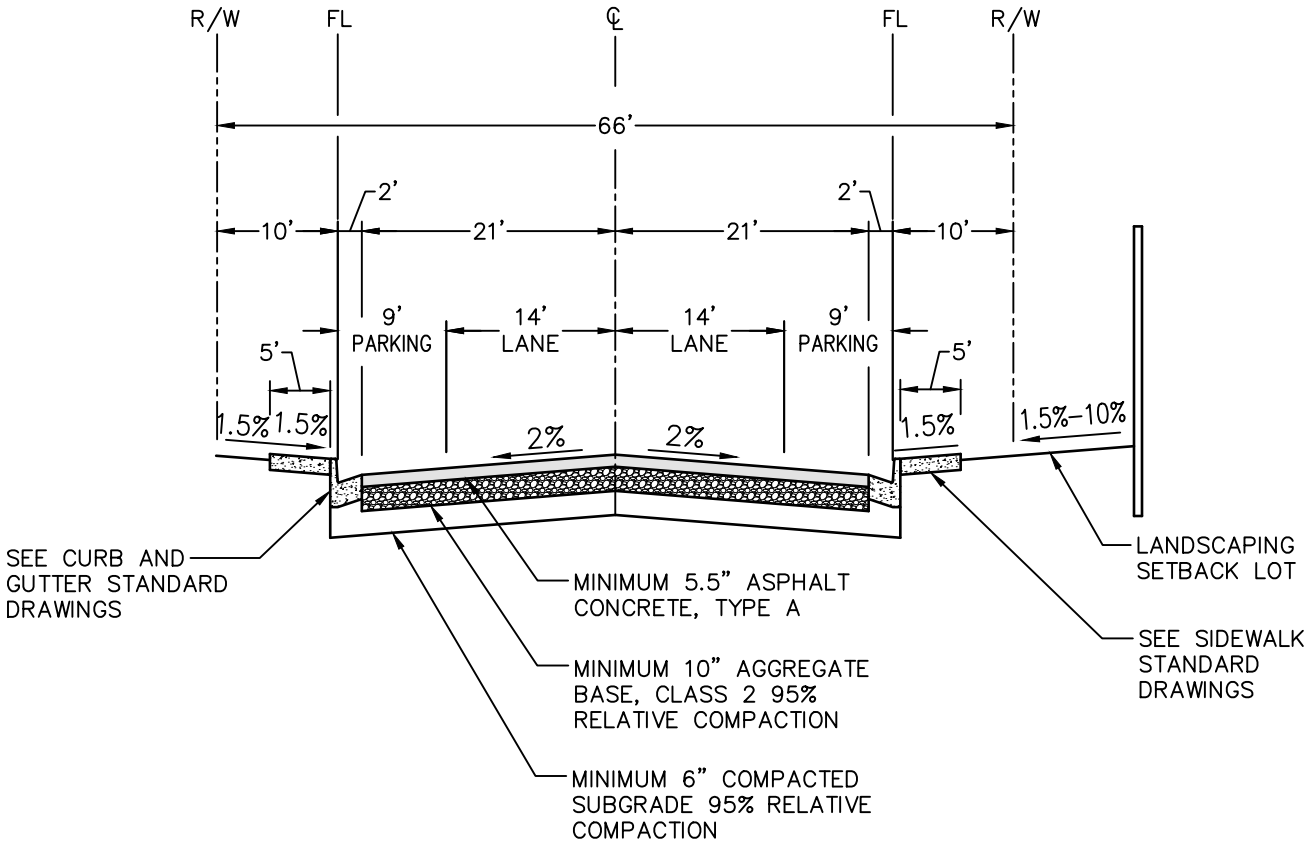
APPROVED BY: _____ 01/17/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

2 LANE LOCAL – RESIDENTIAL

REVISIONS
01/17/25
BK 2016

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NOTES:

1. DESIGN CRITERION: TRAFFIC INDEX SHALL BE 9.
2. STRUCTURAL SECTIONS SHALL BE DETERMINED BASED ON T.I. AND R–VALUES AS TABULATED IN THE STREET SECTIONS REQUIREMENTS STANDARD DRAWING.
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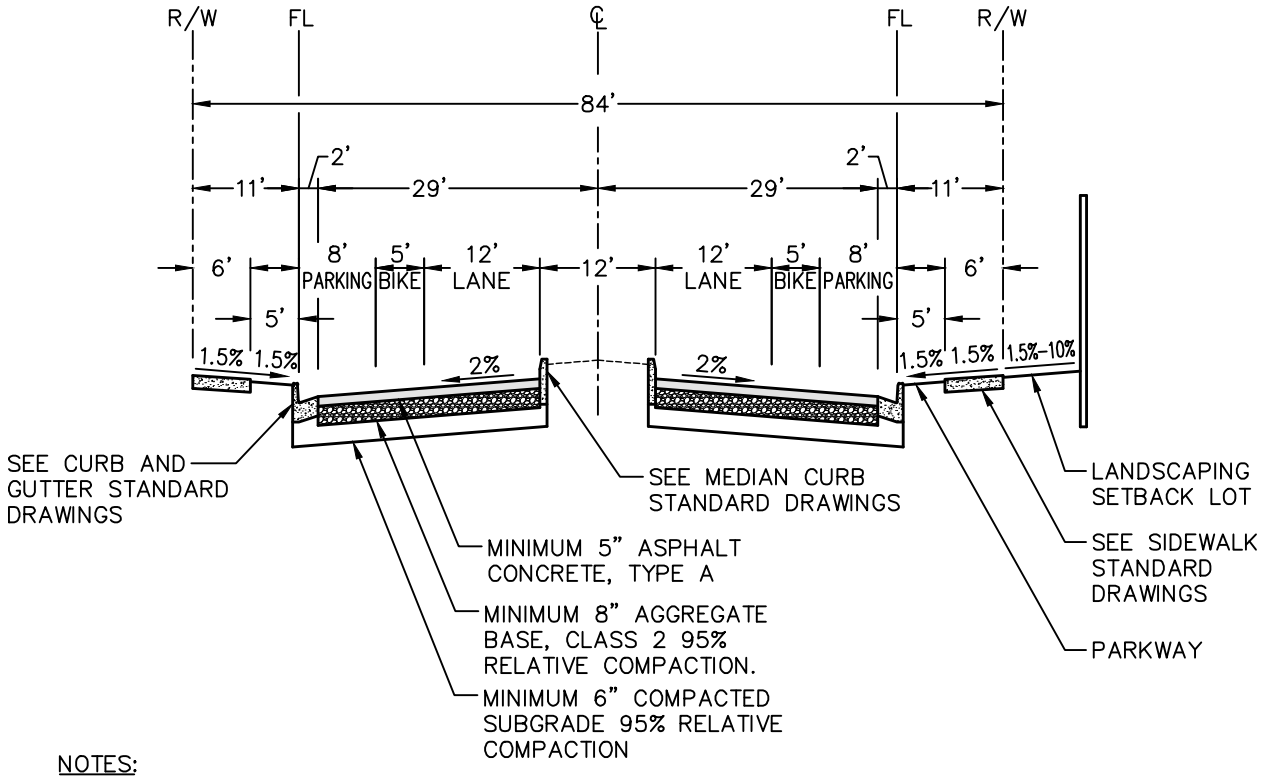
APPROVED BY: _____ 01/23/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

2 LANE LOCAL – INDUSTRIAL

REVISIONS
01/23/25
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NOTES:

1. DESIGN CRITERION: TRAFFIC INDEX SHALL BE 8.
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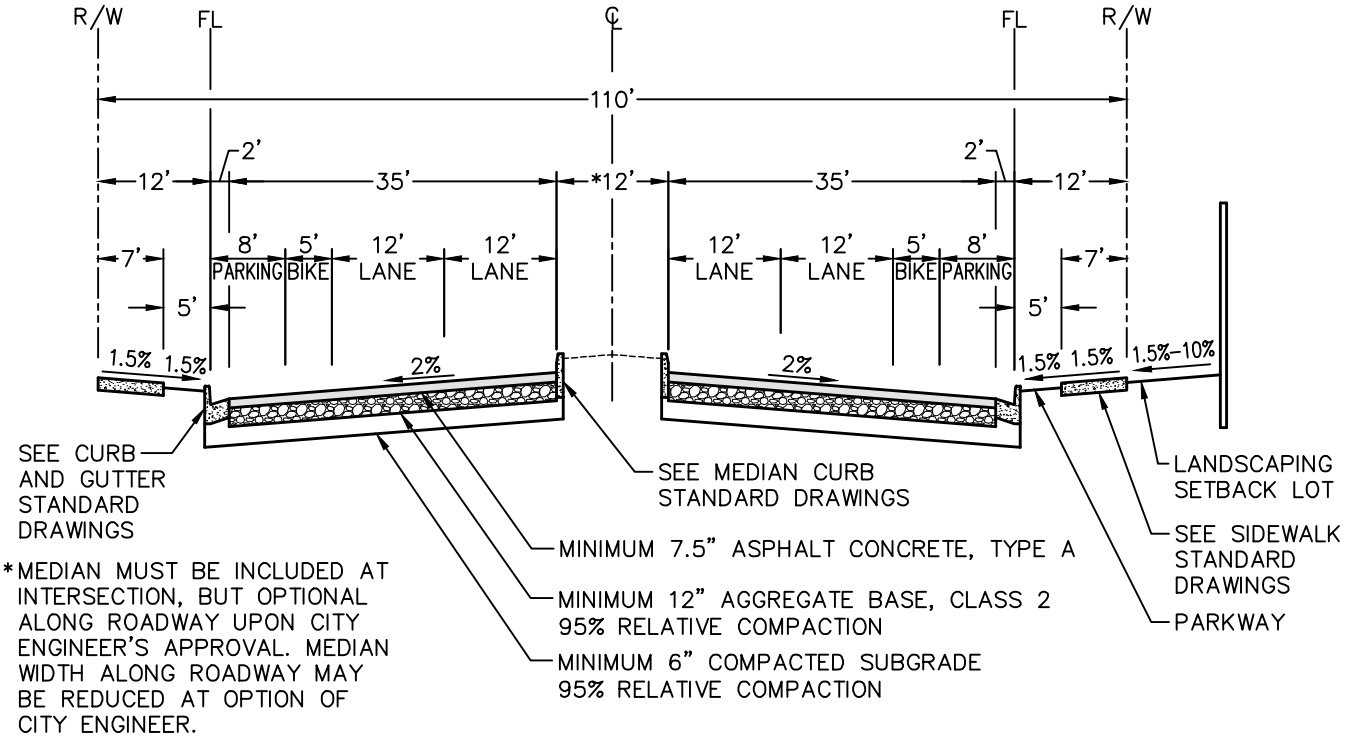
APPROVED BY: _____ 01/17/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

2 LANE COLLECTOR

REVISIONS
01/17/25
BK 2016

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*MEDIAN MUST BE INCLUDED AT INTERSECTION, BUT OPTIONAL ALONG ROADWAY UPON CITY ENGINEER'S APPROVAL. MEDIAN WIDTH ALONG ROADWAY MAY BE REDUCED AT OPTION OF CITY ENGINEER.

NOTES:

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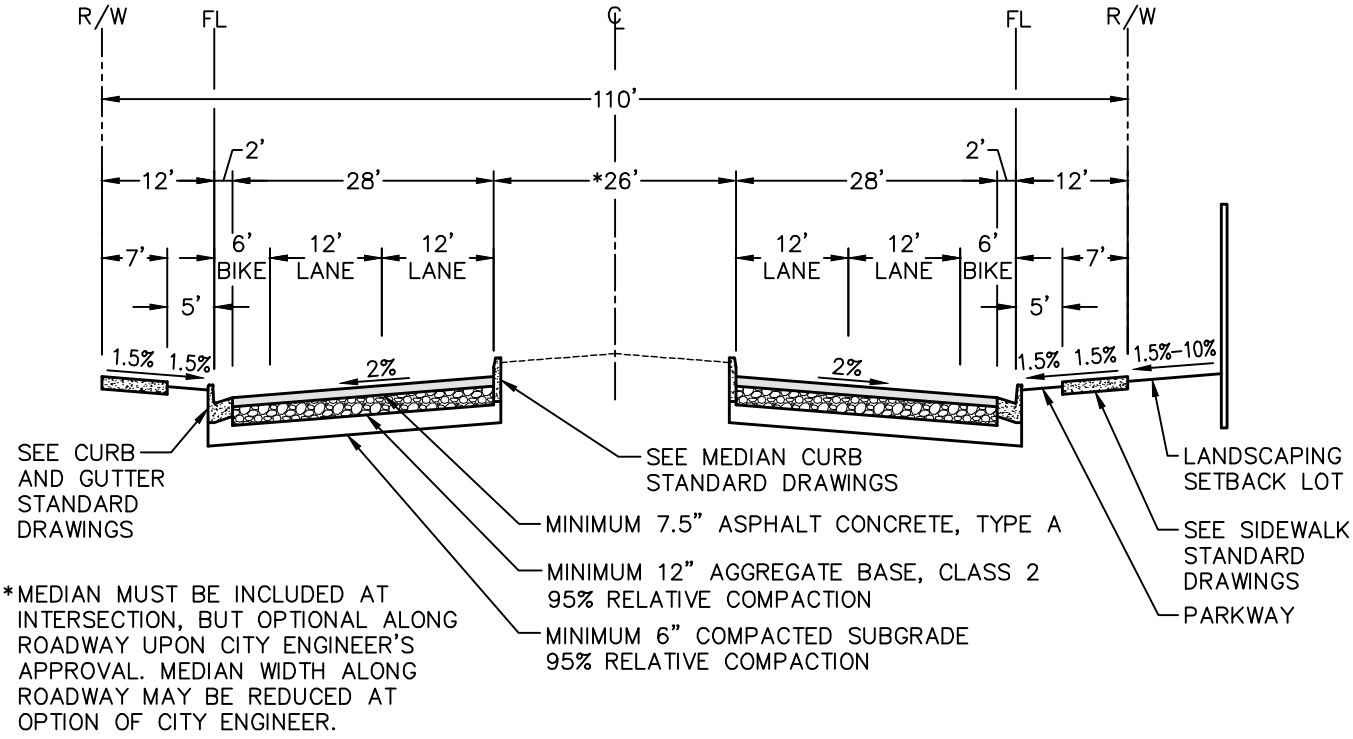
APPROVED BY: _____ 01/17/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

4 LANE COLLECTOR

REVISIONS
01/17/25
BK 2016

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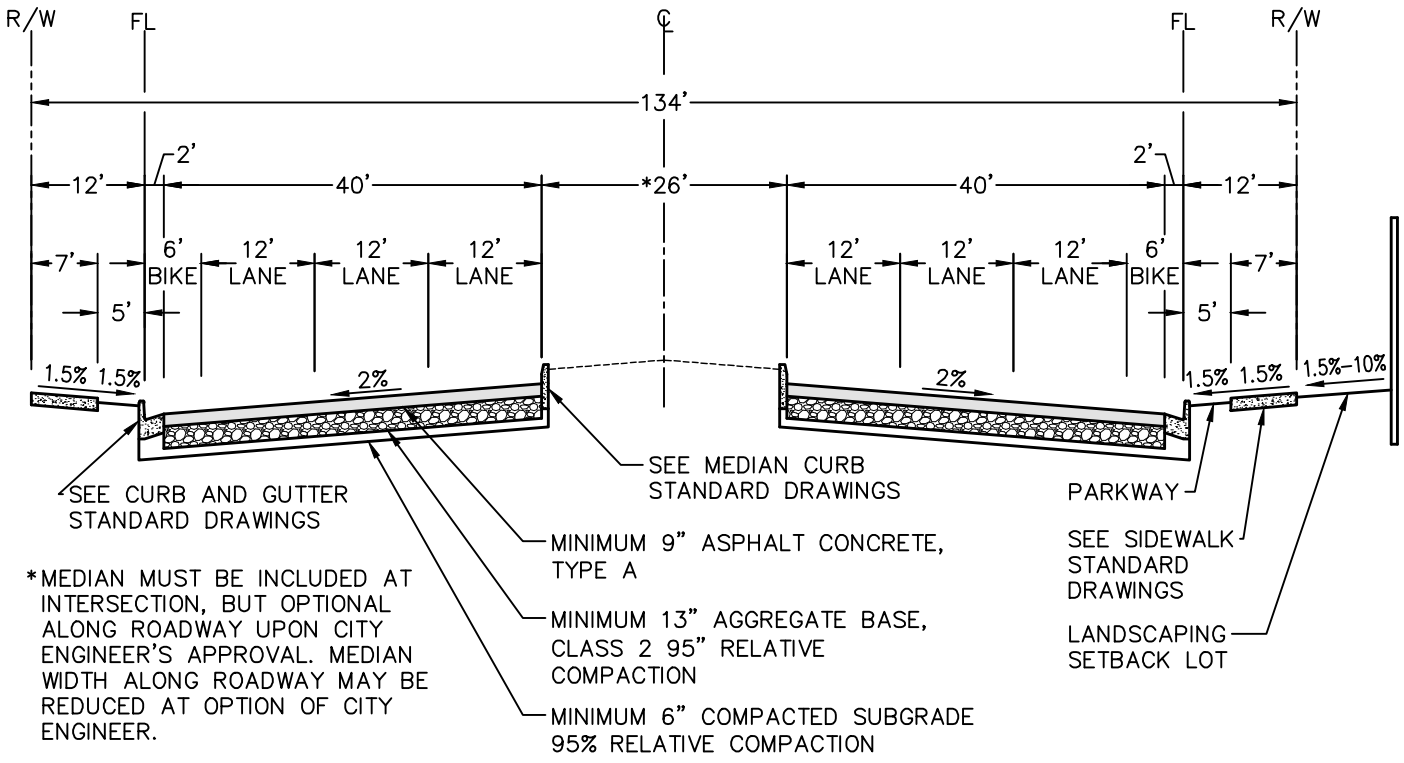
APPROVED BY: _____ 01/17/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

4 LANE ARTERIAL

REVISIONS
01/17/25
BK 2016

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NOTES:

1. DESIGN CRITERION: TRAFFIC INDEX SHALL BE 13.
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APPROVED BY: _____ 01/17/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

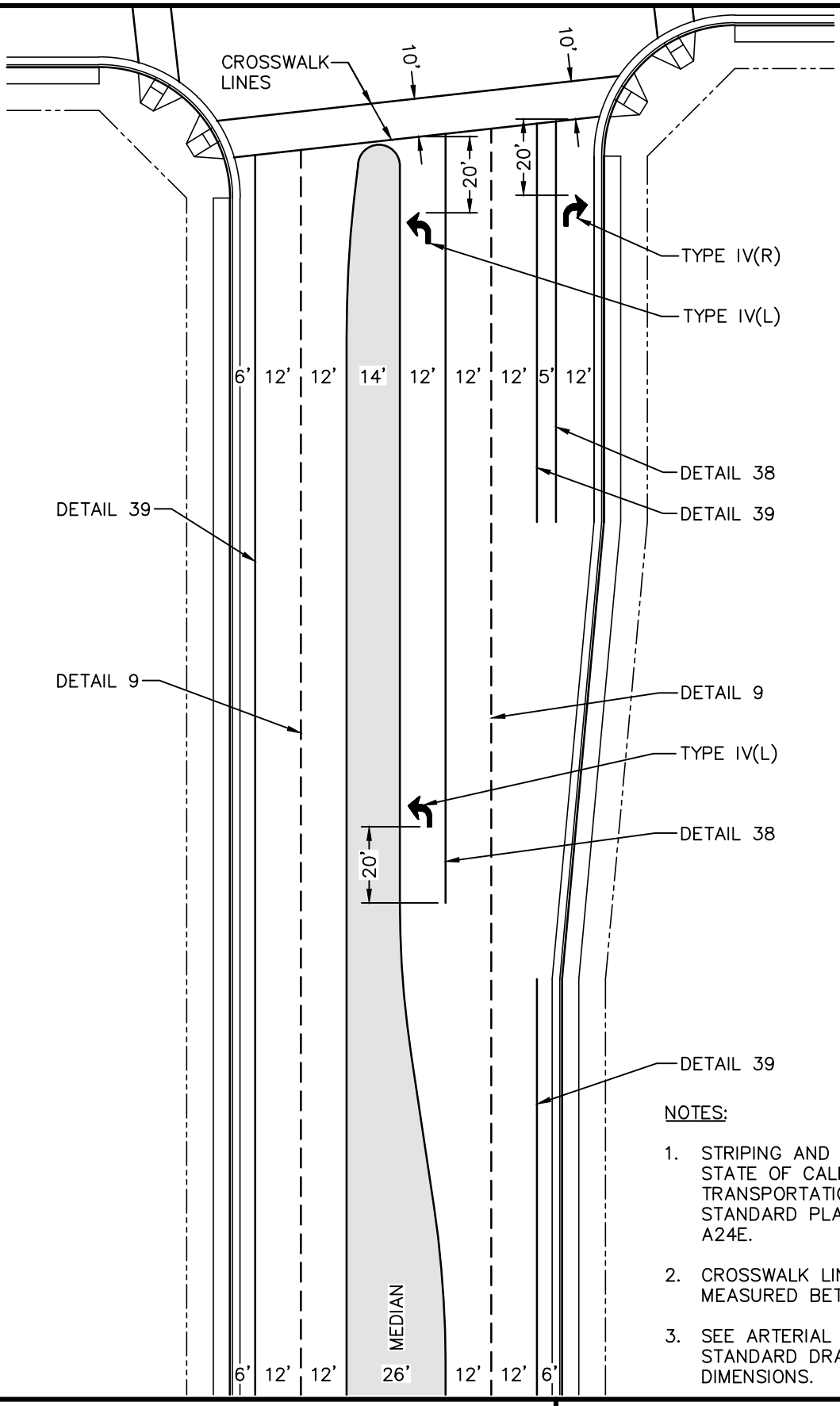
6 LANE ARTERIAL

REVISIONS
01/17/25
BK 2016

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RESERVED FOR FUTURE DETAIL

APPROVED BY: _____ _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS 09/09/16 BK 2016
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NOTES:

1. STRIPING AND PAVEMENT MARKINGS PER STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD PLANS, STANDARD PLANS NO. A20A THROUGH A24E.
2. CROSSWALK LINES SHALL BE 10' APART MEASURED BETWEEN INSIDE OF LINES.
3. SEE ARTERIAL INTERSECTION DESIGN STANDARD DRAWING FOR CONSTRUCTION DIMENSIONS.

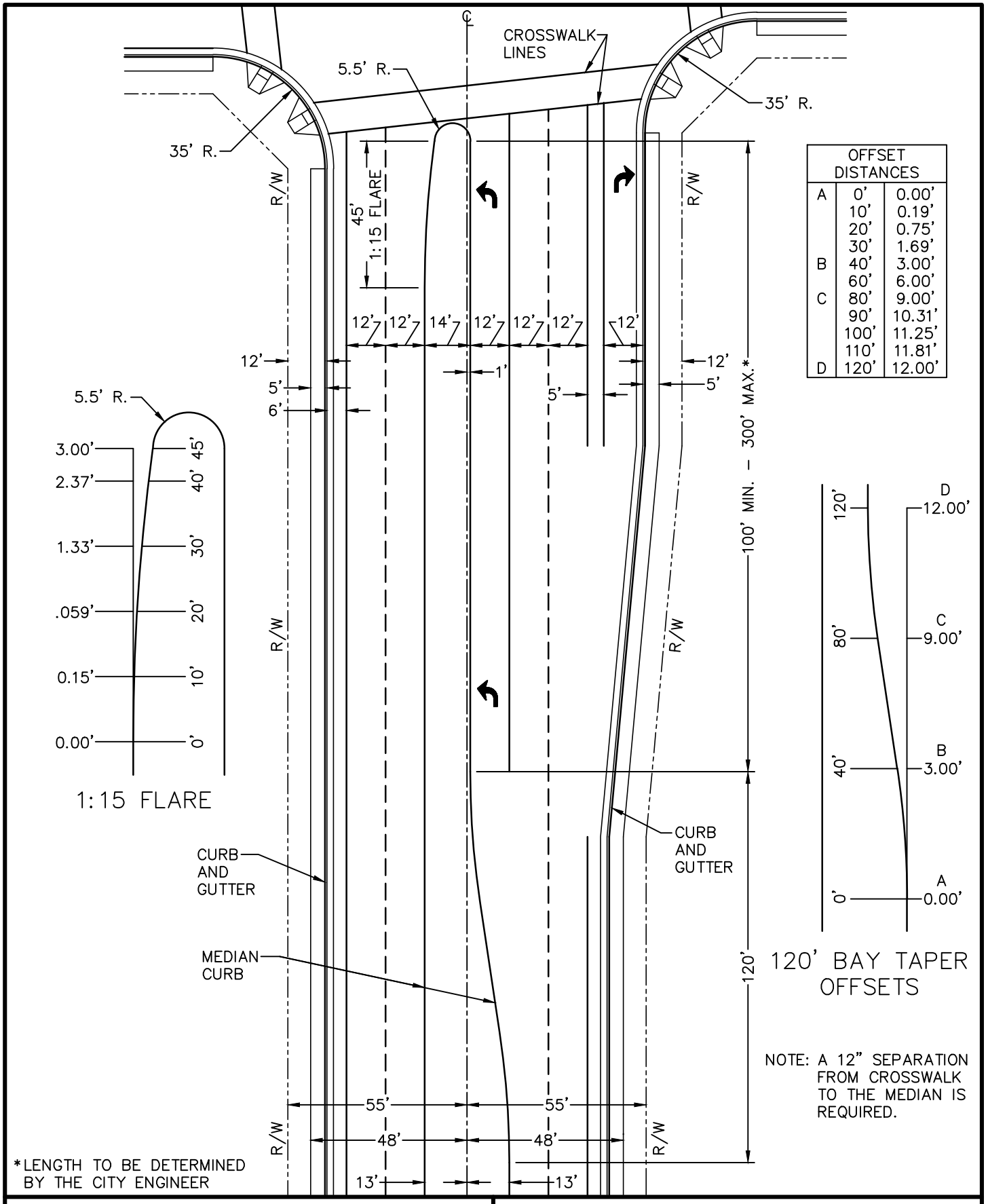
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ARTERIAL INTERSECTION STRIPING

REVISIONS
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OFFSET DISTANCES		
A	0'	0.00'
	10'	0.19'
	20'	0.75'
	30'	1.69'
B	40'	3.00'
	60'	6.00'
C	80'	9.00'
	90'	10.31'
	100'	11.25'
	110'	11.81'
D	120'	12.00'

1:15 FLARE

120' BAY TAPER OFFSETS

NOTE: A 12" SEPARATION FROM CROSSWALK TO THE MEDIAN IS REQUIRED.

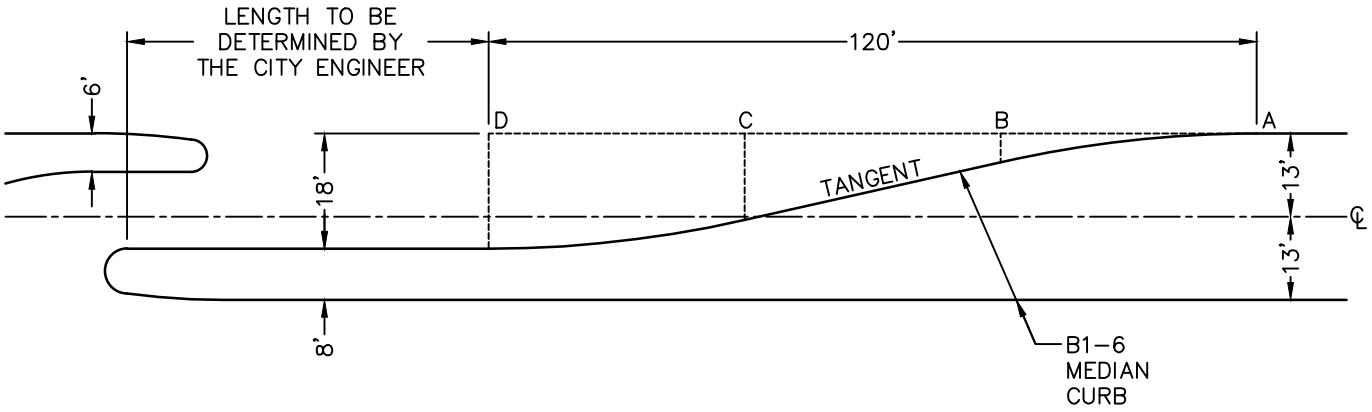
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ARTERIAL INTERSECTION DESIGN

REVISIONS
08/04/16
BK 2016

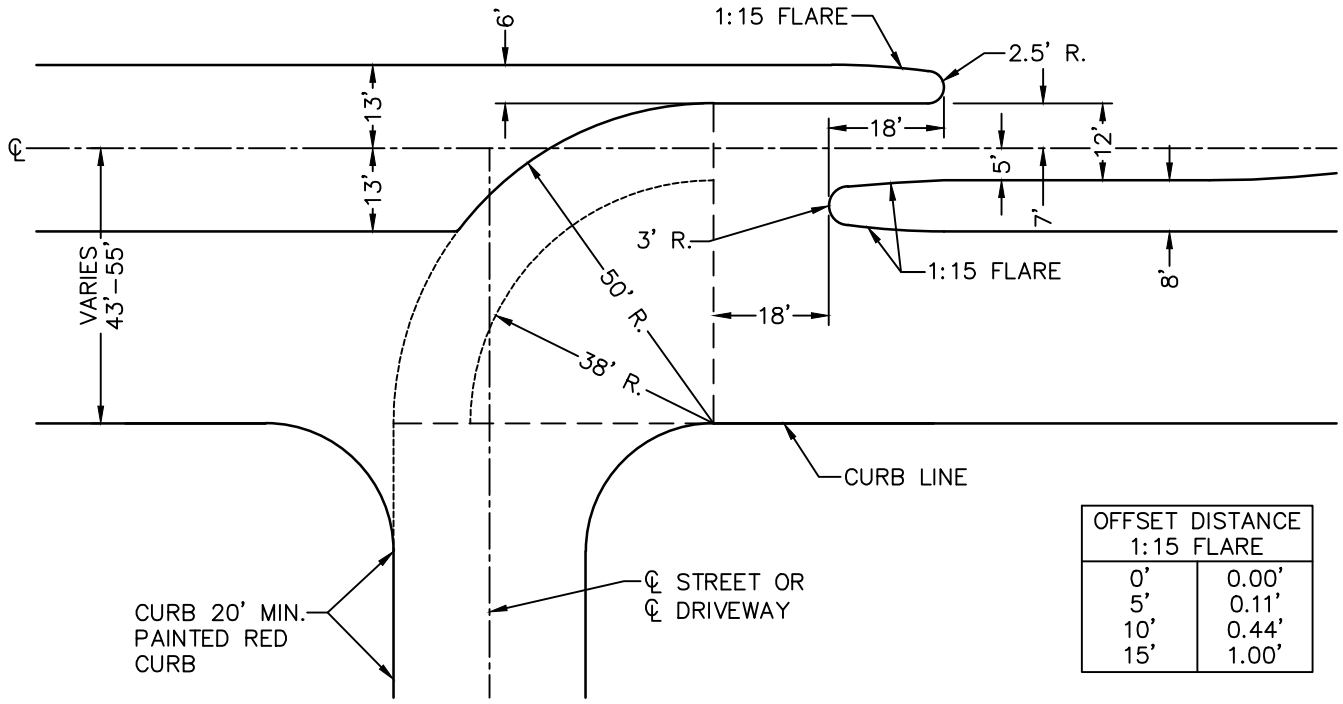
P–9



OFFSET DISTANCES		
A	0'	0.00'
	10'	0.25'
	20'	1.00'
	30'	2.25'
B	40'	4.00'
C	80'	12.00'
	90'	13.75'
	100'	15.00'
	110'	15.75'
D	120'	16.00'

OFFSET DISTANCES		
A	0'	0.00'
	10'	0.28'
	20'	1.13'
	30'	2.53'
B	40'	4.50'
C	80'	13.50'
	90'	15.47'
	100'	16.88'
	110'	17.72'
D	120'	18.00'

NOTE: MEDIAN WIDTH MAY BE REDUCED
AT OPTION OF THE CITY ENGINEER.



OFFSET DISTANCE 1:15 FLARE	
0'	0.00'
5'	0.11'
10'	0.44'
15'	1.00'

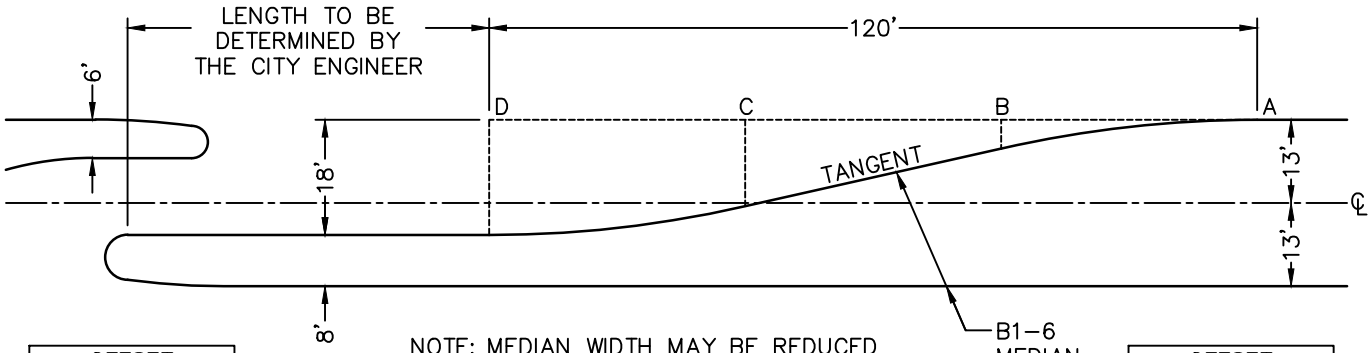
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ARTERIAL MEDIAN ISLAND OPENING FOR ONE-WAY LEFT TURN ONLY

REVISIONS
08/05/16
BK 2016

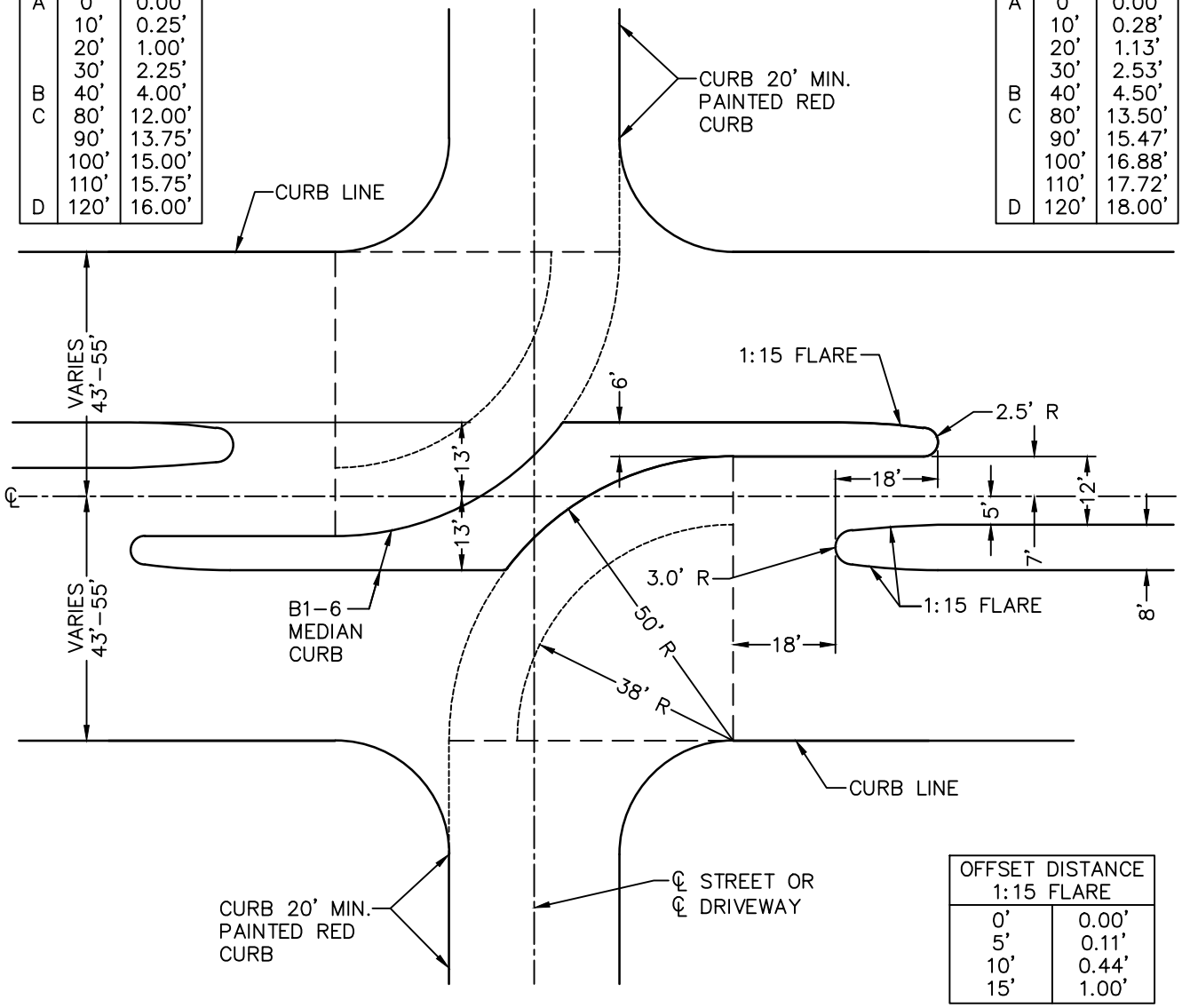
P-10



NOTE: MEDIAN WIDTH MAY BE REDUCED AT OPTION OF THE CITY ENGINEER.

OFFSET DISTANCES		
A	0'	0.00'
	10'	0.25'
	20'	1.00'
	30'	2.25'
B	40'	4.00'
C	80'	12.00'
	90'	13.75'
	100'	15.00'
	110'	15.75'
D	120'	16.00'

OFFSET DISTANCES		
A	0'	0.00'
	10'	0.28'
	20'	1.13'
	30'	2.53'
B	40'	4.50'
C	80'	13.50'
	90'	15.47'
	100'	16.88'
	110'	17.72'
D	120'	18.00'



OFFSET DISTANCE 1:15 FLARE	
0'	0.00'
5'	0.11'
10'	0.44'
15'	1.00'

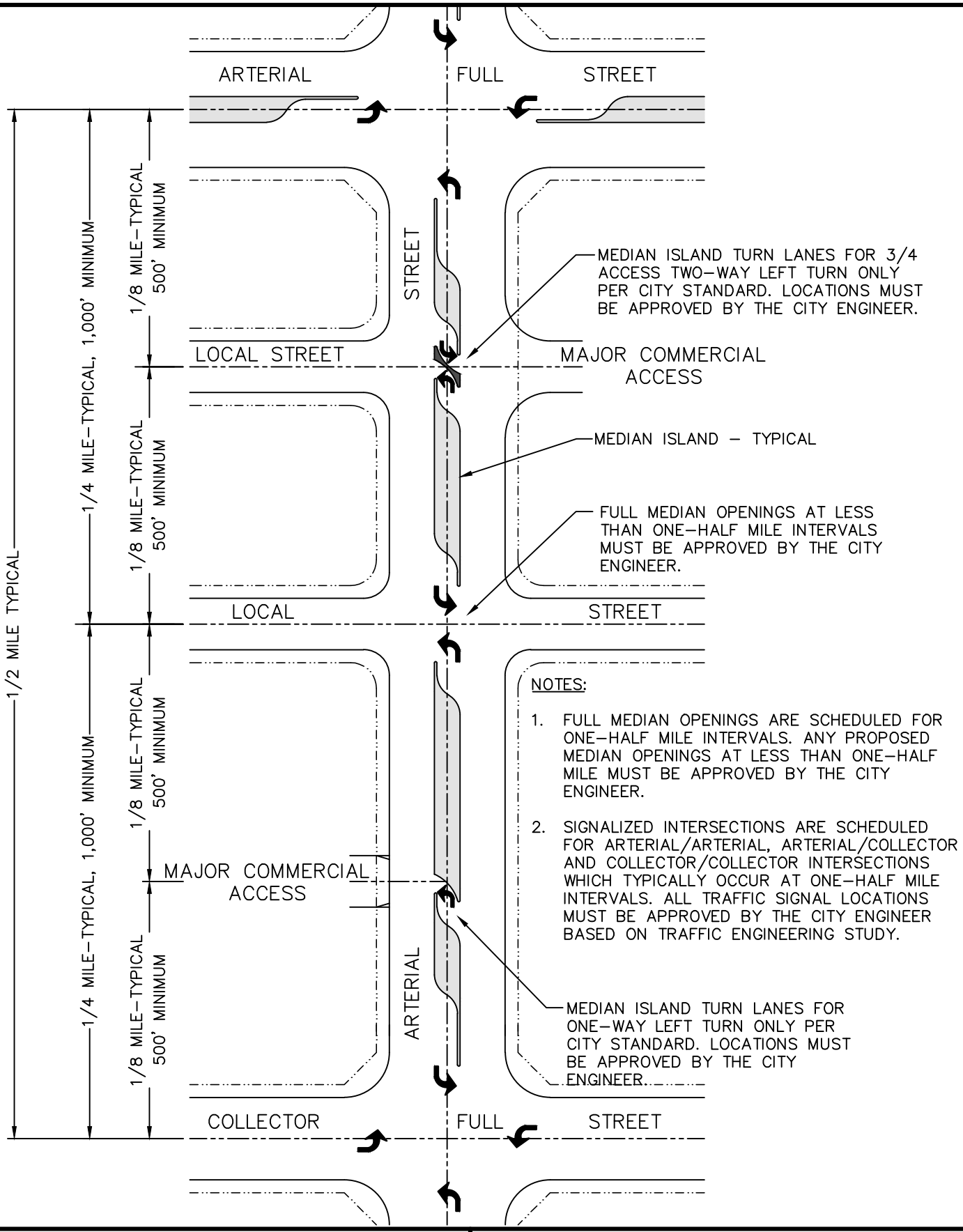
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ARTERIAL MEDIAN ISLAND OPENING FOR TWO-WAY LEFT TURN ONLY

REVISIONS
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BK 2016

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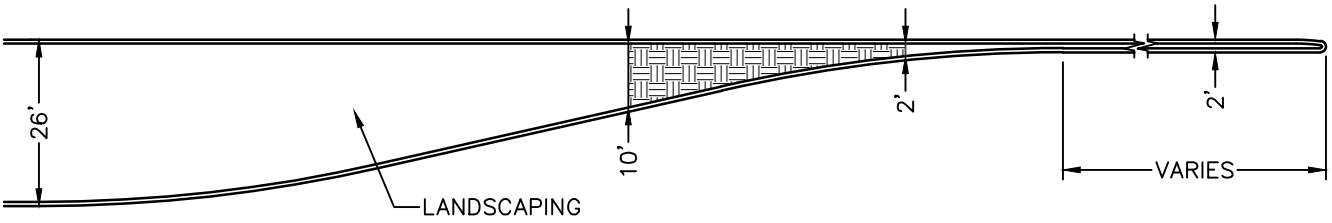
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

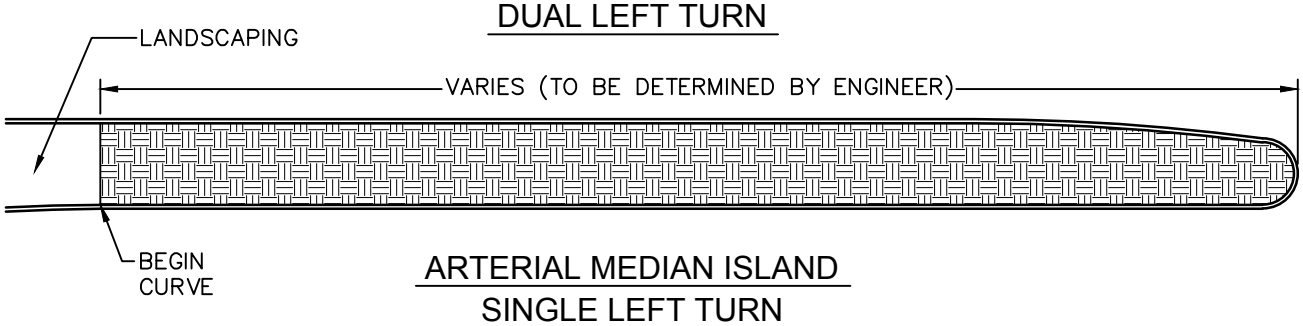
TYPICAL MEDIAN BREAK LOCATIONS

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BK 2016

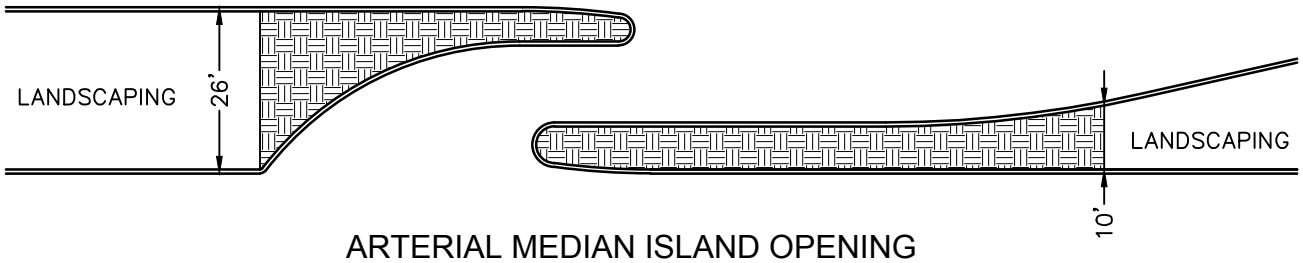
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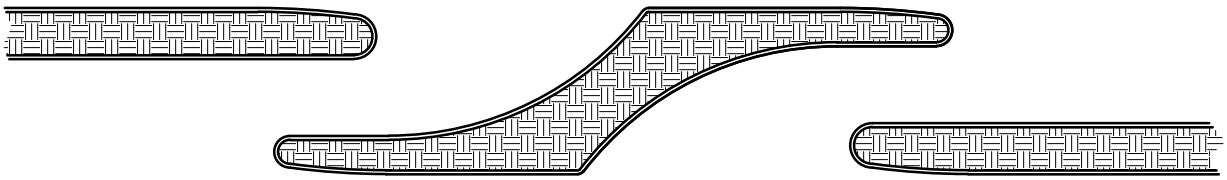
ARTERIAL MEDIAN ISLAND
DUAL LEFT TURN



ARTERIAL MEDIAN ISLAND
SINGLE LEFT TURN



ARTERIAL MEDIAN ISLAND OPENING
FOR ONE-WAY LEFT TURN ONLY



ARTERIAL MEDIAN ISLAND OPENING
FOR TWO-WAY LEFT TURN ONLY

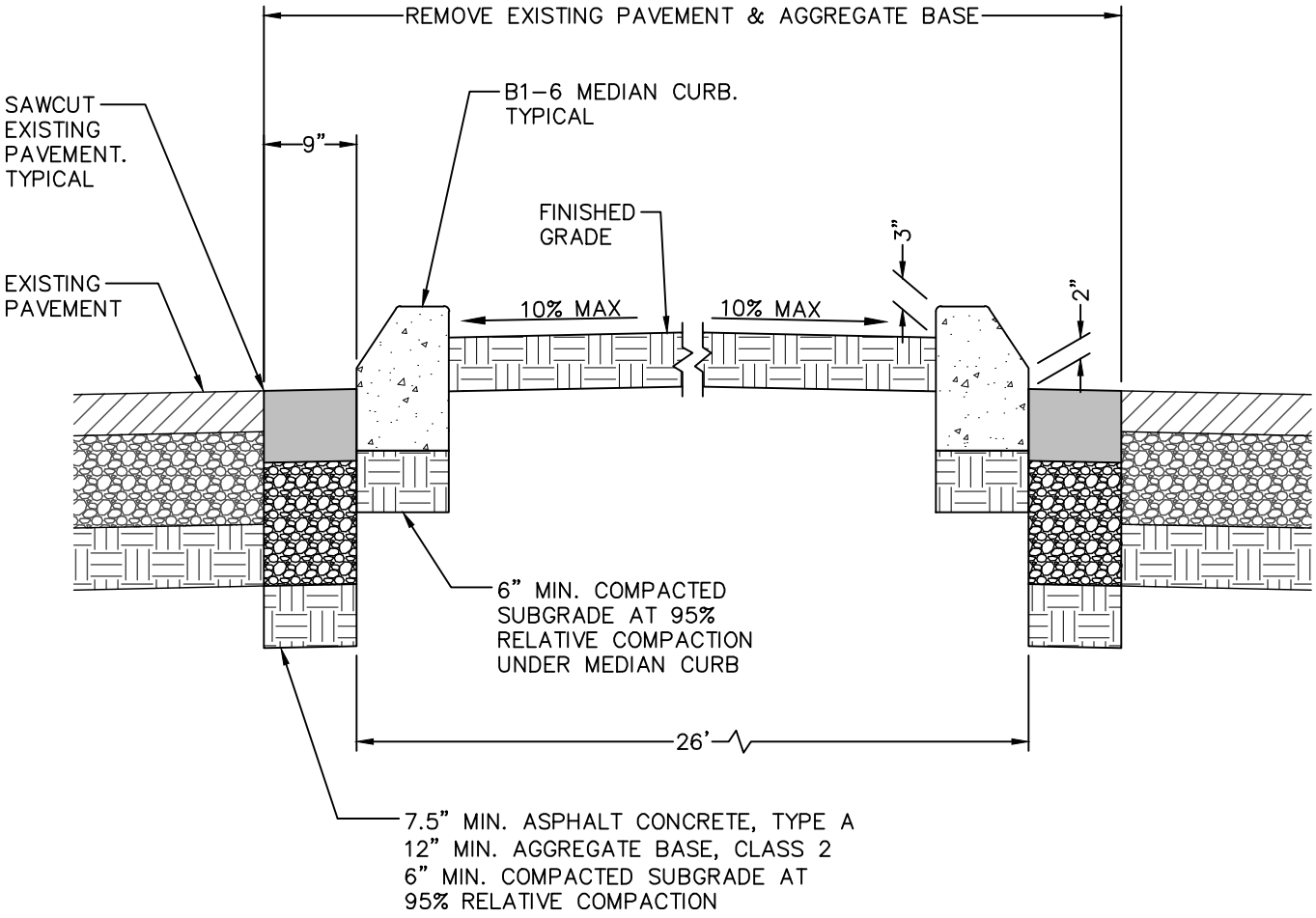
LEGEND:

STAMPED CONCRETE PER CITY STANDARD SPECIFICATIONS OR AS DIRECTED BY CITY ENGINEER

NOTES:

1. ANY MEDIAN SPACE LESS THAN 2' BACK OF CURB TO BACK OF CURB SHALL BE SOLID CONCRETE FINISH.
2. END STAMPED CONCRETE WHERE MEDIAN ISLAND WIDTH IS 10' BACK OF CURB TO BACK OF CURB.
3. SLEEVES SHALL BE PROVIDED THROUGH MEDIAN CONCRETE. IF CONDUIT OR OTHER IMPROVEMENT NEEDS TO RUN THROUGH MEDIAN CONCRETE IT SHALL BE DONE THROUGH BORING, NOT TRENCHING.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
STAMPED CONCRETE & LANSCAPING LOCATIONS IN ARTERIAL MEDIANS	REVISIONS 08/05/16 BK 2016
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NOTE:

1. IF EXISTING PAVEMENT SECTION IS THICKER THAN SECTION THICKNESS MENTIONED ABOVE, THE PAVEMENT TO BE INSTALLED SHALL MATCH EXISTING.
2. IF MEDIAN WIDTH IS LESS THAN 6 FEET, THE MEDIAN SLOPE MAY BE INCREASED UP TO 25%.
3. MEDIAN IMPROVEMENTS, INCLUDING LANDSCAPING, SHALL NOT EXCEED 30" IN HEIGHT WITHIN THE SIGHT TRIANGLE AREA.
4. FULL DEPTH ASPHALT CONCRETE PLUG MAY BE ALLOWED WITH APPROVAL OF CITY ENGINEER.

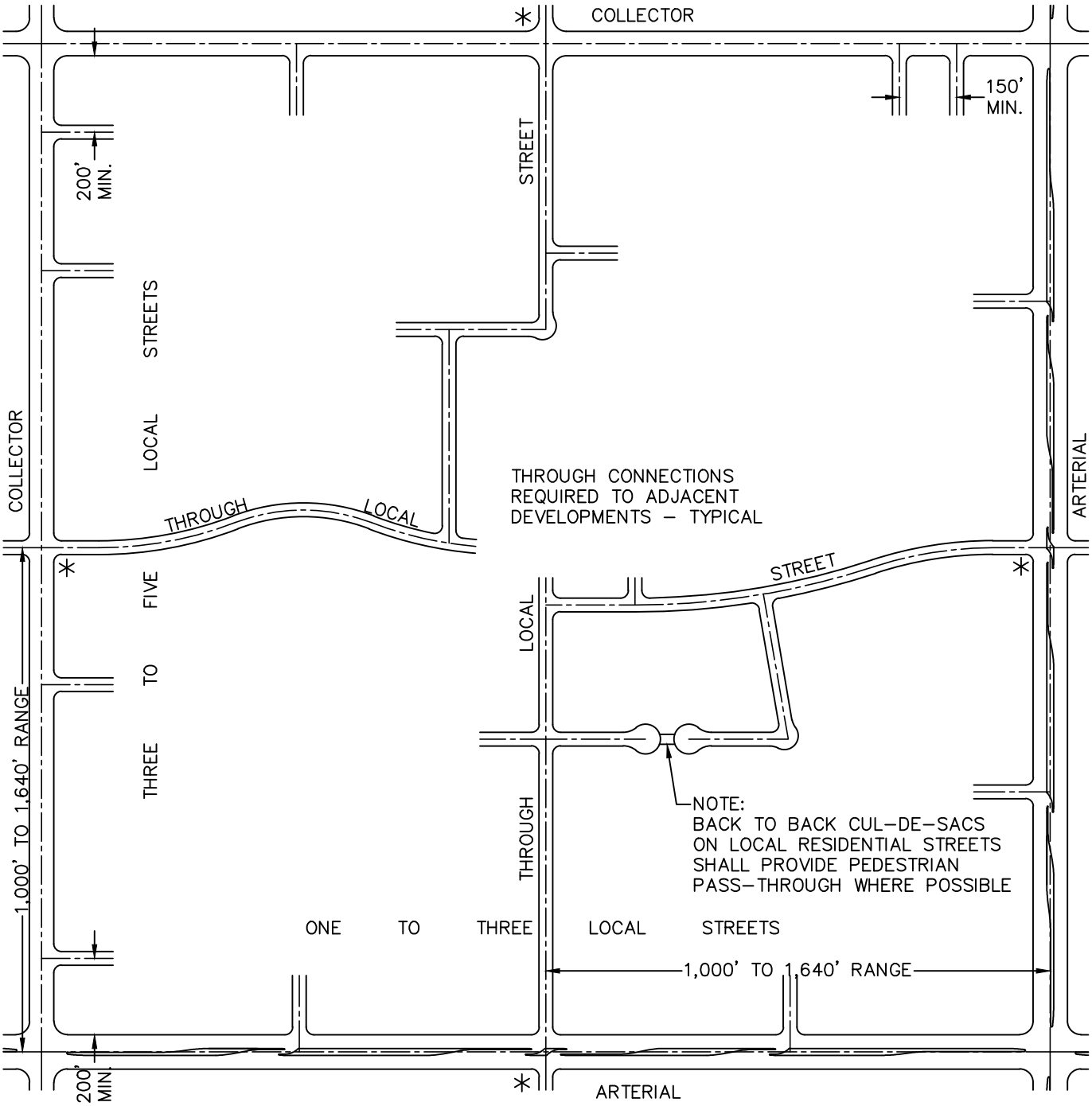
APPROVED BY: _____ 01/17/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ARTERIAL MEDIAN INSTALLATION IN EXISTING PAVEMENT

REVISIONS
01/17/25
BK 2016

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* THE INTENT OF THIS POLICY IS TO PROVIDE FULL ACCESS FROM EACH ASTRISK NOTED INTERSECTION TO EACH DEVELOPMENT WITHIN THE SUPER BLOCK WITHOUT USING A COLLECTOR OR ARTERIAL.

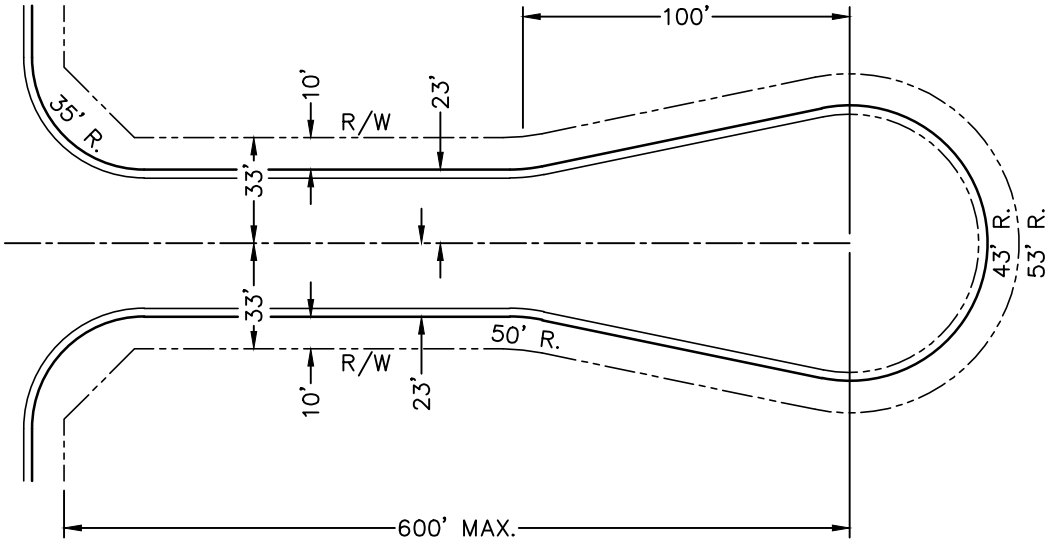
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

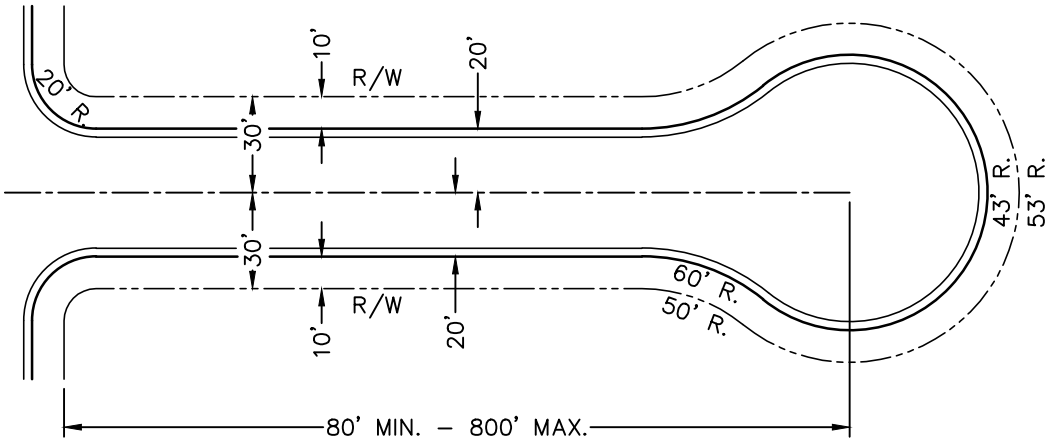
SUPER BLOCK CONNECTIVITY

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08/10/16
BK 2016

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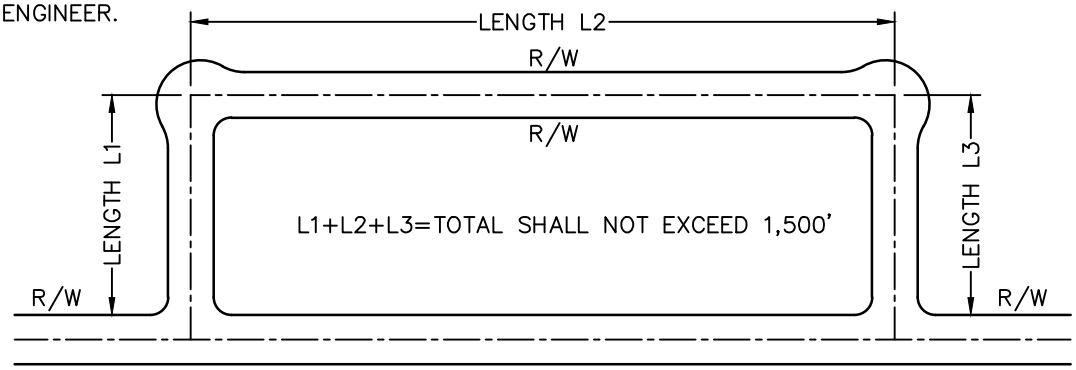


COMMERCIAL AND INDUSTRIAL CUL-DE-SAC



RESIDENTIAL CUL-DE-SAC

NOTE:
DESIGNS TO PERMIT PARKING IN CUL–DE–SAC CENTERS ARE SUBJECT TO APPROVAL OF THE CITY ENGINEER.



LOCAL MINOR LOOP STREET

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

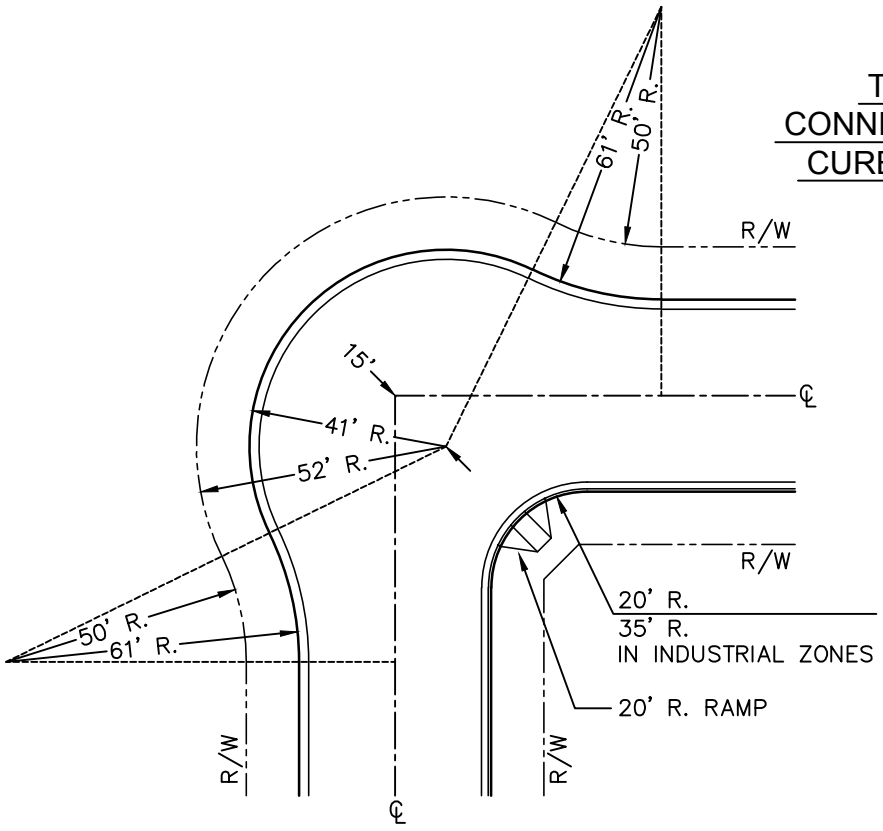
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

CUL–DE–SAC AND LOCAL MINOR LOOP LAYOUT

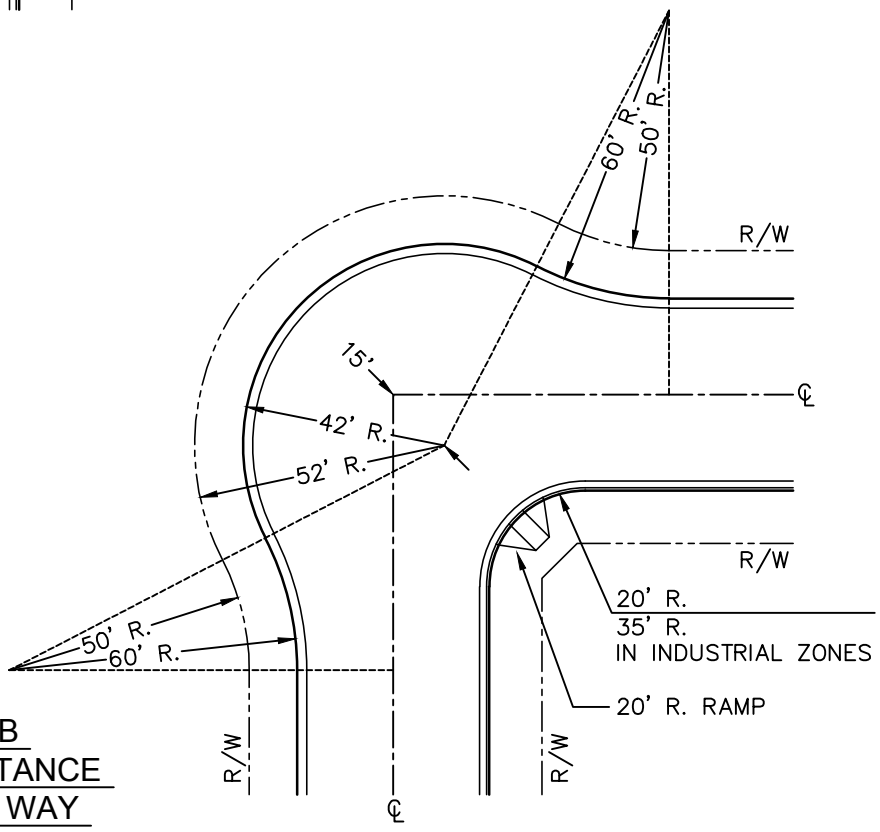
REVISIONS
08/10/16
BK 2016

P–16

TYPICAL STREET BULB CONNECTION WITH 11' DISTANCE CURB FACE TO RIGHT OF WAY



TYPICAL STREET BULB CONNECTION WITH 10' DISTANCE CURB FACE TO RIGHT OF WAY



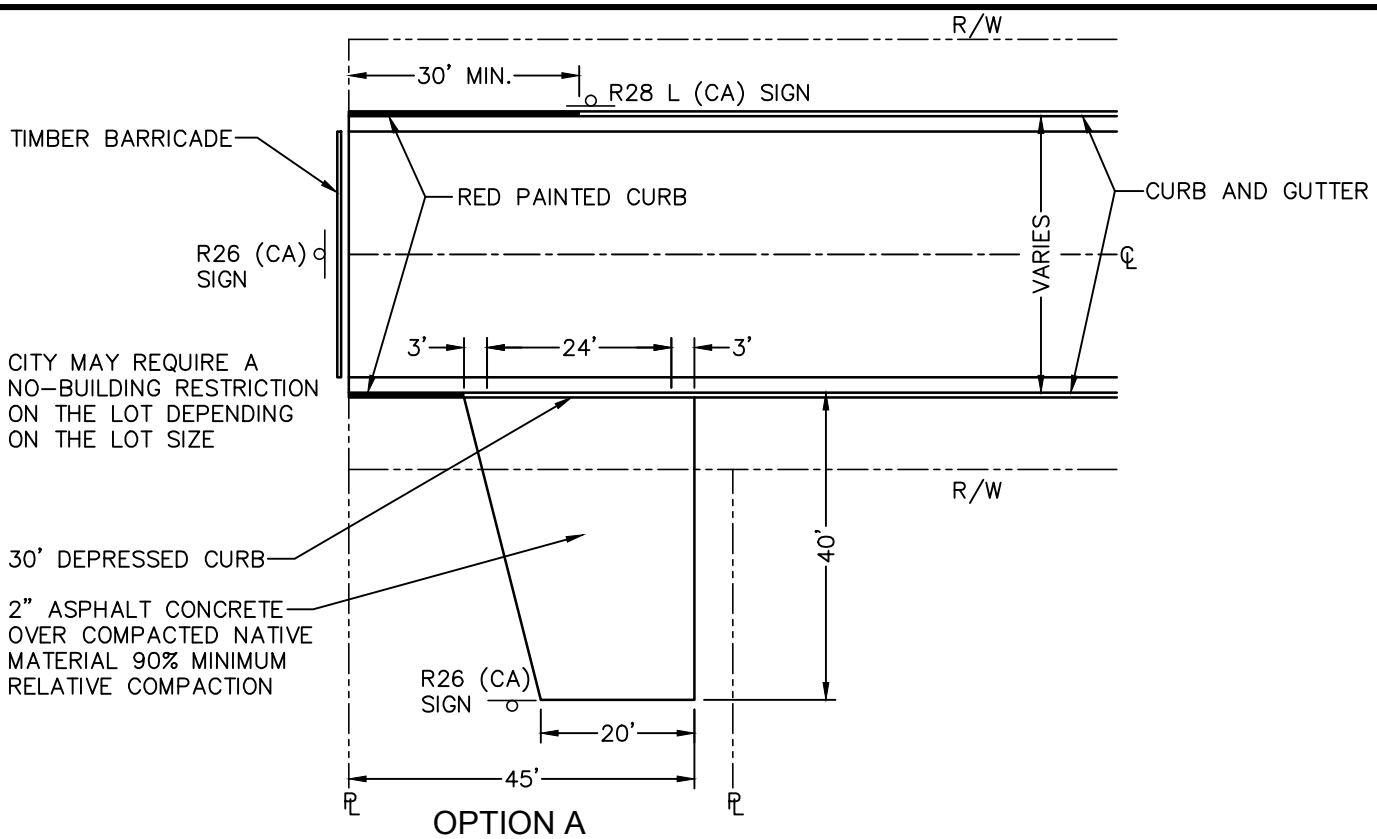
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE

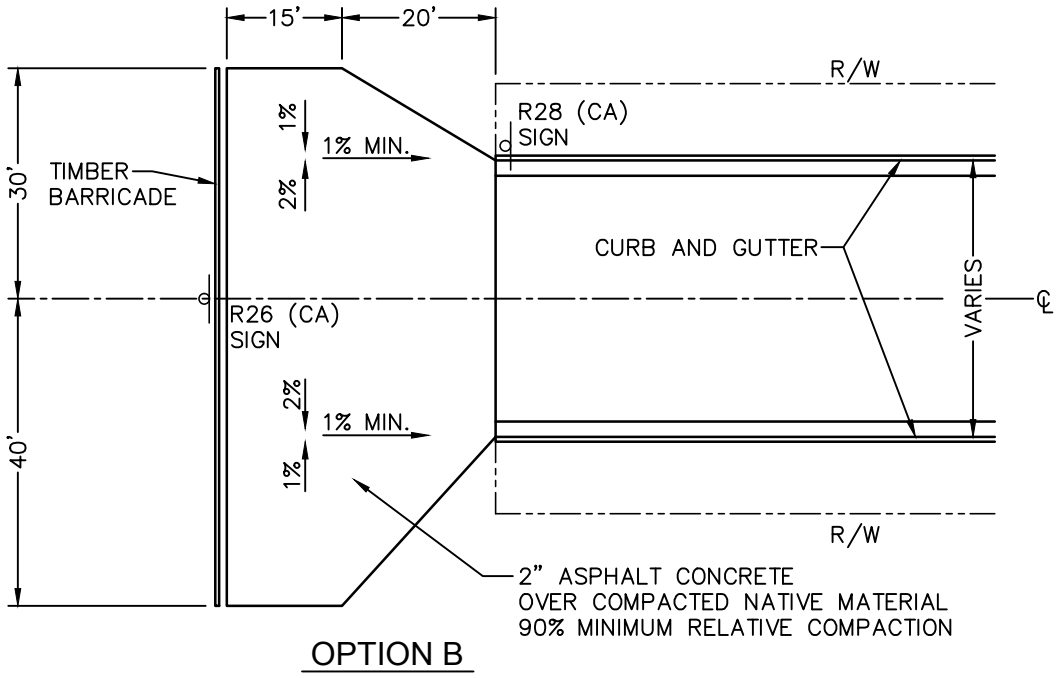
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

STREET BULB CONNECTION

REVISIONS
08/10/16
BK 2016

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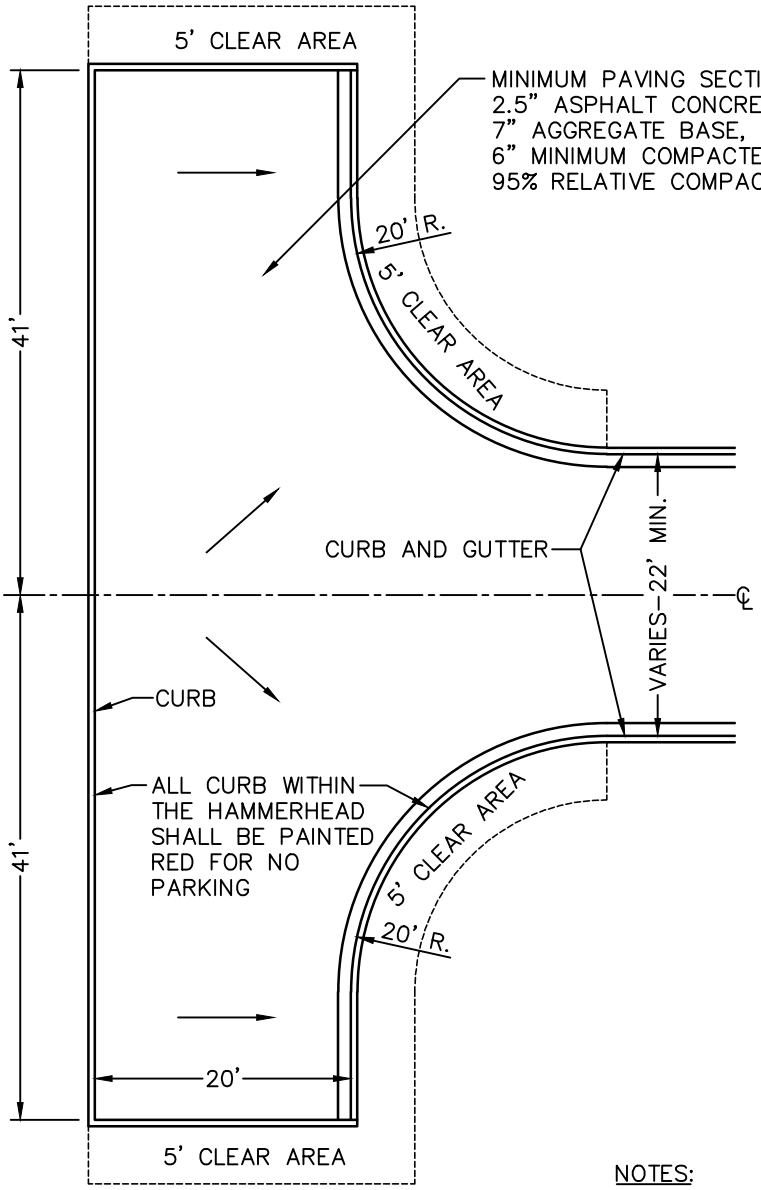




NOTES:

1. THESE STANDARDS ARE INTENDED FOR PUBLIC STREETS IN PHASED DEVELOPMENTS ON A TEMPORARY BASIS ONLY.
2. TURNAROUND SHALL BE REQUIRED WHEN A STUB STREET IS IN EXCESS OF 2 LOTS OR IN EXCESS OF 150 FEET FROM THROUGH STREET.
3. USE OTHER THAN TEMPORARY SHALL BE AT THE DISCRETION OF THE CITY ENGINEER.

APPROVED BY: CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
TEMPORARY HAMMERHEAD TURNAROUND PUBLIC STREET	REVISIONS 08/10/16 BK 2016 — P-18



NOTES:

1. NO PARKING ALLOWED.
2. DESIGN CRITERION: TRAFFIC INDEX 5.5.
3. CURB OR CURB AND GUTTER REQUIRED AT ALL PAVEMENT EDGES.
4. NO ABOVE GROUND STRUCTURES SHALL BE ALLOWED IN THE 5' CLEAR AREAS AS SHOWN.
5. THE USE OF THIS STANDARD MUST BE APPROVED BY THE CITY OF VISALIA SOLID WASTE DIVISION.

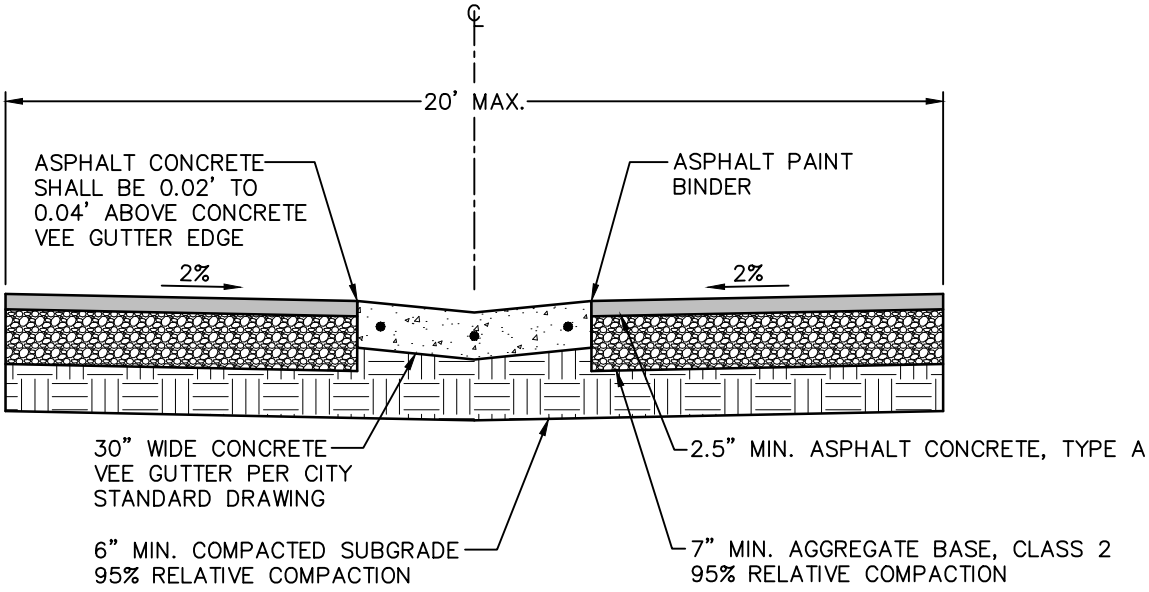
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

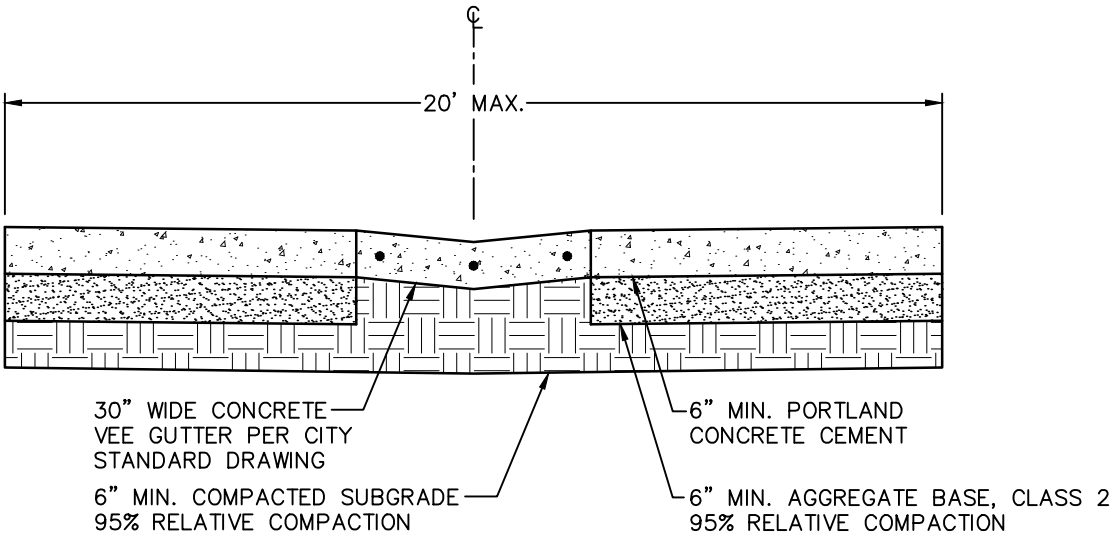
PERMANENT HAMMERHEAD TURNAROUND

REVISIONS
08/10/16
BK 2016

P–19



ASPHALT CONCRETE SURFACE



CONCRETE SURFACE

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. ALL CONCRETE SHALL HAVE A LIGHT BROOM FINISH.
3. DESIGN CRITERIA: TRAFFIC INDEX 5.5
4. STRUCTURAL SECTIONS SHALL BE DETERMINED BASED ON T.I. AND R-VALUES AS TABULATED IN THE STREET SECTION REQUIREMENTS STANDARD DETAIL.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS	
ALLEY PAVING SECTIONS	REVISIONS 08/10/16 BK 2016	P-20

PRIVATE STREET GUIDELINES

PAVEMENT WIDTHS:

1. PRIVATE STREETS SHALL PROVIDE A PAVEMENT WIDTH COMMENSURATE WITH THE PROPOSED DESIGN SPEED, TRAFFIC VOLUME, ALIGNMENT AND PARKING REQUIREMENTS.

2. A STREET PAVEMENT WIDTH OF 24', AND PARKING STALLS 20' IN LENGTH SHALL BE CONSIDERED MINIMUM IF THE PARKING STALLS ARE ORIENTED PERPENDICULAR TO THE STREET AND IF VEHICLES BACK INTO THE STREET TO EXIT. PARKING SPACES ORIENTED OTHERWISE SHALL CONFORM TO THE CITY OF VISALIA PARKING STANDARDS.

3. PRIVATE STREETS WITH ENTRY GATES SHALL PROVIDE A U-TURN AREA WITHIN THE PUBLIC RIGHT OF WAY. THE MINIMUM TURNING RADIUS SHALL BE 24'.

4. STREET ENDS, COURTS OR DRIVEWAYS SHALL PROVIDE SOLID WASTE TRUCKS SERVICING INDIVIDUAL REFUSE CONTAINERS A MINIMUM OUTSIDE TURNING RADIUS OF 35' AND A MAXIMUM INSIDE TURNING RADIUS OF 20'. SOLID WASTE TRUCKS PROVIDING SERVICE TO REFUSE BINS REQUIRE A MINIMUM OUTSIDE TURNING RADIUS OF 50' AND A MAXIMUM INSIDE TURNING RADIUS OF 36'.

5. THE UNIFORM FIRE CODE REQUIRES THAT THE MOST REMOTE WALL OF ANY BUILDING MUST BE WITHIN 150' OF A PAVED DRIVE OR STREET NOT LESS THAN 20' WIDE. ACCESS TO BUILDINGS CONFORMING TO THIS REQUIREMENT SHALL PROVIDE A 14' MINIMUM PAVED ACCESS DRIVE AND A 20' MINIMUM UNOBSTRUCTED ACCESS EASEMENT. ACCESS TO BUILDINGS IN EXCESS OF TWO STORIES SHALL COMPLY TO MORE STRINGENT REQUIREMENTS OF THE FIRE CODE.

STRUCTURAL SECTIONS:

1. THE STRUCTURAL SECTIONS OF STREETS UTILIZING ASPHALT CONCRETE SURFACING SHALL BE DESIGNED BY AN ACCEPTED FLEXIBLE PAVEMENT DESIGN METHOD.

2. THE MINIMUM STREET SECTION SHALL CONSIST OF A 2-1/2" TYPE A, 3/4" MAXIMUM, MEDIUM GRADE ASPHALT CONCRETE SURFACE, A 7" SECTION OF AGGREGATE BASE, CLASS 2, AND A 6" MINIMUM SOIL SUBGRADE COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION.

3. PARKING AREAS AND ACCESS DRIVES MAY USE A PORTLAND CEMENT CONCRETE SURFACE A MINIMUM OF 6" THICK OVER A 6" AGGREGATE BASE OVER A 6" MINIMUM SOIL SUBGRADE COMPACTED TO A MINIMUM OF 90% RELATIVE COMPACTION.

TRAFFIC INDEXES:

1. THE CITY ENGINEER SHALL ESTABLISH TRAFFIC INDEXES FOR PRIVATE STREETS BASED UPON EXPECTED TRAFFIC VOLUMES AS INDICATED BELOW:

RESIDENTIAL UNITS USING STREET	MINIMUM TRAFFIC INDEX
1-150	5.5

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

PRIVATE STREET GUIDELINES
SHEET 1 OF 2

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PRIVATE STREET GUIDELINES CONTINUED

GEOMETRIC SECTIONS

1. DRIVES SERVING 1 TO 4 UNITS SHALL USE A LOCAL ROAD PAVING SECTION STANDARD EXCEPTING THAT PAVEMENT EDGES SHALL BE PROTECTED WITH A 6" TALL CONCRETE CURB. SUBJECT TO SITE PLAN REVIEW, THE CURBING REQUIREMENT MAY BE WAIVED.

2. DRIVES OR STREETS SERVING 5 OR MORE UNITS SHALL PROVIDE A CURB OR CURB AND GUTTER AT ALL PAVEMENT EDGES.

3. PAVEMENT SHALL HAVE A MINIMUM CROSS SLOPE OF 1% AND PAVEMENT SECTIONS SHOULD MATCH THE EQUIVALENT LOCAL PUBLIC STREET.

4. BARRIER TYPE CURB AND GUTTER TYPE A2–6, IS RECOMMENDED FOR PRIVATE STREETS. THE FOLLOWING ARE PERMITTED OPTIONS.

   A. VEE GUTTER, 24" MINIMUM WIDTH, SLOPE = 0.25 FEET PER 100 FEET MINIMUM.

   B. MINI CURB AND GUTTER, 4" CURB HEIGHT AND 12" GUTTER, SLOPE = 0.20 FEET PER 100 FEET MINIMUM.

   C. MINI ROLL CURB AND GUTTER, 4" CURB HEIGHT AND 12" GUTTER, SLOPE = 0.30 FEET PER 100 FEET MINIMUM.

5. FOR NEW ROADWAYS THAT ARE BEING CONSTRUCTED WHERE A PREVIOUS ROAD DID NOT EXIST, ALL ROADWAY INFRASTRUCTURE SHALL BE INSTALLED & OPERATIONAL PRIOR TO OPENING. THIS INCLUDES SIGNAGE, STRIPING, AND ROADWAY LIGHTING.

REQUIRED SIGNS:

1. THE ENTRANCE TO ANY PRIVATE STREET FROM A PUBLIC RIGHT OF WAY SHALL HAVE A SIGN "PRIVATE STREET" POSTED AT THE ENTRANCE.

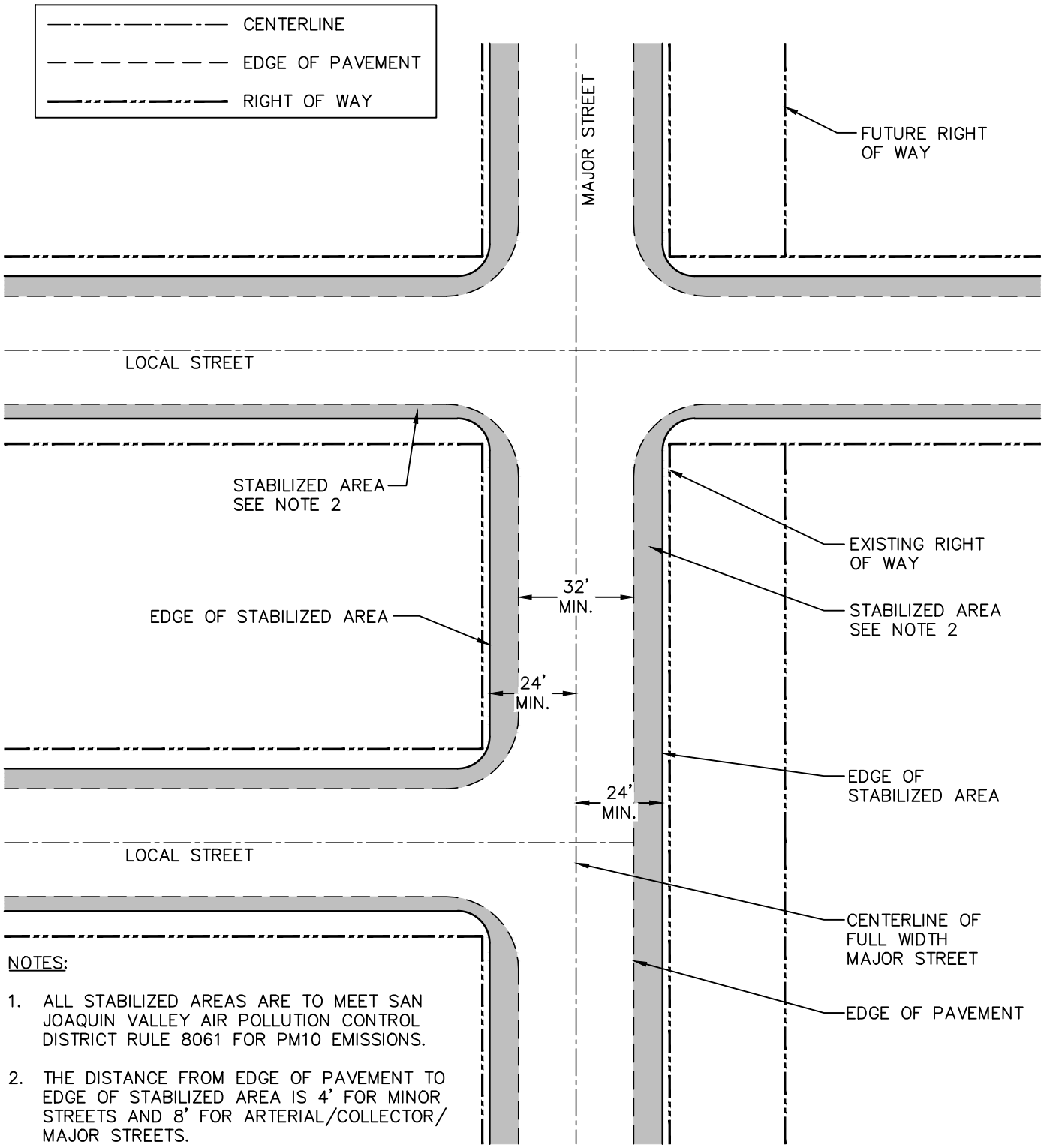
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

PRIVATE STREET GUIDELINES
SHEET 2 OF 2

REVISIONS
08/10/16
BK 2016

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NOTES:

1. ALL STABILIZED AREAS ARE TO MEET SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT RULE 8061 FOR PM10 EMISSIONS.
2. THE DISTANCE FROM EDGE OF PAVEMENT TO EDGE OF STABILIZED AREA IS 4' FOR MINOR STREETS AND 8' FOR ARTERIAL/COLLECTOR/ MAJOR STREETS.
3. NEW PAVED ROADS OR MODIFICATIONS TO EXISTING PAVED ROADS WITH PROJECTED AVERAGE DAILY TRIPS OF 500 VEHICLES OR MORE SHALL BE CONSTRUCTED WITH PAVED SHOULDERS.

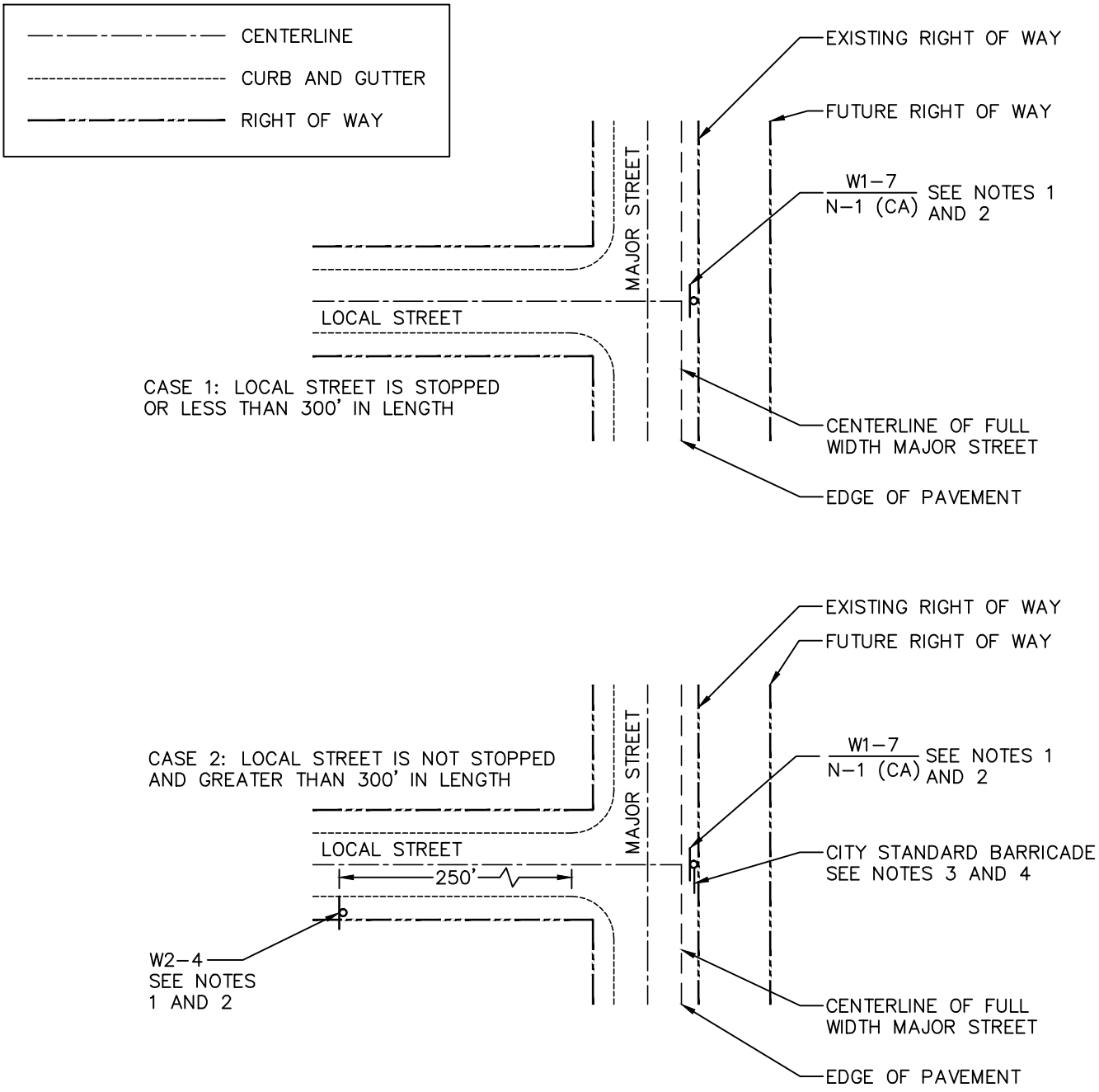
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

UNPAVED STREET & SHOULDER S.J.V.A.P.C.D. STANDARD REQUIREMENTS

REVISIONS
08/10/16
BK 2016

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NOTES:

1. ALL SIGNS ARE TO MEET CITY STANDARDS FOR RETROREFLECTIVITY, FACE SHEETING, SIGN GAUGE, POST TYPE, AND ANCHORING/FOOTING PROCEDURES.
2. SIGNS ARE TO BE INSTALLED A MINIMUM OF 4' BACK FROM EDGE OF PAVEMENT.
3. CITY STANDARD BARRICADE IS TO BE INSTALLED IF OBJECTS IN THE PATH OF ONCOMING TRAFFIC MAY FORM A HAZARD (I.E. ORCHARD, TREE STAND, EARTHWORK, BUILDING, ETC.).
4. IF REQUIRED, CITY STANDARD BARRICADE IS TO BE INSTALLED BETWEEN 4' AND 8' BACK FROM EDGE OF PAVEMENT, DEPENDENT ON SURROUNDING AREA.
5. ALL SIGNS ARE TO MEET THE LATEST CALIFORNIA MUTCD GUIDELINES.

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

"T" INTERSECTION TEMPORARY HALF STREET TREATMENTS

REVISIONS
08/11/16
BK 2016

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STREET SECTION REQUIREMENTS

APPROVED BY: _____ CITY ENGINEER

R.C.E. 7192

01/17/25 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

REVISIONS
01/17/25
BK 2016

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R-VALUE OF SUBGRADE	TRAFFIC INDEX (TI)																			
	5.5		6		6.5		7		7.5		8		9		10		11		12		13	
	HMA	AB	HMA	AB	HMA	AB	HMA	AB	HMA	AB	HMA	AB	HMA	AB	HMA	AB	HMA	AB	HMA	AB	HMA	AB
10	2.5"	12"	2.5"	14"	3"	15"	5"	13"	5"	15"	5"	16"	5.5"	19"	6"	22"	7.5"	23"	8"	26"	8.5"	30"
12	2.5"	12"	2.5"	14"	3"	15"	5"	12"	5"	14"	5"	16"	5.5"	19"	6"	21"	7.5"	23"	8"	25"	8.5"	29"
14	2.5"	12"	2.5"	13"	3"	14"	5"	12"	5"	14"	5"	15"	5.5"	18"	6"	21"	7.5"	22"	8"	24"	8.5"	28"
16	2.5"	11"	2.5"	13"	3"	14"	5"	11"	5"	13"	5"	15"	5.5"	17"	6"	20"	7.5"	21"	8"	23"	8.5"	27"
18	2.5"	11"	2.5"	12"	3"	13"	5"	11"	5"	13"	5"	14"	5.5"	17"	6"	19"	7.5"	20"	8"	23"	8.5"	26"
20	2.5"	11"	2.5"	12"	3"	13"	5"	10"	5"	12"	5"	14"	5.5"	16"	6"	19"	7.5"	20"	8"	22"	8.5"	25"
22	2.5"	10"	2.5"	11"	3"	12"	5"	10"	5"	12"	5"	13"	5.5"	15"	6"	18"	7.5"	19"	8"	21"	8.5"	24"
24	2.5"	10"	2.5"	11"	3"	12"	5"	9"	5"	11"	5"	12"	5.5"	15"	6"	17"	7.5"	18"	8"	20"	8.5"	24"
26	2.5"	9"	2.5"	11"	3"	11"	5"	9"	5"	11"	5"	12"	5.5"	14"	6"	16"	7.5"	17"	8"	19"	8.5"	23"
28	2.5"	9"	2.5"	10"	3"	11"	5"	8"	5"	10"	5"	11"	5.5"	14"	6"	16"	7.5"	16"	8"	19"	8.5"	22"
30	2.5"	9"	2.5"	10"	3"	10"	5"	8"	5"	10"	5"	11"	5.5"	13"	6"	15"	7.5"	16"	8"	18"	8.5"	21"
32	2.5"	8"	2.5"	9"	3"	10"	5"	7"	5"	9"	5"	10"	5.5"	12"	6"	14"	7.5"	15"	8"	17"	8.5"	20"
34	2.5"	8"	2.5"	9"	3"	10"	5"	7"	5"	9"	5"	10"	5.5"	12"	6"	14"	7.5"	14"	8"	16"	8.5"	19"
36	2.5"	7"	2.5"	9"	3"	9"	5"	7"	5"	8"	5"	9"	5.5"	11"	6"	13"	7.5"	13"	8"	15"	8.5"	18"
38	2.5"	7"	2.5"	8"	3"	9"	5"	7"	5"	8"	5"	9"	5.5"	10"	6"	12"	7.5"	13"	8"	15"	8.5"	17"
40	2.5"	7"	2.5"	7"	3"	8"	5"	7"	5"	7"	5"	8"	5.5"	10"	6"	12"	7.5"	12"	8"	14"	8.5"	16"
42	2.5"	7"	2.5"	7"	3"	8"	5"	7"	5"	7"	5"	8"	5.5"	10"	6"	11"	7.5"	12"	8"	13"	8.5"	15"
44	2.5"	7"	2.5"	7"	3"	8"	5"	7"	5"	7"	5"	8"	5.5"	10"	6"	11"	7.5"	12"	8"	12"	8.5"	14"

NOTES:

1. AB = CLASS 2 AGGREGATE BASE. HMA = HOT MIX ASPHALT. ALL AB AND HMA SHALL CONFORM WITH THE CITY OF VISALIA ENGINEERING STANDARD SPECIFICATIONS.

2. TRAFFIC INDEXES USED SHALL BE AS APPROVED BY THE CITY ENGINEER.

3. A CALIFORNIA R-VALUE REPORT SHALL BE SUBMITTED TO THE CITY ENGINEERING DEPARTMENT FOR REVIEW AND ACCEPTANCE. THIS REPORT SHALL BE STAMPED AND SIGNED BY A REGISTERED CIVIL ENGINEER FROM A CERTIFIED TESTING LABORATORY. THE REPORT SHALL INCLUDE THE TEST RESULTS, DATA SHEETS, AND SOIL CLASSIFICATION OF ALL R-VALUE TESTS AND A MAP THAT SHOWS THE LOCATION OF ALL TESTS TAKEN AND THE R-VALUES ON THE SITE. IN GENERAL R-VALUE TESTING SHALL BE PERFORMED AT 300' INTERVALS IN A ROADWAY UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER.

4. WHERE SUBGRADE R-VALUES ARE LESS THAN 30 A MODIFIED STREET SECTION MAY BE PROPOSED. ALL MODIFIED STREET SECTIONS MUST BE ACCOMPANIED BY A LETTER OF APPROVAL STAMPED AND SIGNED BY A REGISTERED CIVIL ENGINEER FROM A CERTIFIED TESTING LABORATORY. PROPOSALS SHALL BE REVIEWED BY THE CITY ENGINEER. THE CITY IS UNDER NO OBLIGATION TO ACCEPT ANY MODIFIED STREET SECTION PROPOSALS.

5. STREET SECTION REQUIREMENTS SHOWN ON THIS DETAIL SUPERCEDE STREET SECTIONS SHOWN ON ALL OTHER PAVEMENT SECTION DETAILS.

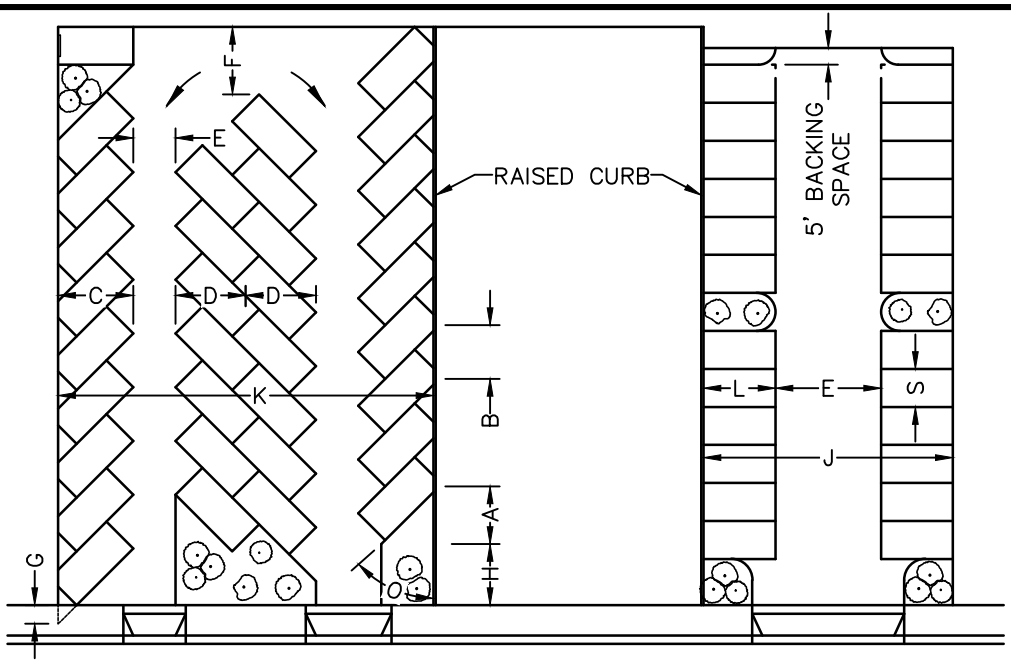


TABLE OF DIMENSIONS IN FEET

O	S	L	A	B	C	D	E	F	G	H	J	K
0°	8.0	22.0	0.0	22.0	8.0	8.0	12.0		0.0	5.0	28.0	
	8.0	24.0	0.0	24.0	8.0	8.0	11.0		0.0	5.0	27.0	
	8.0	26.0	0.0	26.0	8.0	8.0	10.0		0.0	5.0	26.0	
30°	8.5	19.0	29.2	17.0	16.9	13.2	10.0		12.8	6.0	43.8	
	9.0	19.0	30.0	18.0	17.3	13.4	9.0		13.5	6.0	43.6	
45°	8.5	19.0	19.4	12.0	19.4	16.4	10.8	15.5	6.0	9.5	49.6	93.2
	9.0	19.0	19.8	12.7	19.8	16.6	10.0	16.0	6.4	9.0	49.6	92.8
	9.5	19.0	20.1	13.4	20.1	16.7	9.5	16.5	6.7	8.5	49.7	92.6
	10.0	19.0	20.5	14.1	20.4	16.9	9.0	17.0	7.0	8.0	49.8	92.6
60°	8.5	19.0	12.0	9.8	20.8	18.7	18.0		2.5	12.5	59.6	115.0
	9.0	19.0	12.1	10.4	21.0	18.8	17.0	15.0	2.6	12.0	59.0	113.6
	9.5	19.0	12.3	11.0	21.3	18.9	15.5	15.0	2.8	11.5	58.1	111.4
	10.0	19.0	12.4	11.5	21.5	19.0	14.0	15.0	2.9	11.0	57.0	109.0
COMPACT 90°	7.5	15.0	0.0	7.5	15.0	15.0	24.0	20.0	0.0	5.0	54.0	108.0
	8.5	19.0	0.0	8.5	19.0	19.0	27.0	20.0	0.0	5.0	65.0	130.0
	9.0	19.0	0.0	9.0	19.0	19.0	25.0	20.0	0.0	5.0	63.0	126.0
	9.5	19.0	0.0	9.5	19.0	19.0	24.0	20.0	0.0	5.0	62.0	124.0
	10.0	19.0	0.0	10.0	19.0	19.0	23.0	20.0	0.0	5.0	61.0	122.0

NOTES:

1. PARKING LOT STRUCTURAL SECTION SHALL CONSIST OF 2" ASPHALT CONCRETE OVER 4" AGGREGATE BASE, CLASS 2, OVER 6" MINIMUM OF SUB-BASE COMPACTED TO 95% RELATIVE COMPACTION. DESIGN STRUCTURAL PAVING SECTION TO TRAFFIC INDEX OF 5.5 MINIMUM FOR SOLID WASTE TRUCK TRAVEL PATH. CITY PARKING LOT PAVEMENT SHALL BE DESIGNED PER STREET SECTION REQUIREMENTS STANDARD DRAWING.
2. MINIMUM SLOPE OF ASPHALT CONCRETE SURFACE SHALL BE 1%.
3. A LANDSCAPED ISLAND SHALL BE INSTALLED EVERY 10 SPACES.
4. MINIMUM AMOUNT OF LANDSCAPED AREA SHALL BE 5% TOTAL AREA.
5. ACCESSIBLE ROUTES SHALL BE PROVIDED TO THE CITY STREET RIGHT OF WAY, TO BUILDINGS, AND FACILITY ARRIVAL POINTS.
6. PARKING STALL LENGTH (L) CAN BE REDUCED BY 2 FT WHERE VEHICLES HAVE SPACE TO OVER HANG BY 2 FT WHILE MAINTAINING AN ACCESSIBLE ROUTE.

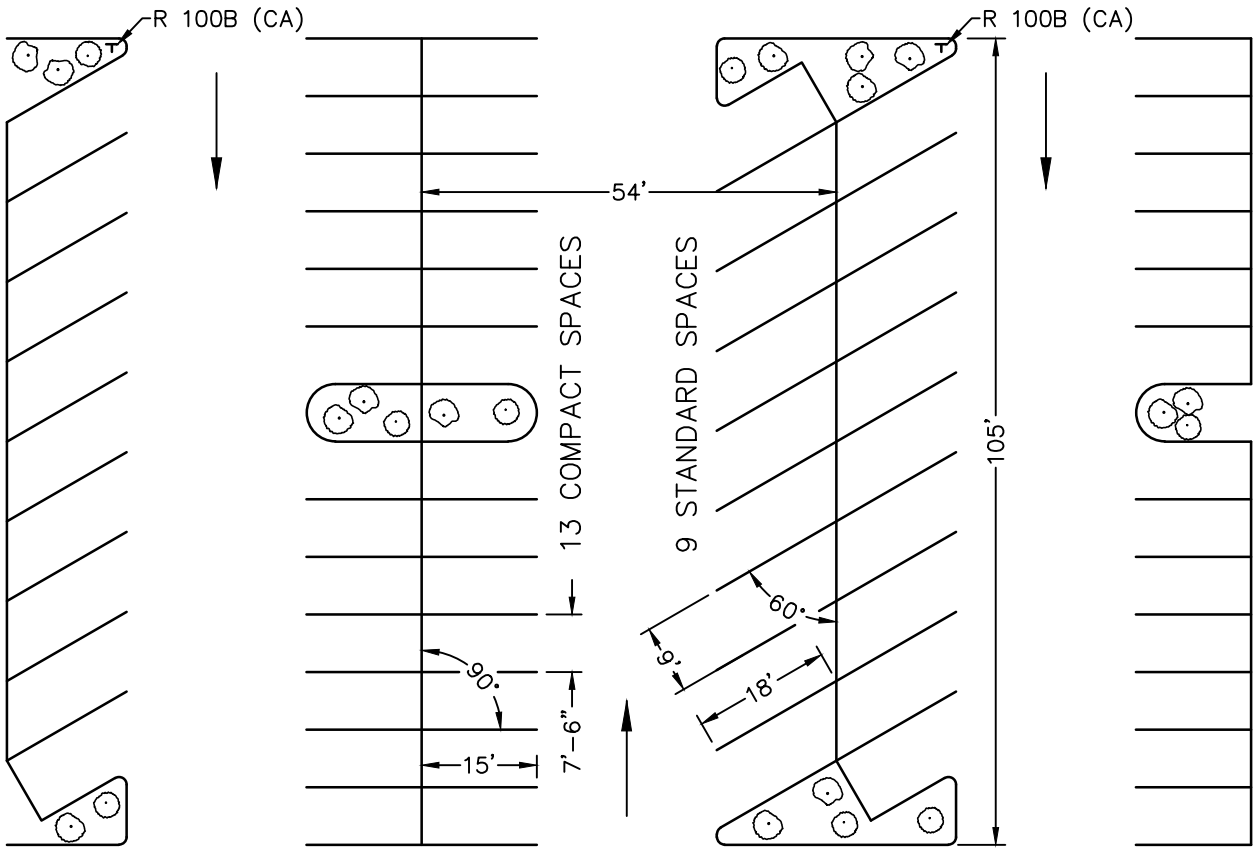
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

PARKING STANDARDS

REVISIONS
08/11/16
BK 2016

PK-1



BASIC CONCEPT

THE DRACHMAN SYSTEM USES 90 DEGREE ANGLE SPACES FOR SMALL CARS IN THE SAME BAY IN WHICH 45 OR 60 DEGREE ANGLE SPACES ARE PROVIDED FOR LARGE CARS. THIS SELF ENFORCING PLAN USES STANDARD SPACE STALLS 8.5 OR 9.0 FEET WIDE BY 18 FEET LONG, WHILE COMPACT SPACES ARE 7.5 FEET WIDE BY 15 FEET LONG WITHIN A BAY WIDTH OF 54 FEET.

COMPARISON OF DRACHMAN SYSTEM TO STANDARD SYSTEM

DRACHMAN SYSTEM	
STANDARD SPACES	9
COMPACT SPACES	13
TOTAL	
STANDARD SYSTEM	
STANDARD SPACES	18
INCREASE IN SPACES DRACHMAN OVER STANDARD PERCENTAGE	22%

NOTES:

1. PARKING LOT STRUCTURAL SECTION SHALL CONSIST OF 2" ASPHALT CONCRETE OVER 4" AGGREGATE BASE, CLASS 2, OVER 6" MINIMUM OF SUB-BASE COMPACTED TO 95% RELATIVE COMPACTION. DESIGN STRUCTURAL PAVING SECTION TO TRAFFIC INDEX OF 5.5 MINIMUM FOR SOLID WASTE TRUCK TRAVEL PATH. CITY PARKING LOT PAVEMENT SHALL BE DESIGNED PER STREET SECTION REQUIREMENTS STANDARD DRAWING.
2. MINIMUM SLOPE OF ASPHALT CONCRETE SURFACE SHALL BE 1%.
3. A LANDSCAPED ISLAND SHALL BE INSTALLED EVERY 10 SPACES.
4. MINIMUM AMOUNT OF LANDSCAPED AREA SHALL BE 5% TOTAL AREA.
5. CITY ORDINANCE ALLOWS A MAXIMUM OF 30% COMPACT PARKING SPACES WITHIN A PARKING LOT, UNLESS EXTRA SPACES ARE PROVIDED.

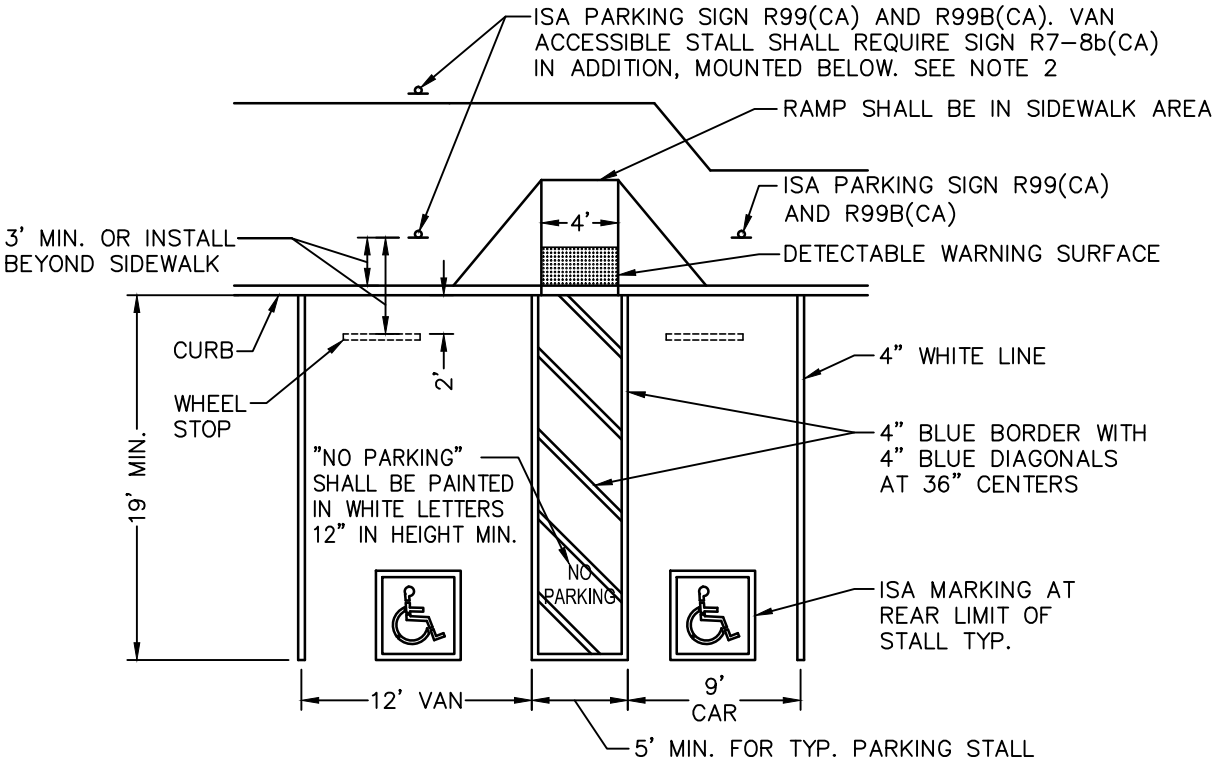
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

PARKING STANDARD DRACHMAN SYSTEM

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BK 2016

PK-2

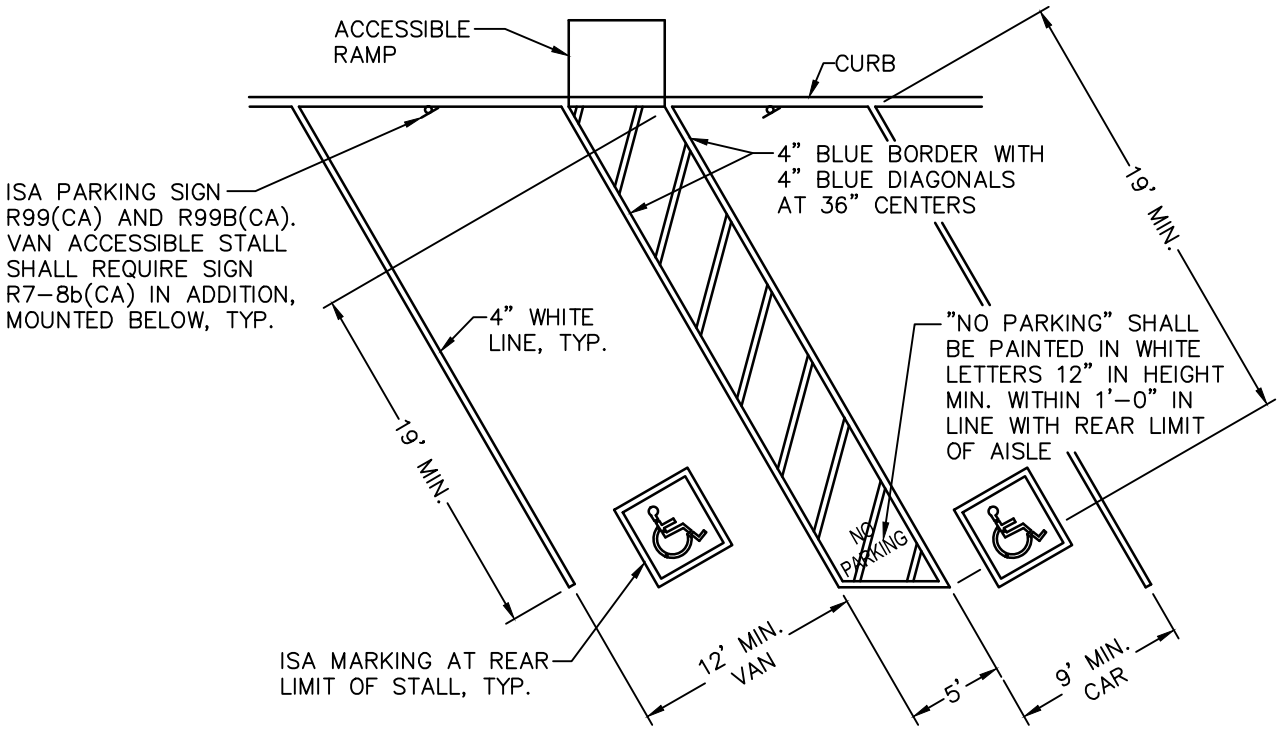


TYPICAL CONFIGURATION

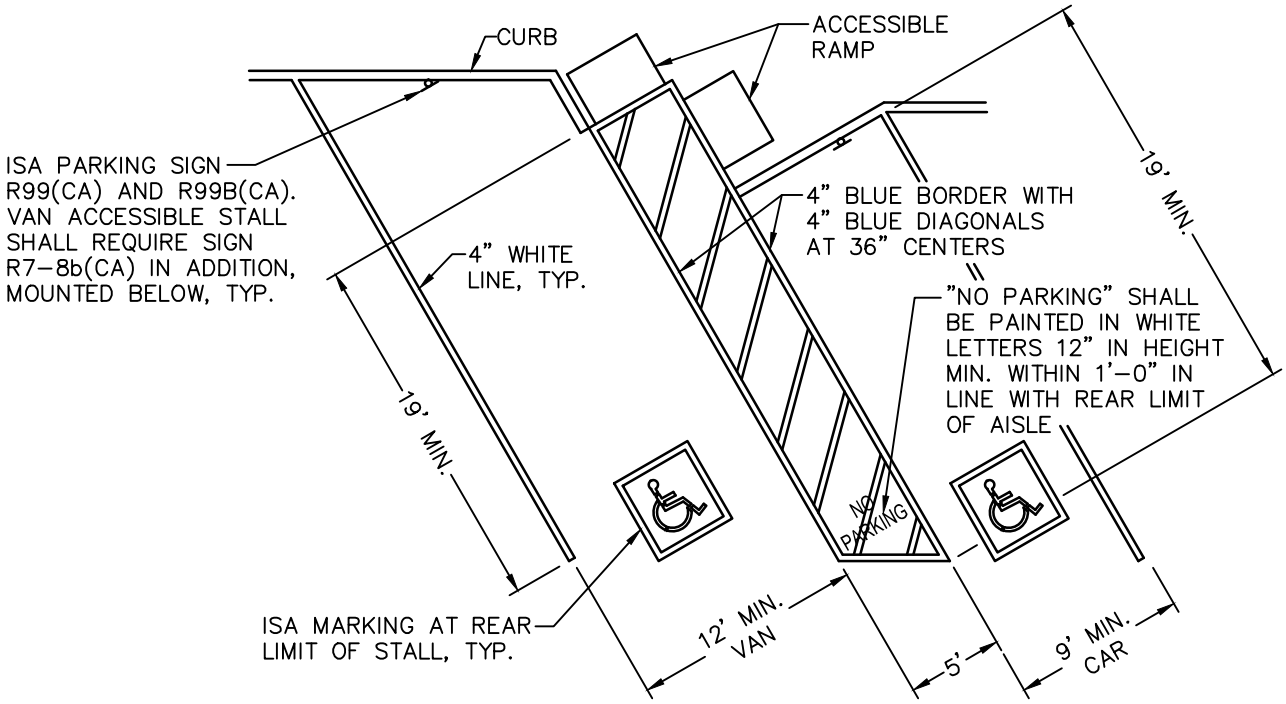
NOTE:

1. SEE PARKING STANDARDS AND PARKING STANDARDS DRACHMAN SYSTEM FOR REQUIRED LENGTH OF STALLS.
2. A R99C(CA) SIGN CAN BE USED IN PLACE OF THE R99(CA) AND R99B(CA) SIGNS.
3. A MAX SLOPE OF 1.5% IN ALL DIRECTIONS ON ACCESSIBLE PARKING STALLS AND AISLES.
4. ACCESSIBLE PARKING STALLS SHALL BE LOCATED AS CLOSE AS POSSIBLE, AND ON THE SHORTEST ACCESSIBLE ROUTE OF TRAVEL, TO THE PEDESTRIAN ENTRANCE OF THE SITE.
5. ACCESSIBLE PARKING STALLS SHALL BE SO LOCATED THAT USERS ARE NOT COMPELLED TO WHEEL OR WALK BEHIND PARKED CARS OTHER THAN THEIR OWN.
6. ONE IN EVERY SIX ACCESSIBLE PARKING STALLS, BUT NOT LESS THAN ONE, SHALL BE VAN ACCESSIBLE. VAN ACCESSIBLE PARKING STALLS SHALL HAVE AN ACCESS AISLE 5' MINIMUM IN WIDTH, PLACED ON THE SIDE OPPOSITE OF THE DRIVER'S SIDE OF THE VEHICLE.
7. RAMPS SHALL NOT ENCROACH INTO ANY ACCESSIBLE PARKING STALL OR ACCESS AISLE.
8. WHERE R99(CA) AND R99B(CA) SIGNS ARE INSTALLED ON SIDEWALKS OR OTHER PATHS OF TRAVEL, THE BOTTOM OF SIGN PANEL SHALL BE A MINIMUM OF 7' ABOVE THE SURFACE OF THE SIDEWALK OR PATH. WHERE R99(CA) AND R99B(CA) SIGNS ARE NOT INSTALLED ON SIDEWALKS OR PATHS OF TRAVEL, THE BOTTOM OF THE SIGN PANEL SHALL BE AT LEAST 5' ABOVE THE SURFACE OF THE PARKING LOT.
9. WHERE THERE IS A CLUSTER OF ACCESSIBLE PARKING STALLS, THE VAN ACCESSIBLE PARKING STALL SHALL BE FURTHEST FROM THE ACCESSIBLE FACILITY ENTRANCE, WITHIN SUCH CLUSTER OF ACCESSIBLE PARKING STALLS.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
ACCESSIBLE PARKING 1 OF 3	REVISIONS 09/01/16 BK 2016 — PK-3



TYPICAL CONFIGURATION



TYPICAL CONFIGURATION

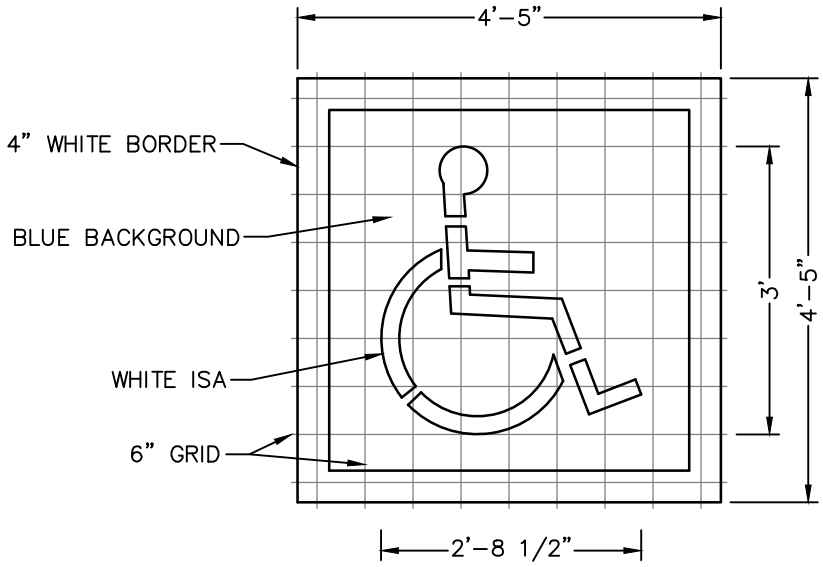
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ACCESSIBLE PARKING 2 OF 3

REVISIONS
08/12/16
BK 2016

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ISA MARKING FOR ACCESSIBLE PARKING SPACE OR STALL

TOTAL NUMBER OF PARKING SPACES OR STALLS	MINIMUM NUMBER OF DISABLED ACCESSIBLE PARKING SPACES OR STALLS
1–25	1
26–50	2
51–75	3
76–100	4
101–150	5
151–200	6
201–300	7
301–400	8
401–500	9
501–1000	2 PERCENT OF TOTAL
GREATER THAN 1001	20 PLUS 1 FOR EACH 100 OR FRACTION THEREOF OVER 1000

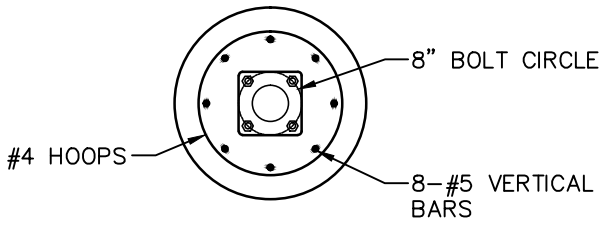
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

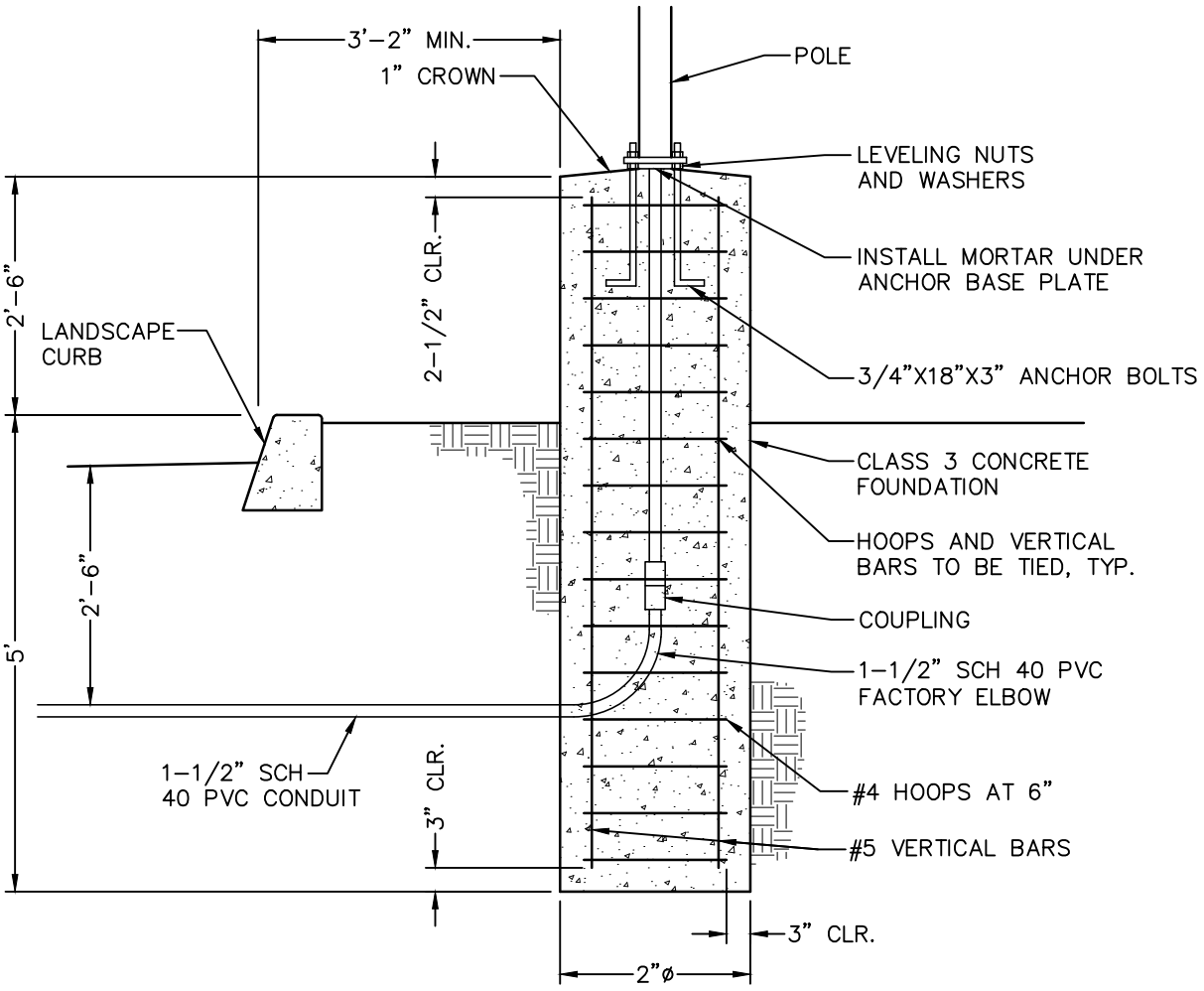
ACCESSIBLE PARKING 3 OF 3

REVISIONS
08/12/16
BK 2016

PK–5



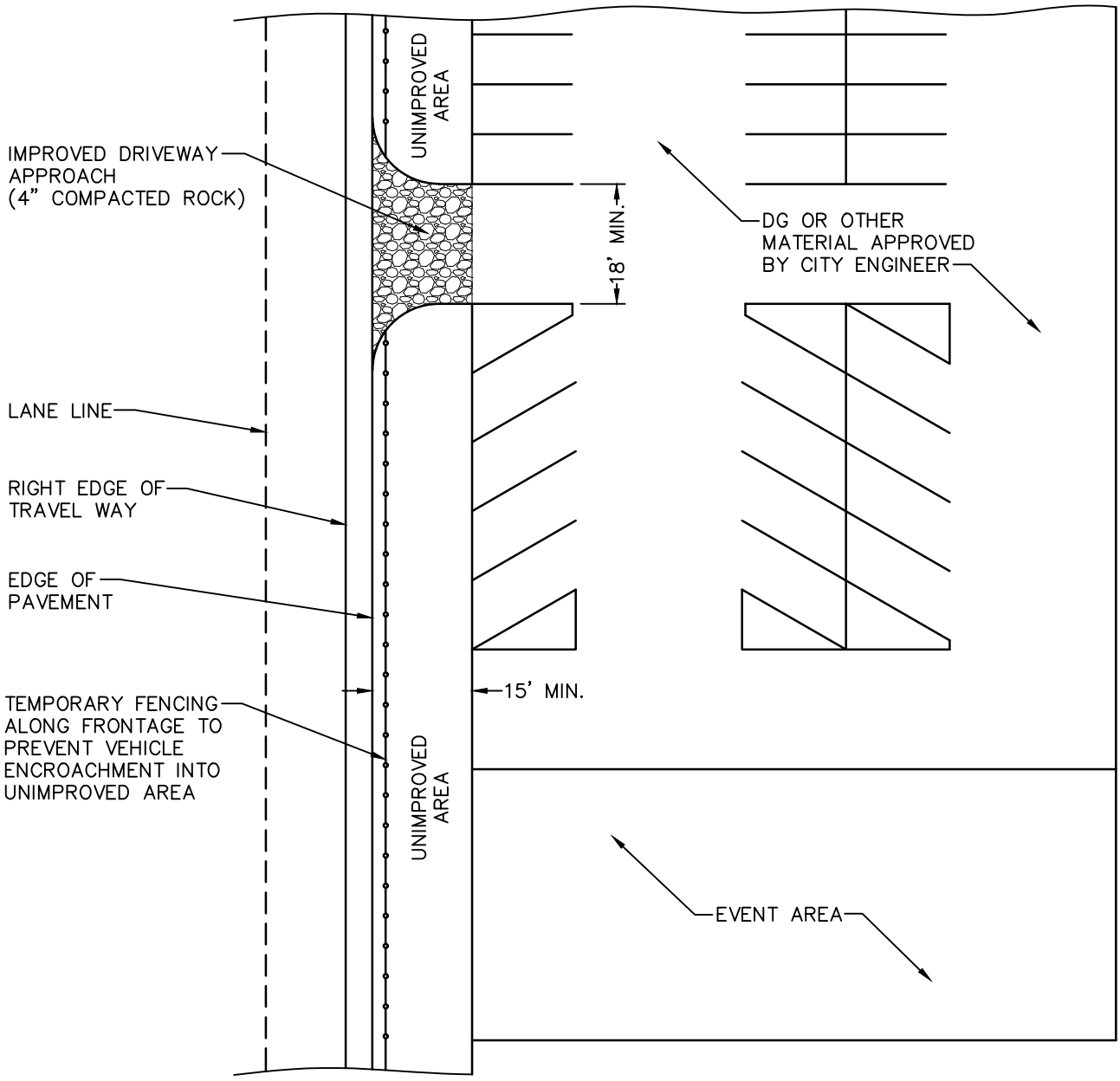
PLAN



NOTES:

1. POLES SHALL BE 25'–0" ROUND STRAIGHT STEEL, LITHONIA RSS 25 4B OR APPROVED EQUAL.
2. LIGHTING SHALL BE LITHONIA KAD R5S 400W HIGH PRESSURE SODIUM OR APPROVED EQUAL MOUNTED WITH A 4" MAST ARM.
3. ALL POLES, MAST ARMS AND LIGHTING SHALL BE MEDIUM BRONZE IN COLOR.

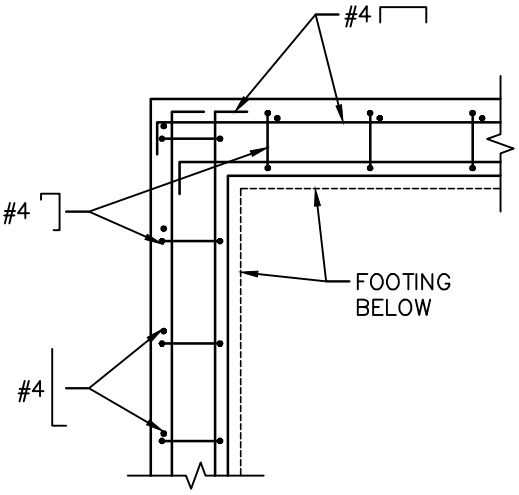
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CITY PARKING LOT LIGHTING	REVISIONS 08/12/16 BK 2016	PK–6



NOTES:

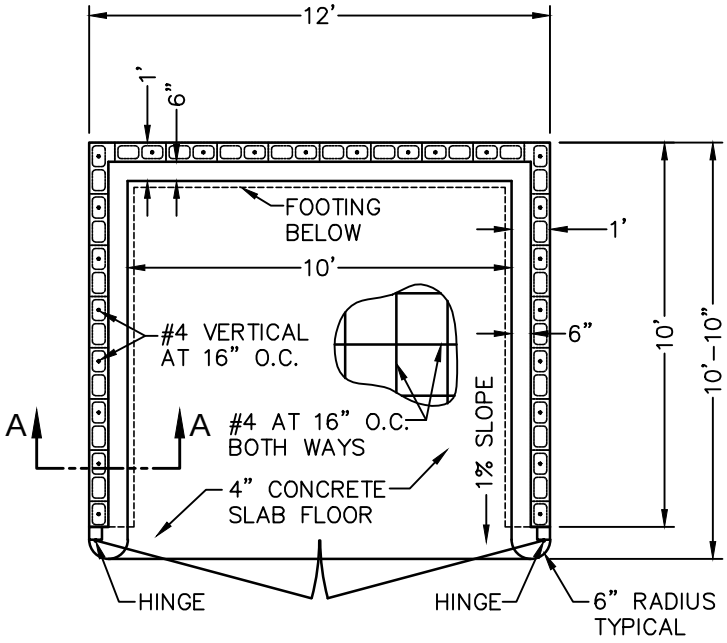
1. APPLICABLE TO TEMPORARY PARKING LOTS FOR TEMPORARY FUNCTIONS SUCH AS CARNIVALS, CHRISTMAS TREE LOTS, PUMPKIN PATCHES AND SIMILAR EVENTS WITH APPROVAL OF CITY ENGINEER.
2. TEMPORARY PARKING LOT REQUIRES A TEMPORARY CONDITIONAL USE PERMIT (TCUP). APPLICANT IS RESPONSIBLE FOR ALL TRACK-OUT DAILY. TEMPORARY PARKING SHALL BE LIMITED TO 3 MONTHS MAX.
3. SEE OTHER PARKING DETAILS FOR DIMENSIONS AND OTHER REQUIREMENTS.
4. NOT APPLICABLE FOR PERMANENT FACILITIES WITH TEMPORARY PARKING USE SUCH AS STORAGE FACILITIES, INDUSTRIAL PARKING LOTS, GARAGE SHOPS, ETC.
5. APPLICANT IS RESPONSIBLE FOR ON-SITE DRAINAGE.

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TEMPORARY PARKING LOT STANDARDS	REVISIONS 08/12/16 BK 2016 — PK-7

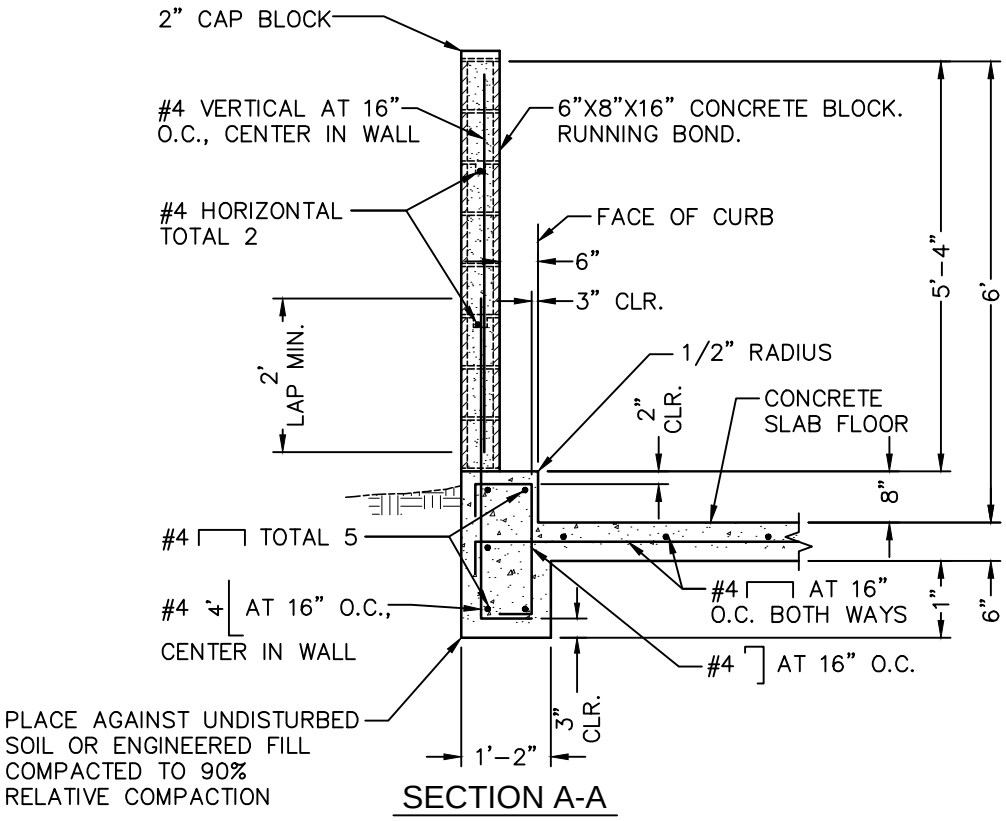


CURB CORNER DETAIL

FOOTING CORNER DETAIL SIMILAR



PLAN



SECTION A-A

NOTE:

FOR ALL APPLICABLE NOTES, SEE REFUSE CONTAINER ENCLOSURE NOTES STANDARD DRAWING.

APPROVED BY: _____ 09/16/16

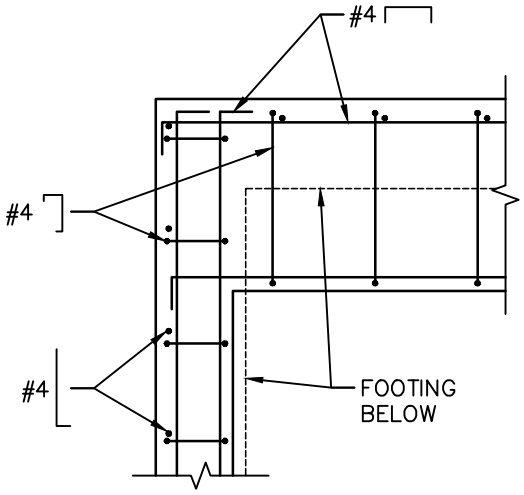
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

12' REFUSE CONTAINER ENCLOSURE

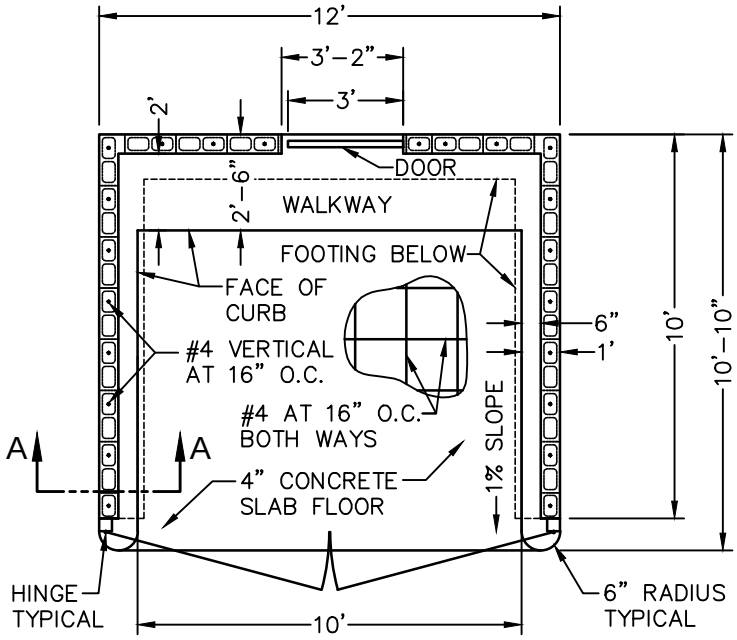
REVISIONS
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R-1

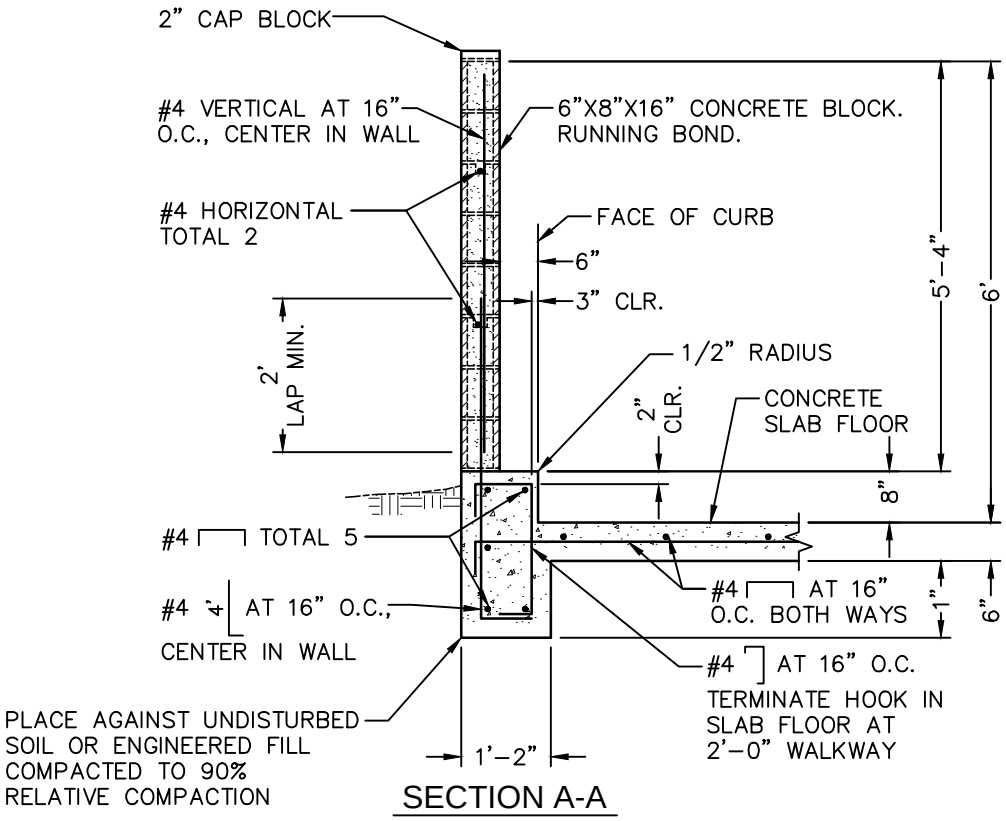


CURB CORNER DETAIL

FOOTING CORNER DETAIL SIMILAR



PLAN



SECTION A-A

NOTE:

FOR ALL APPLICABLE NOTES, SEE REFUSE CONTAINER ENCLOSURE NOTES STANDARD DRAWING.

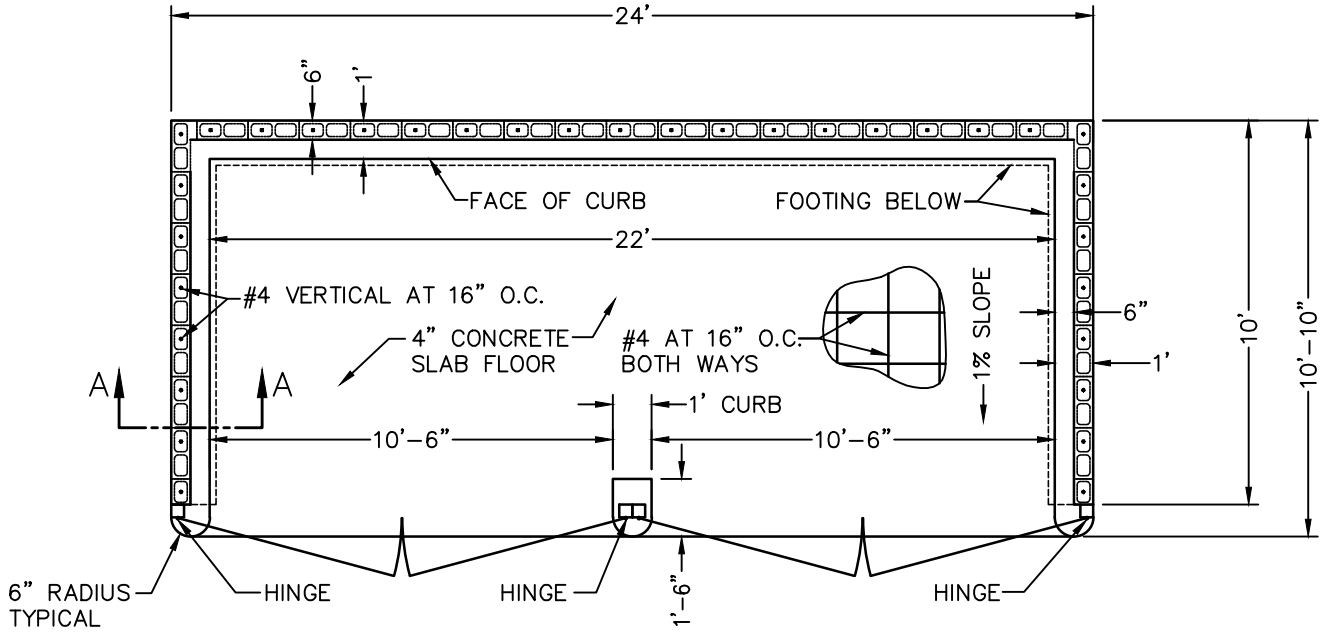
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

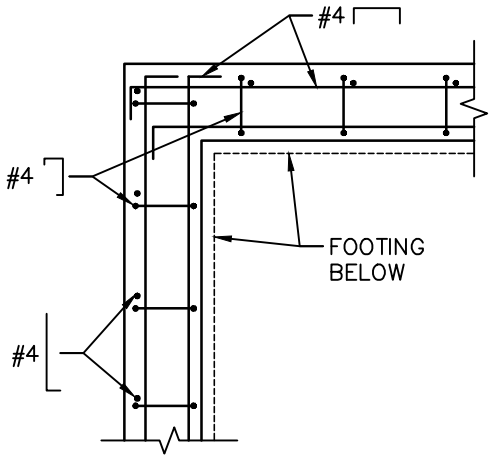
12' REFUSE CONTAINER ENCLOSURE – WITH DOOR

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R–2



PLAN

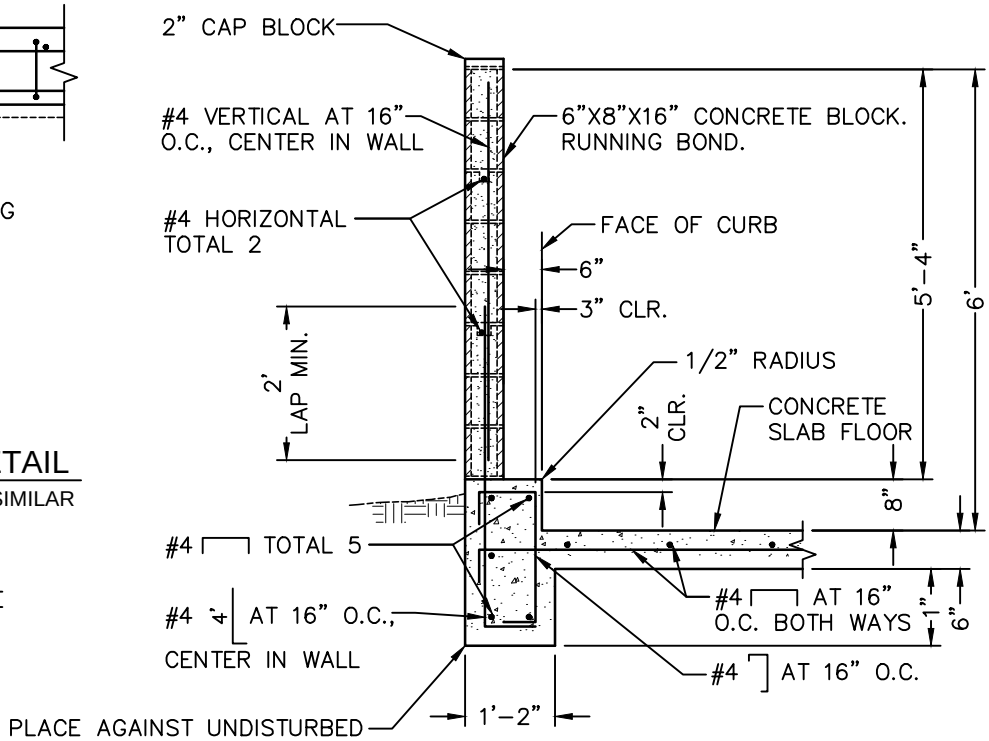


CURB CORNER DETAIL

FOOTING CORNER DETAIL SIMILAR

NOTE:

FOR ALL APPLICABLE NOTES, SEE REFUSE CONTAINER ENCLOSURE NOTES STANDARD DRAWING.



SECTION A-A

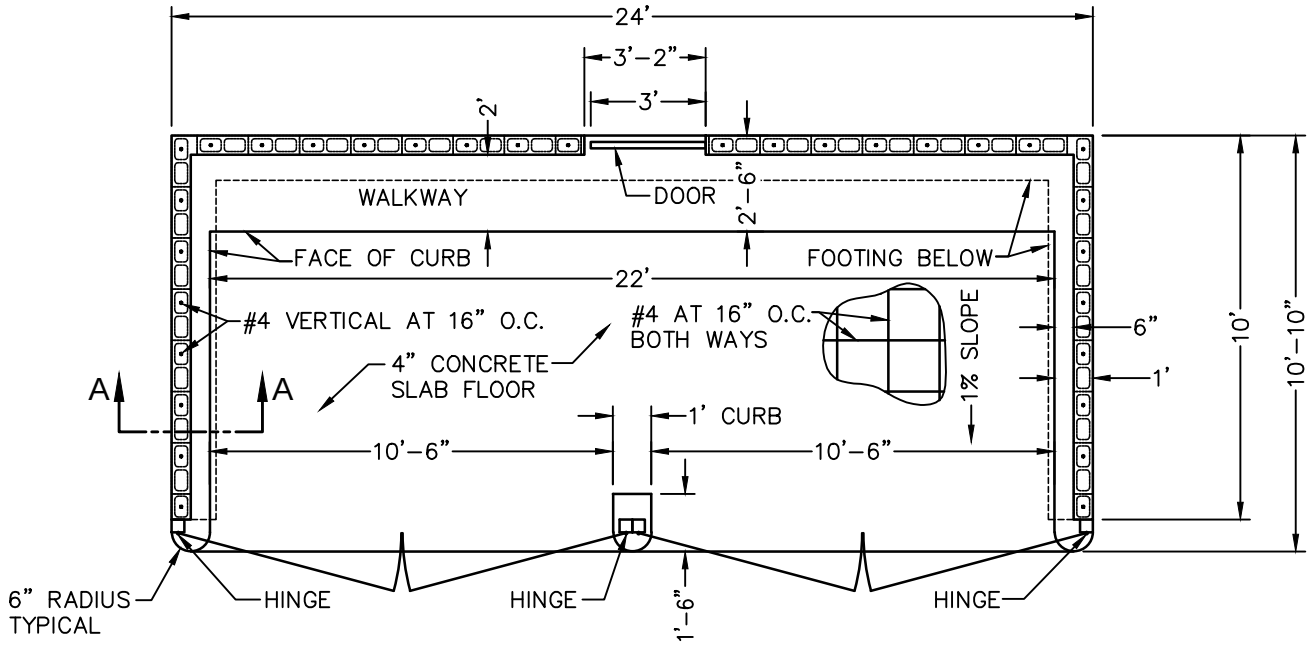
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

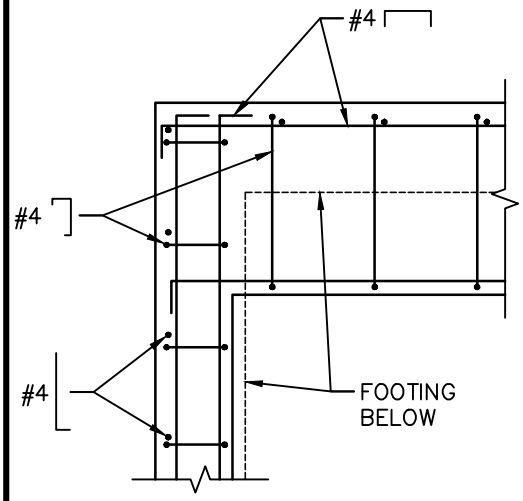
24' REFUSE CONTAINER ENCLOSURE

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BK 2016

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PLAN

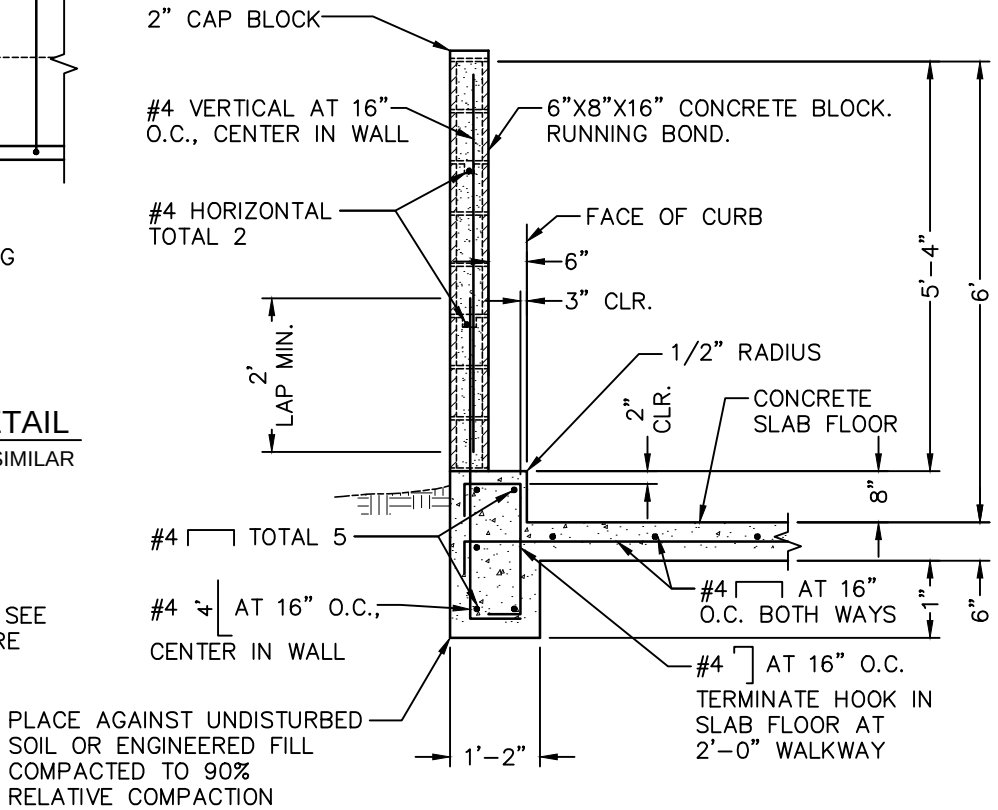


CURB CORNER DETAIL

FOOTING CORNER DETAIL SIMILAR

NOTE:

FOR ALL APPLICABLE NOTES, SEE REFUSE CONTAINER ENCLOSURE NOTES STANDARD DRAWING.



SECTION A-A

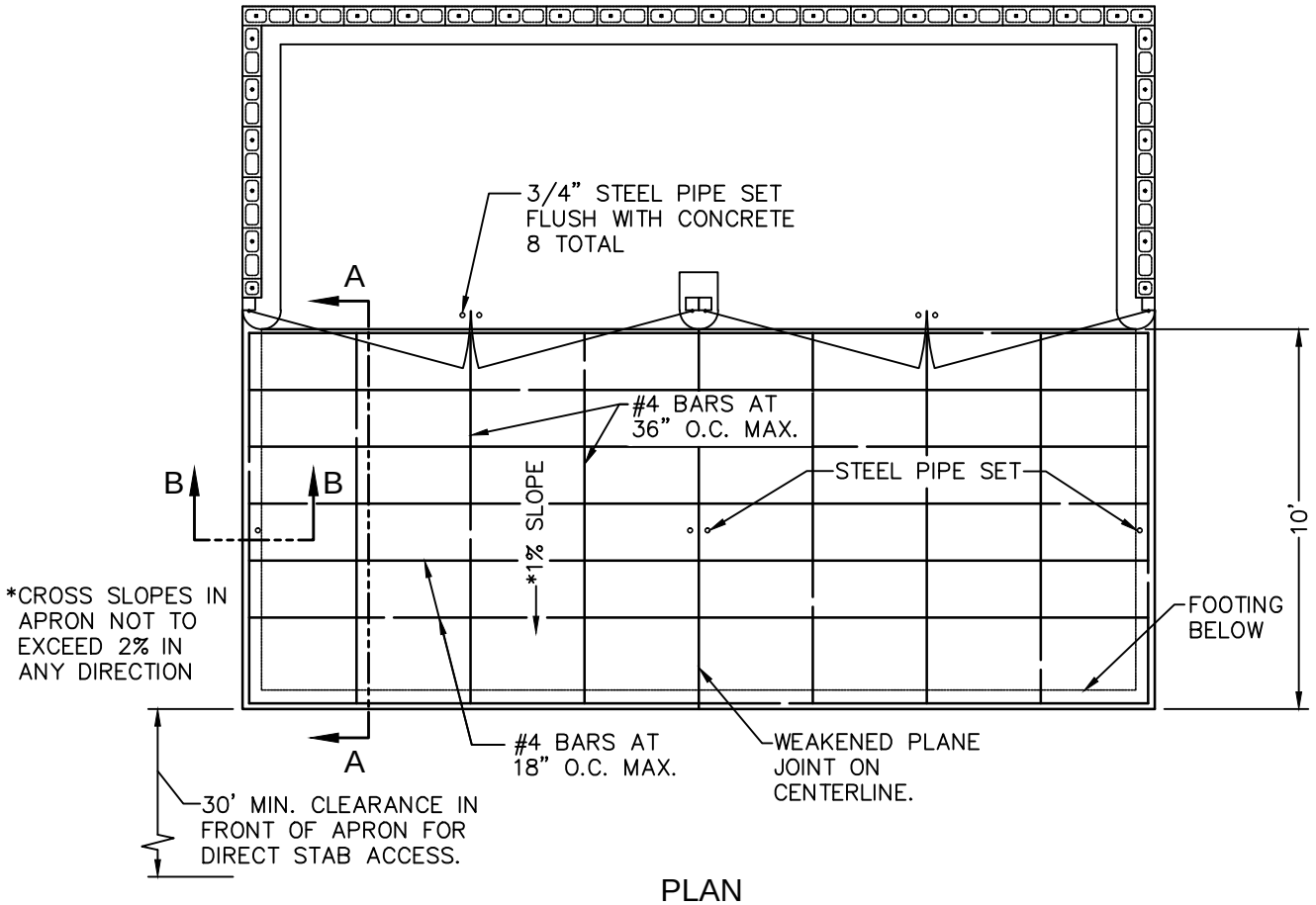
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

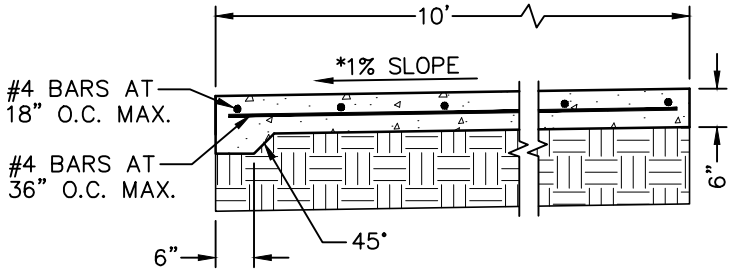
24' REFUSE CONTAINER ENCLOSURE – WITH DOOR

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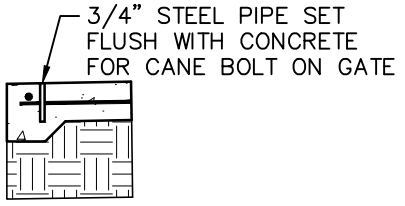
R–4



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS 3, PRE-MIXED. 28-DAY COMPRESSIVE STRENGTH = 2500 psi MIN.
2. REINFORCING BARS SHALL BE ASTM A615 GRADE 40 MINIMUM DEFORMED STEEL AND SHALL BE CLEAN OF DIRT AND RUST BEFORE PLACEMENT.
3. REINFORCING BARS SHALL HAVE A MINIMUM OF 3" OF CLEAR COVERAGE FROM THE COMPACTED EARTH AND 2" FROM FINISH GRADE.
4. ALL REFUSE CONTAINER ENCLOSURES SHALL HAVE A CONCRETE APRON.
5. CONCRETE PAD SHALL BE PLACED ON MOIST AND COMPACTED BASE MATERIALS. 95% RELATIVE COMPACTION.
6. STEEL PIPE LOCATION IN CONCRETE PAD SHALL BE DETERMINED BY CANE BOLT LOCATION ON GATE. SEE REFUSE CONTAINER ENCLOSURE GATE DETAILS STANDARD DRAWING.

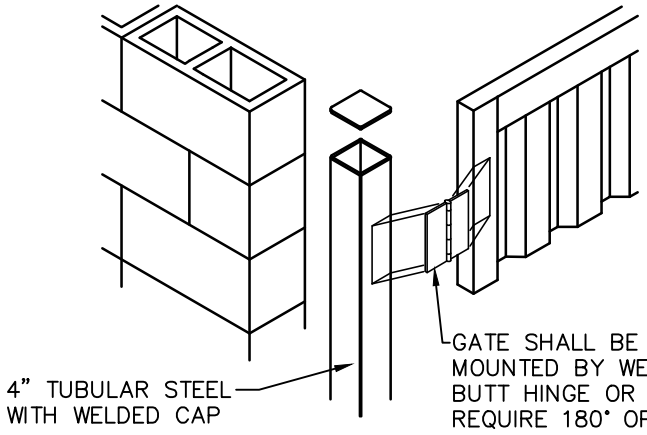
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

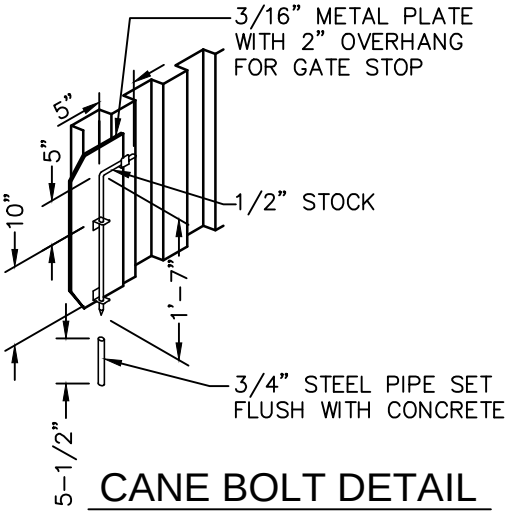
REFUSE CONTAINER ENCLOSURE CONCRETE APRON DETAILS

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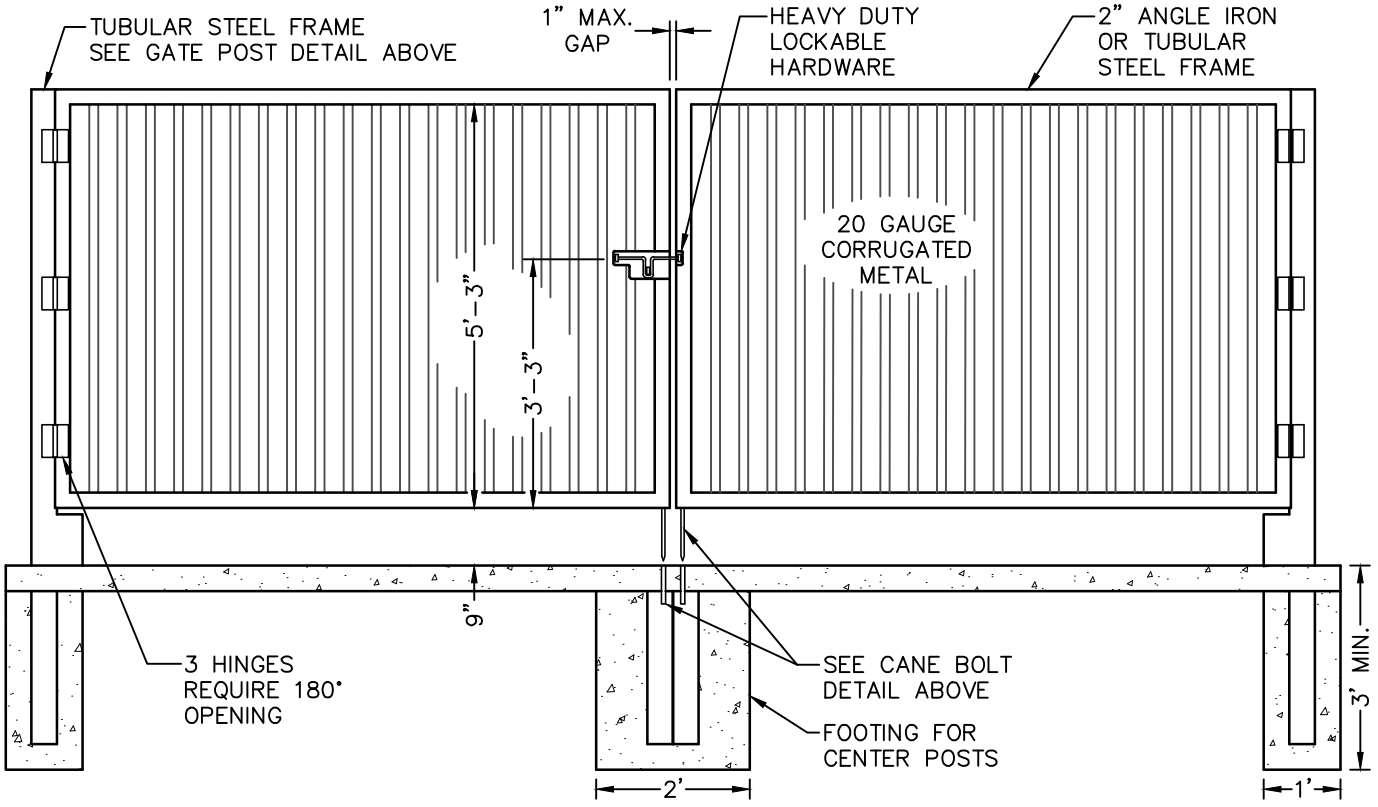
GATE POST DETAIL



CANE BOLT DETAIL

NOTES:

1. GATES TO BE PAINTED TO MATCH BUILDING ACCENT FEATURES.
2. DESIGN, ENGINEERING AND CONSTRUCTION NOT SPECIFICALLY NOTED SHALL BE IN ACCORDANCE WITH ACCEPTED INDUSTRY STANDARDS & OF FIRST QUALITY.
3. CONCRETE APRON SHALL INCLUDE TWO 3/4" STEEL PIPES SET FLUSH WITH THE CONCRETE FOR EACH GATE DOOR, BASED ON LOCATION OF CANE BOLTS ON GATE, TO SECURE THE GATE IN THE OPEN OR CLOSED POSITION. SEE REFUSE CONTAINER ENCLOSURE CONCRETE APRON DETAILS STANDARD DRAWING.
4. GATE POST SHALL ABUT REFUSE CONTAINER ENCLOSURE.
5. SUBMIT DETAILS OF REFUSE CONTAINER ENCLOSURES AND/OR REFUSE CONTAINERS REQUIRED TO BE ACCESSIBLE UNDER THE CURRENT CBC, OR MODIFY THIS DETAIL AS NECESSARY FOR REVIEW AND ACCEPTANCE FROM THE CITY ENGINEER.



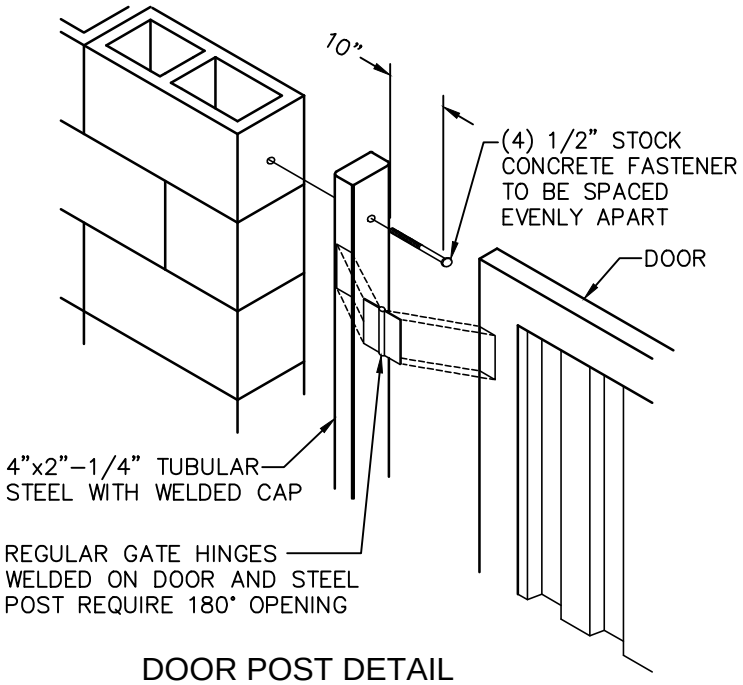
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

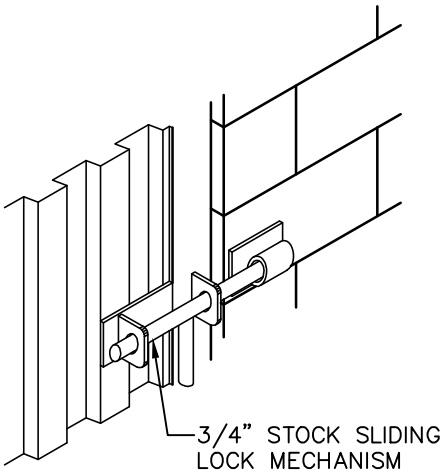
REFUSE CONTAINER ENCLOSURE GATE DETAILS

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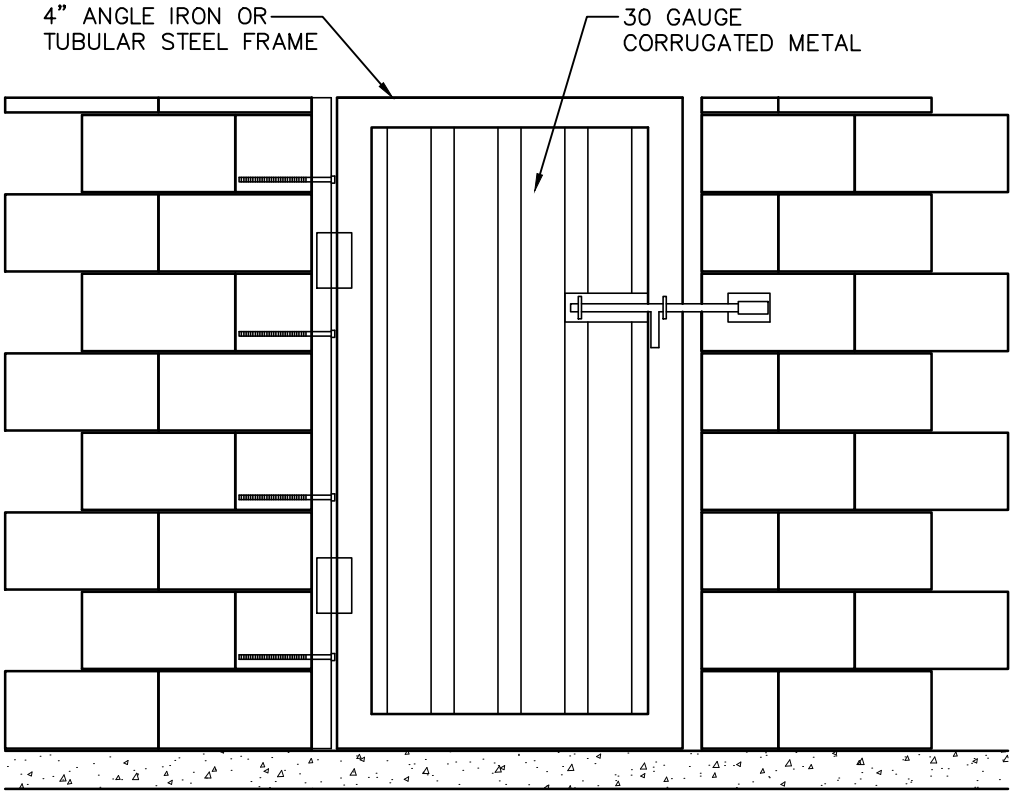
DOOR POST DETAIL



LOCKABLE HARDWARE DETAIL

NOTE:

1. SUBMIT DETAILS OF REFUSE CONTAINER ENCLOSURES AND/OR REFUSE CONTAINERS REQUIRED TO BE ACCESSIBLE UNDER THE CURRENT CBC, OR MODIFY THIS DETAIL AS NECESSARY FOR REVIEW AND ACCEPTANCE FROM THE CITY ENGINEER.



APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

REFUSE CONTAINER ENCLOSURE DOOR DETAILS

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NOTES:

1. MASONRY ENCLOSURE WALLS SHALL BE FULLY GROUTED.
2. ALL MASONRY SHALL COMPLY WITH CURRENT EDITION OF THE CALIFORNIA BUILDING CODE.
3. SLAB FLOOR AND FOOTING CONCRETE SHALL BE CLASS 3, PRE-MIXED. 28-DAY COMPRESSIVE STRENGTH = 2500 P.S.I MINIMUM.
4. MASONRY DESIGN IS BASED ON MINIMUM COMPRESSIVE STRENGTH OF f'm = 1500 P.S.I.
5. REINFORCING BARS SHALL BE ASTM A615 GRADE 40 DEFORMED STEEL AND SHALL BE CLEAN OF DIRT AND RUST BEFORE PLACEMENT.
6. GROUT SHALL CONFORM TO THE REQUIREMENTS OF ASTM C476 AND ATTAIN A 28-DAY STRENGTH OF 2000 P.S.I. ADMIXTURES FOR GROUT MUST BE APPROVED BY THE ENGINEER. FIELD ADDITION OF ADMIXTURES IS NOT PERMITTED IN SELF-CONSOLIDATING GROUT.
7. GROUT STOP SHALL CONSIST OF METAL OR PLASTIC LATH APPROVED BY THE MANUFACTURER TO CREATE A BARRIER THAT STOPS THE FLOW OF GROUT WHEN FILLING BLOCK WALL CELLS.
8. REFUSE CONTAINER ENCLOSURE SHALL BE LOCATED A MINIMUM OF 5'-0" FROM ANY BUILDING WALL LINE. OTHERWISE ENCLOSURE MUST COMPLY WITH STRICTER REQUIREMENTS PER THE CALIFORNIA FIRE CODE.
9. ALL HORIZONTAL AND VERTICAL JOINTS SHALL HAVE A CONCAVE FINISH JOINT.
10. GROUND SHALL BE SLOPED AWAY FROM ENCLOSURE WALLS.
11. REFUSE CONTAINER ENCLOSURE SHALL HAVE SOLID FACE GATES.
12. LOCATION OF REFUSE CONTAINER ENCLOSURE SHALL BE APPROVED BY THE CITY OF VISALIA SOLID WASTE DIVISION.
13. ALL REFUSE CONTAINER ENCLOSURES SHALL HAVE A CONCRETE APRON PER REFUSE CONTAINER ENCLOSURE CONCRETE APRON DETAILS STANDARD DRAWING.
14. SUBMIT DETAILS OF REFUSE CONTAINER ENCLOSURES AND/OR REFUSE CONTAINERS REQUIRED TO BE ACCESSIBLE UNDER THE CURRENT CBC, OR MODIFY THIS DETAIL AS NECESSARY FOR REVIEW AND ACCEPTANCE FROM THE CITY ENGINEER.
15. WHERE REQUIRED, PROVIDE ACCESSIBLE TRASH CONTAINERS MEETING THE ACCESSIBILITY REQUIREMENTS UNDER THE CURRENT CBC. COORDINATE WITH SOLID WASTE DIVISION FOR SERVICEABILITY.
16. CONTRACTOR SUBMITTALS SHALL CONFORM TO ARTICLE 1.5 OF TMS 602/ACI 530.1/ASCE 6.
17. QUALITY ASSURANCE SHALL CONFORM TO LEVEL 'B' QUALITY ASSURANCE PER ARTICLE 1.6 OF TMS 602/ACI 530.1/ASCE 6. PERIODIC SPECIAL INSPECTION REQUIRED. CONTRACTOR SHALL CONTACT THE CITY FOR INSPECTIONS.
18. INTERLOCKING BLOCKS ARE AN ACCEPTABLE ALTERNATIVE.

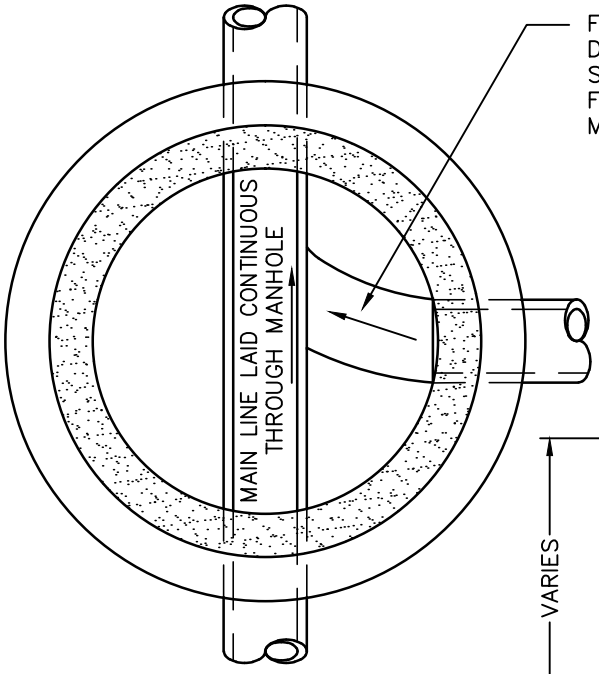
APPROVED BY:  09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

REFUSE CONTAINER ENCLOSURE NOTES

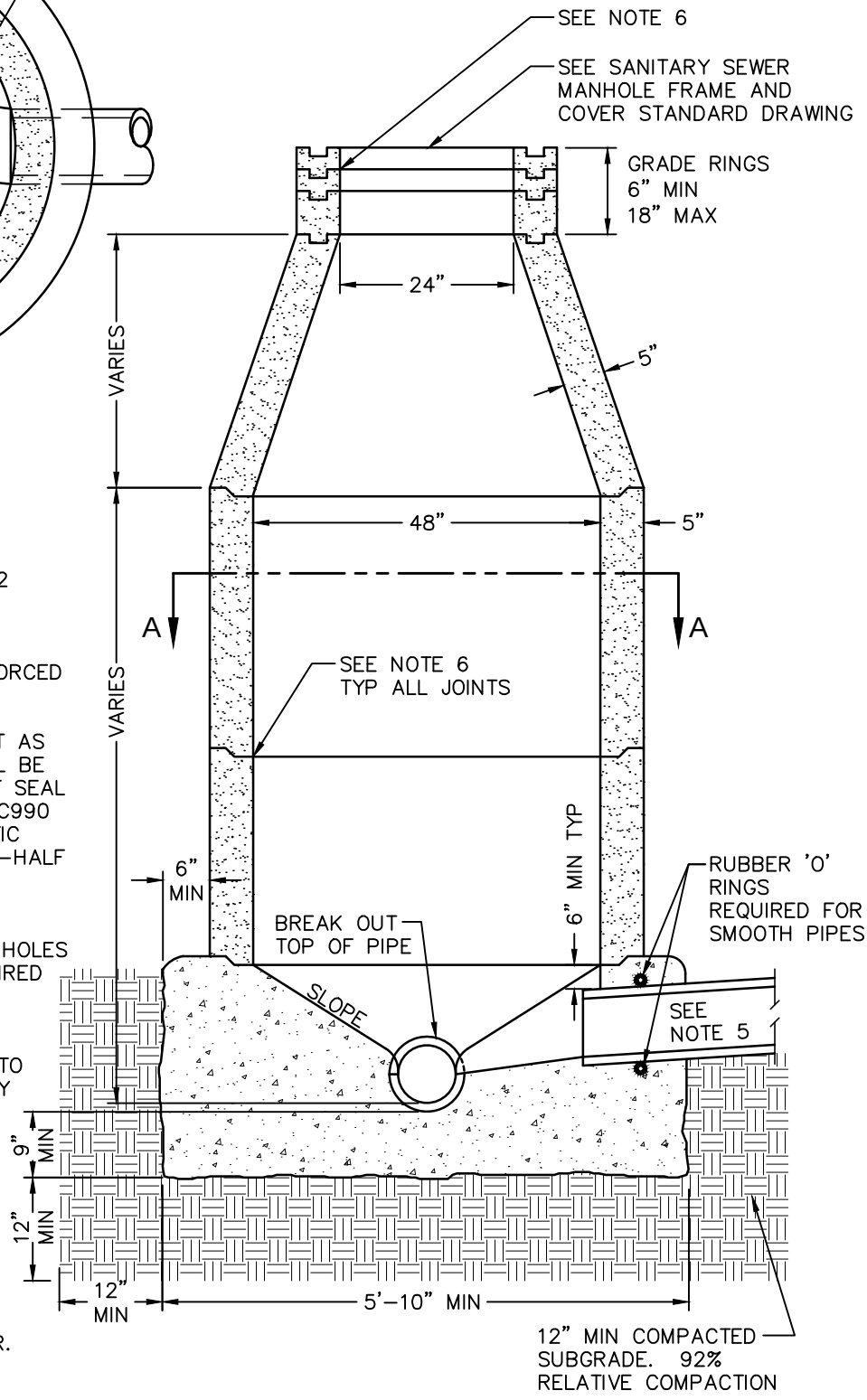
REVISIONS
09/08/16
BK 2016

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SECTION A-A

FORM TROUGH IN BOTTOM OF MANHOLE IN DIRECTION OF FLOW. TROUGH SHALL BE STEEL TROWELED SMOOTH. SEE TYPICAL FLOW CHANNELS FOR SANITARY SEWER MANHOLES STANDARD DRAWING.



NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. 48" MANHOLES ARE REQUIRED FOR SEWER PIPE SIZES FROM 8" TO 24" OR AS REQUIRED BY THE CITY ENGINEER.
6. MORTAR INSIDE OF GRADE RINGS AND ALL INTERIOR JOINTS TO A SMOOTH FINISH.
7. A MAXIMUM OF 2 SEWER LATERAL CONNECTIONS WILL BE ALLOWED AT EACH SEWER MANHOLE, UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER.

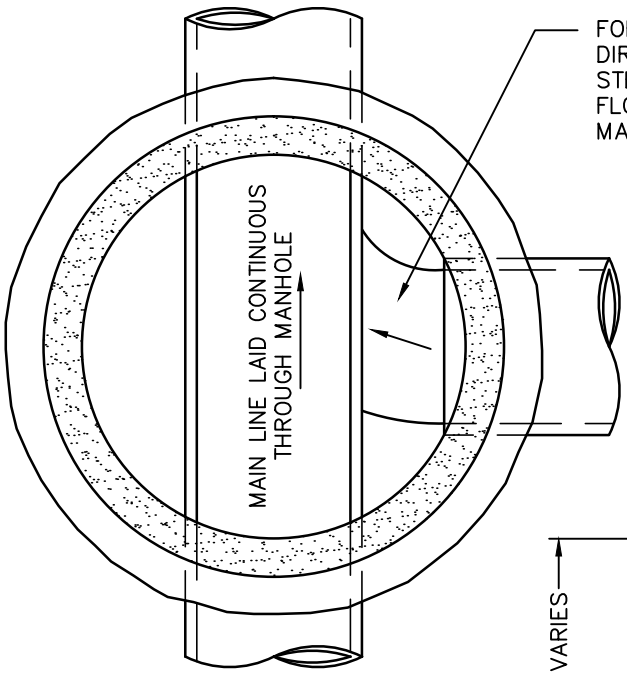
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

48" SANITARY SEWER MANHOLE

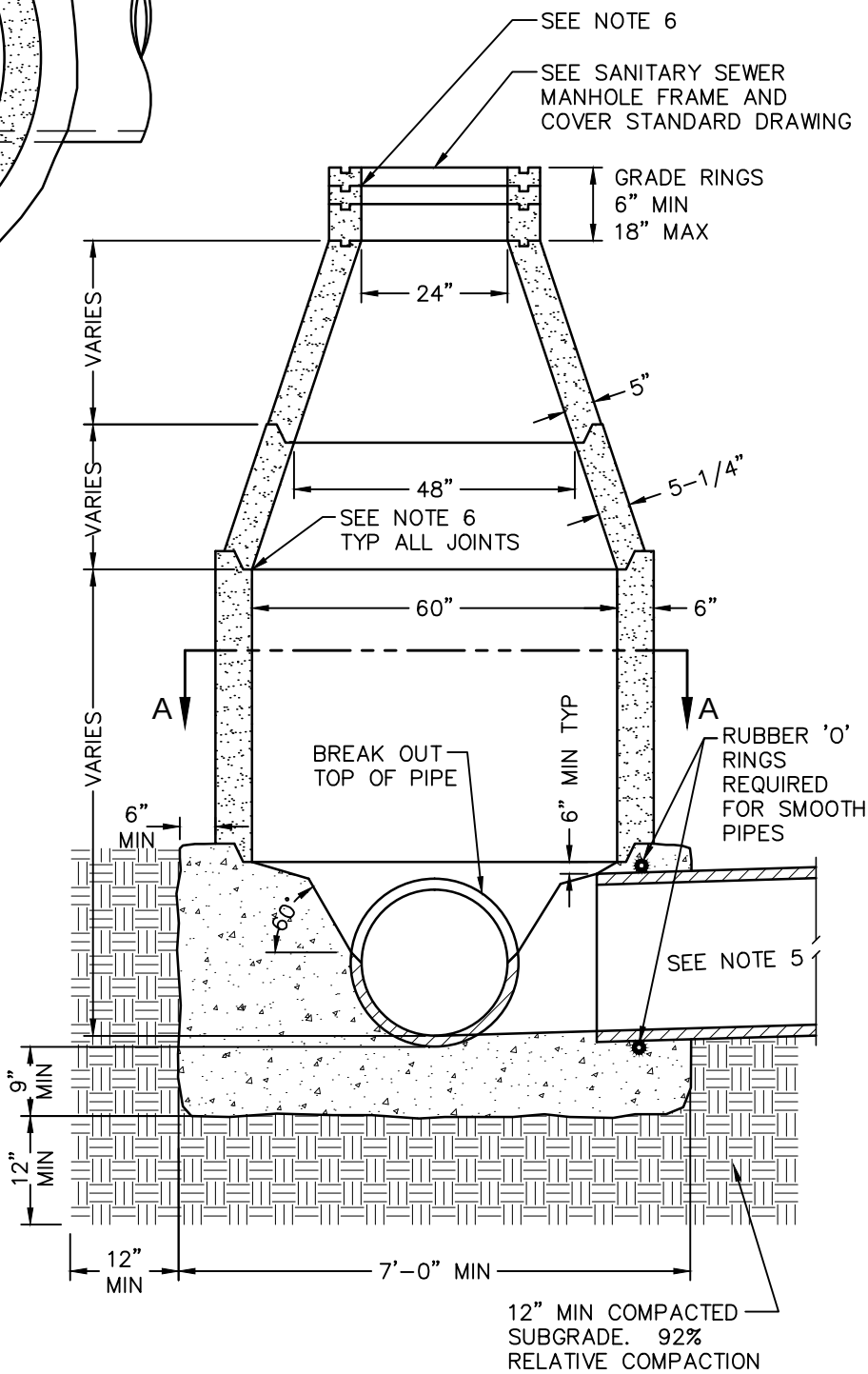
REVISIONS
09/27/13
BK 2016

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SECTION A-A

FORM TROUGH IN BOTTOM OF MANHOLE IN DIRECTION OF FLOW. TROUGH SHALL BE STEEL TROWELED SMOOTH. SEE TYPICAL FLOW CHANNELS FOR SANITARY SEWER MANHOLES STANDARD DRAWING.



NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. 60" MANHOLES ARE REQUIRED FOR SEWER PIPE SIZES FROM 27" TO 36" OR AS REQUIRED BY THE CITY ENGINEER.
6. MORTAR INSIDE OF GRADE RINGS AND ALL INTERIOR JOINTS TO A SMOOTH FINISH.
7. A MAXIMUM OF 2 SEWER LATERAL CONNECTIONS WILL BE ALLOWED AT EACH SEWER MANHOLE, UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER.

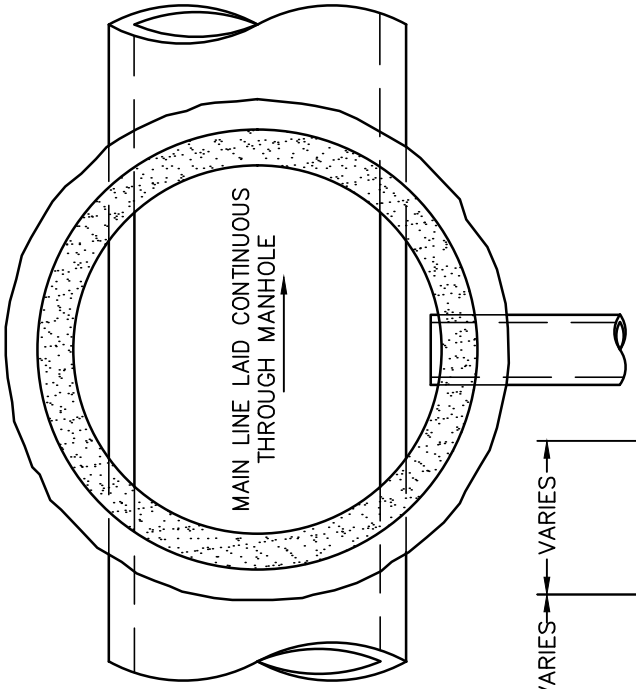
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

60" SANITARY SEWER MANHOLE

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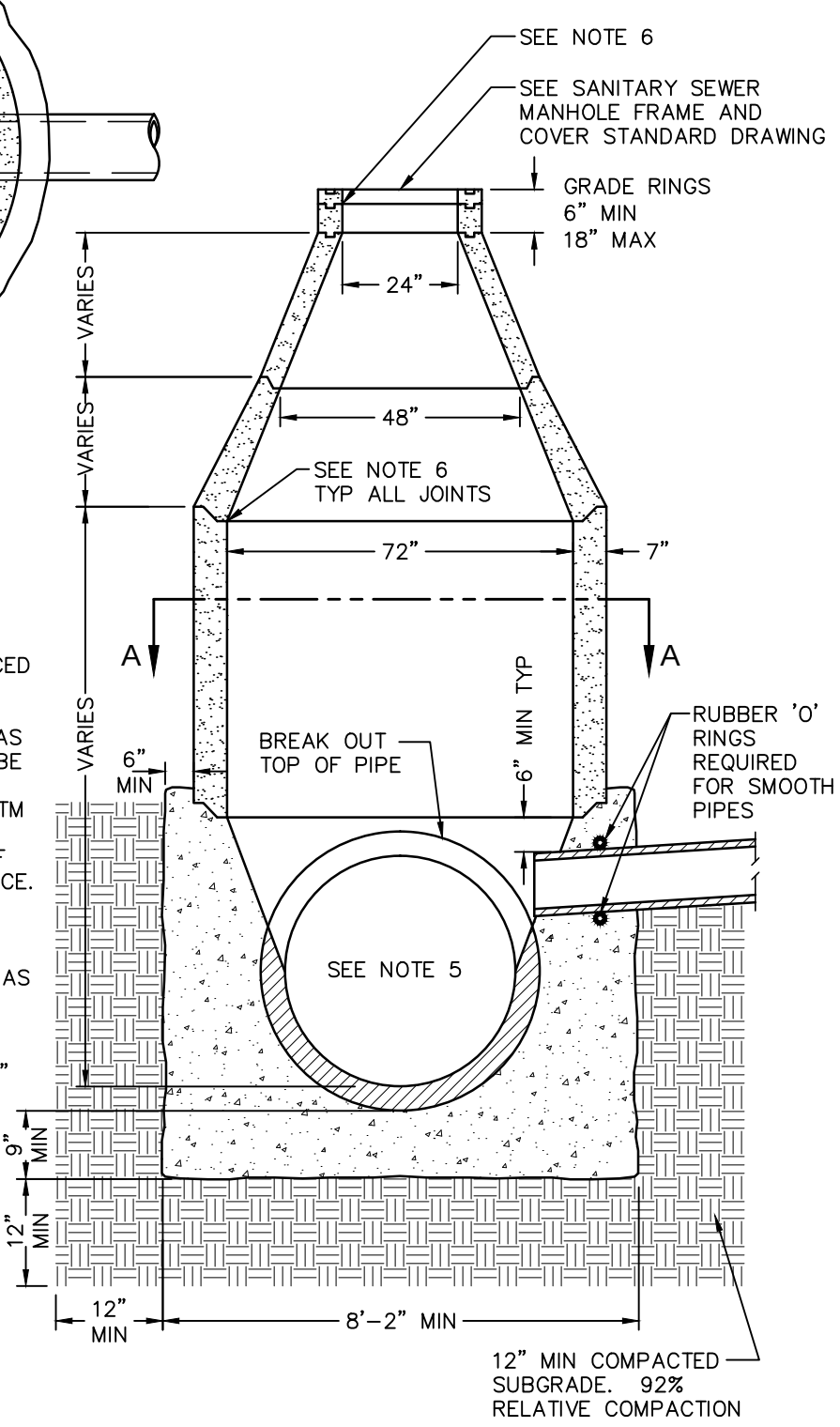
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SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. 72" MANHOLES ARE REQUIRED FOR SEWER PIPE SIZES FROM 39" TO 48" OR AS REQUIRED BY THE CITY ENGINEER.
6. MORTAR INSIDE OF GRADE RINGS AND ALL INTERIOR JOINTS TO A SMOOTH FINISH.
7. A MAXIMUM OF 2 SEWER LATERAL CONNECTIONS WILL BE ALLOWED AT EACH SEWER MANHOLE, UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER.



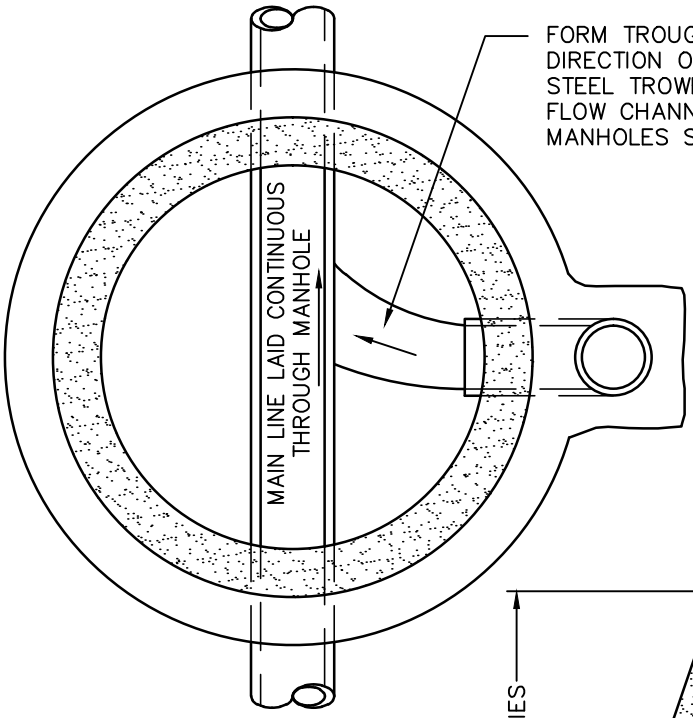
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

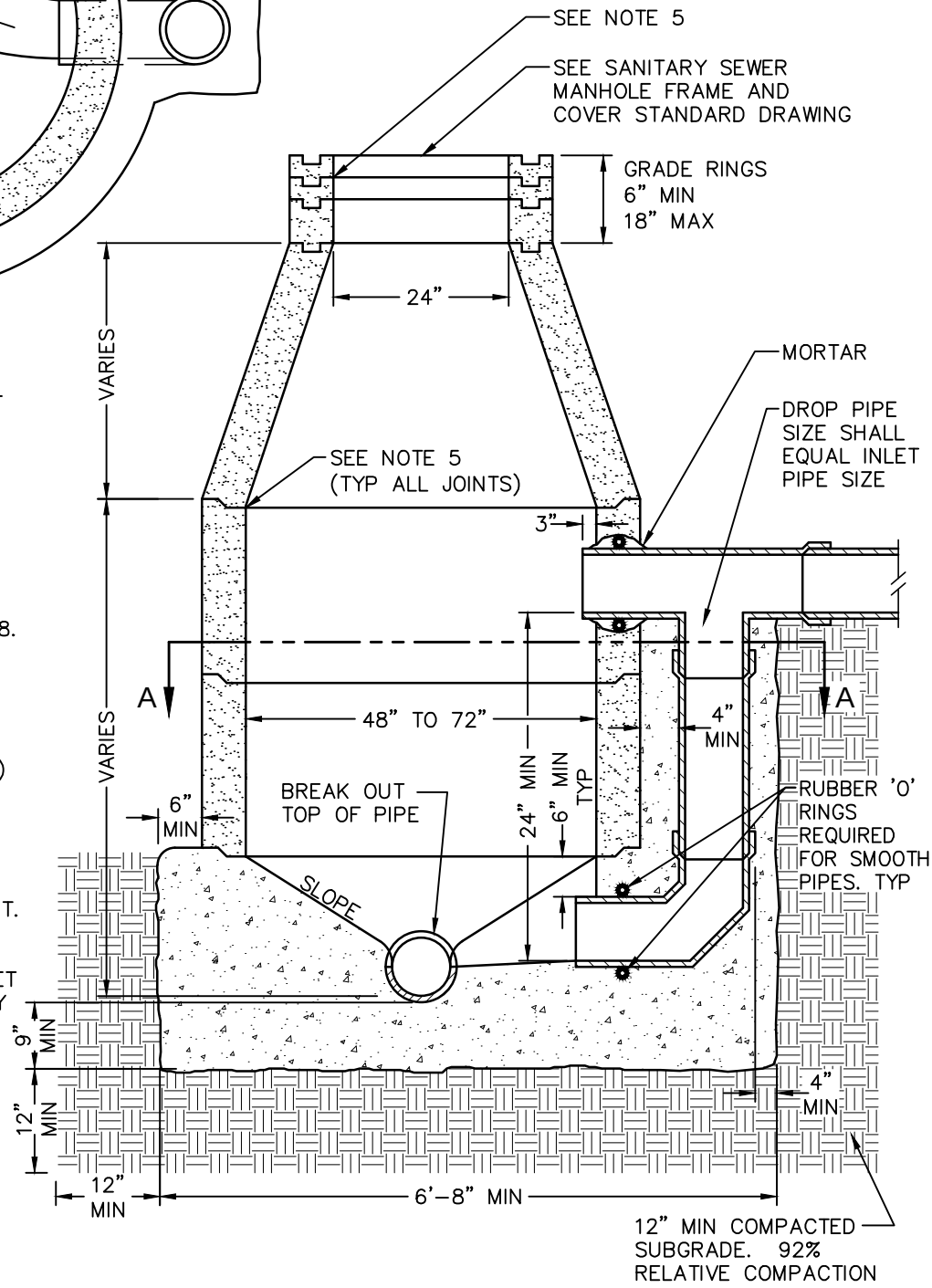
72" SANITARY SEWER MANHOLE

REVISIONS
09/27/13
BK 2016

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SECTION A-A



NOTES:

1. ALL CONCRETE SHALL BE CLASS 2 CONCRETE.
2. MANHOLE PIPE, CONE AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE AS PER ASTM C478.
3. JOINTS SHALL BE RUBBER GASKET AS PER ASTM C443 OR JOINTS SHALL BE CONSTRUCTED WITH MASTIC (KENT SEAL NO. 2 OR EQUAL) AS PER ASTM C990 AT CONTRACTOR'S OPTION. MASTIC SHALL COVER A MINIMUM OF ONE-HALF THE COMPRESSED SURFACE. ALL JOINTS SHALL BE WATER TIGHT.
4. MAXIMUM DISTANCE BETWEEN MANHOLES SHALL BE 500 FEET OR AS REQUIRED BY THE CITY ENGINEER.
5. MORTAR INSIDE OF GRADE RINGS AND ALL INTERIOR JOINTS TO A SMOOTH FINISH.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

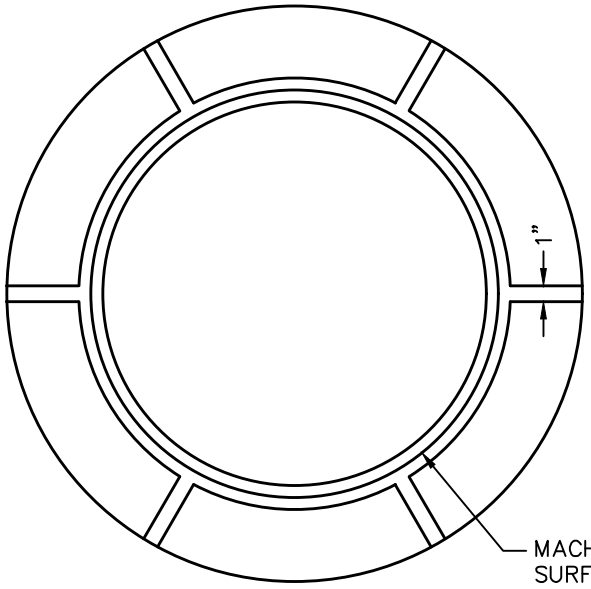
SANITARY SEWER DROP MANHOLE

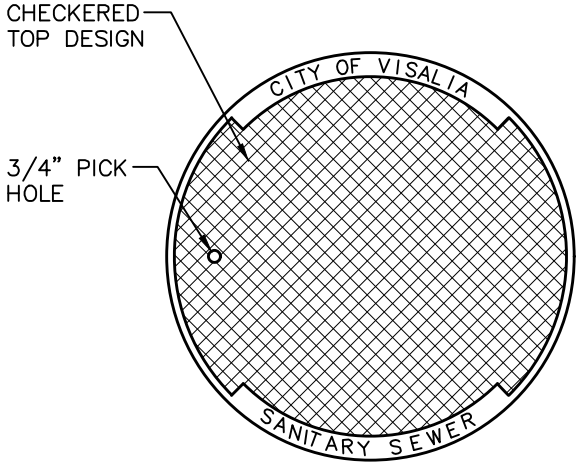
REVISIONS
09/27/13
BK 2016

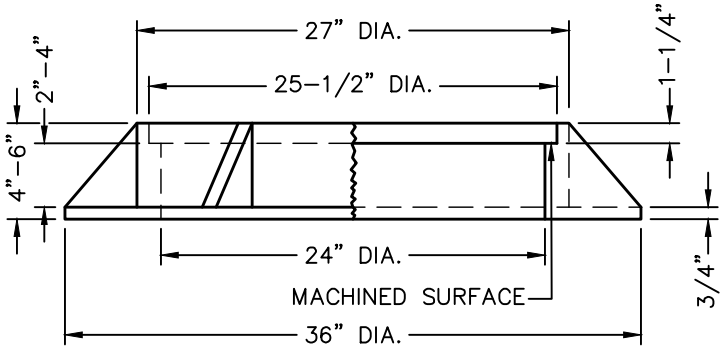
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RESERVED FOR FUTURE DETAIL

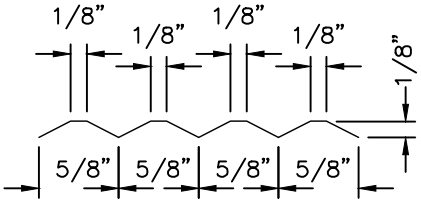
APPROVED BY:_____ _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS BK 2016
	S-5

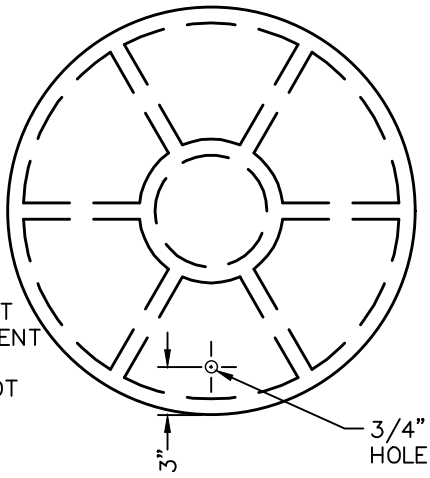


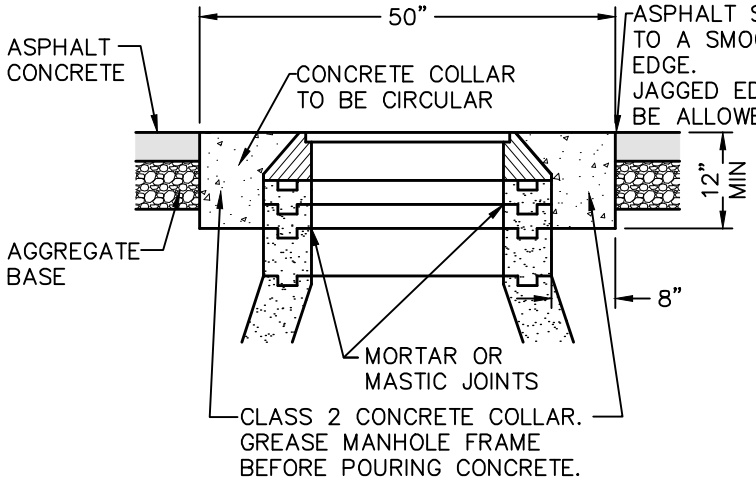




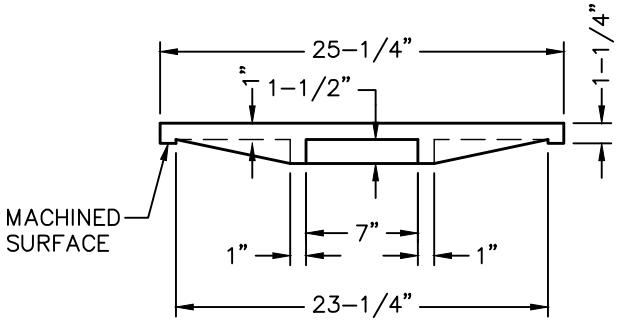
MANHOLE FRAME







MANHOLE ADJUSTMENT



MANHOLE COVER

NOTE: FRAME, COVER AND CONCRETE COLLAR SHALL MATCH CROSS SLOPE.
CURE CONCRETE A MINIMUM OF 48 HOURS PRIOR TO TRAFFIC USE.

APPROVED BY: _____ 02/05/25
CITY ENGINEER R.C.E. 71192 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

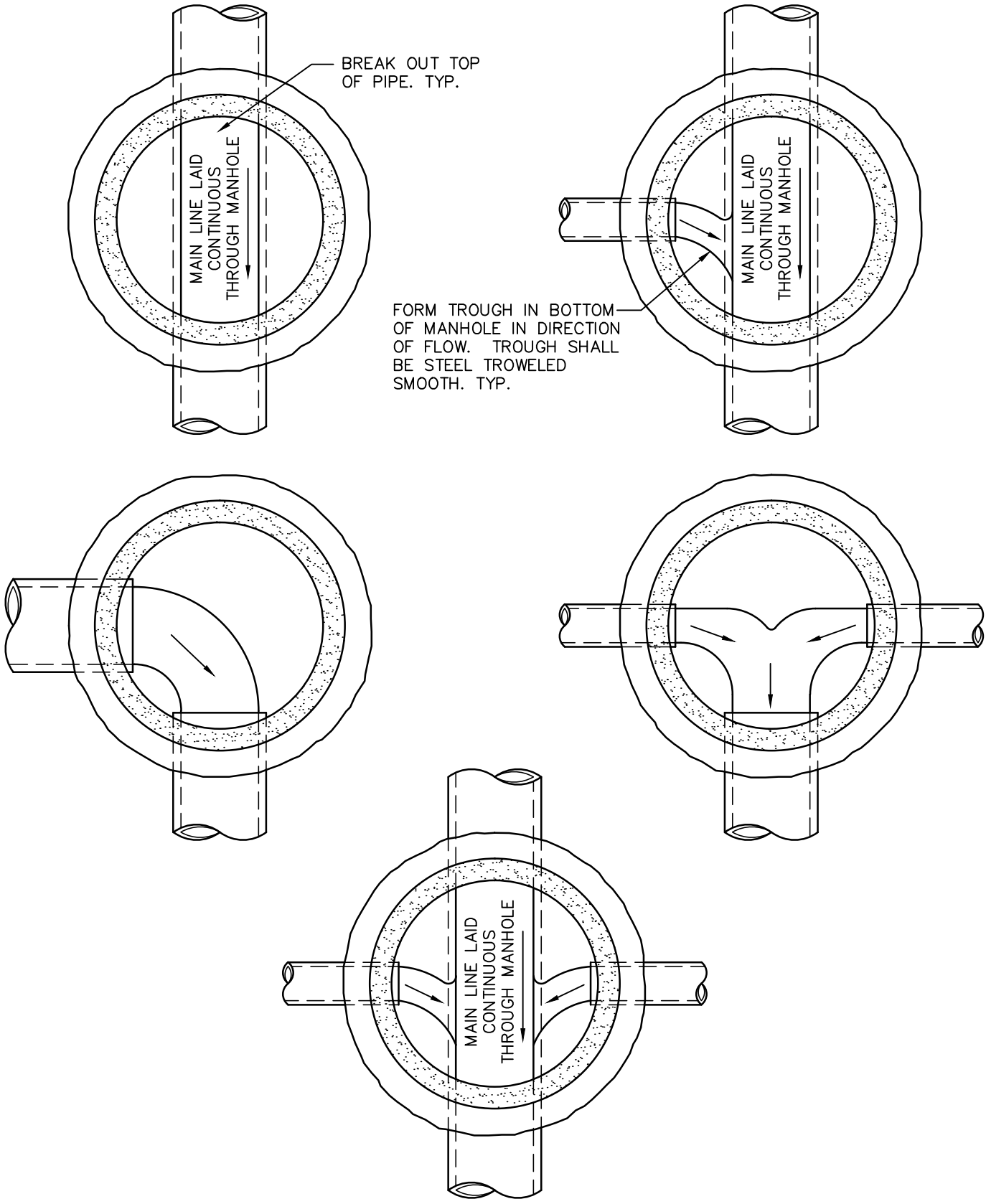
SANITARY SEWER MANHOLE FRAME AND COVER

REVISIONS
02/05/25
BK 2016

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RESERVED FOR FUTURE DETAIL

APPROVED BY: _____ _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS BK 2016
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APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

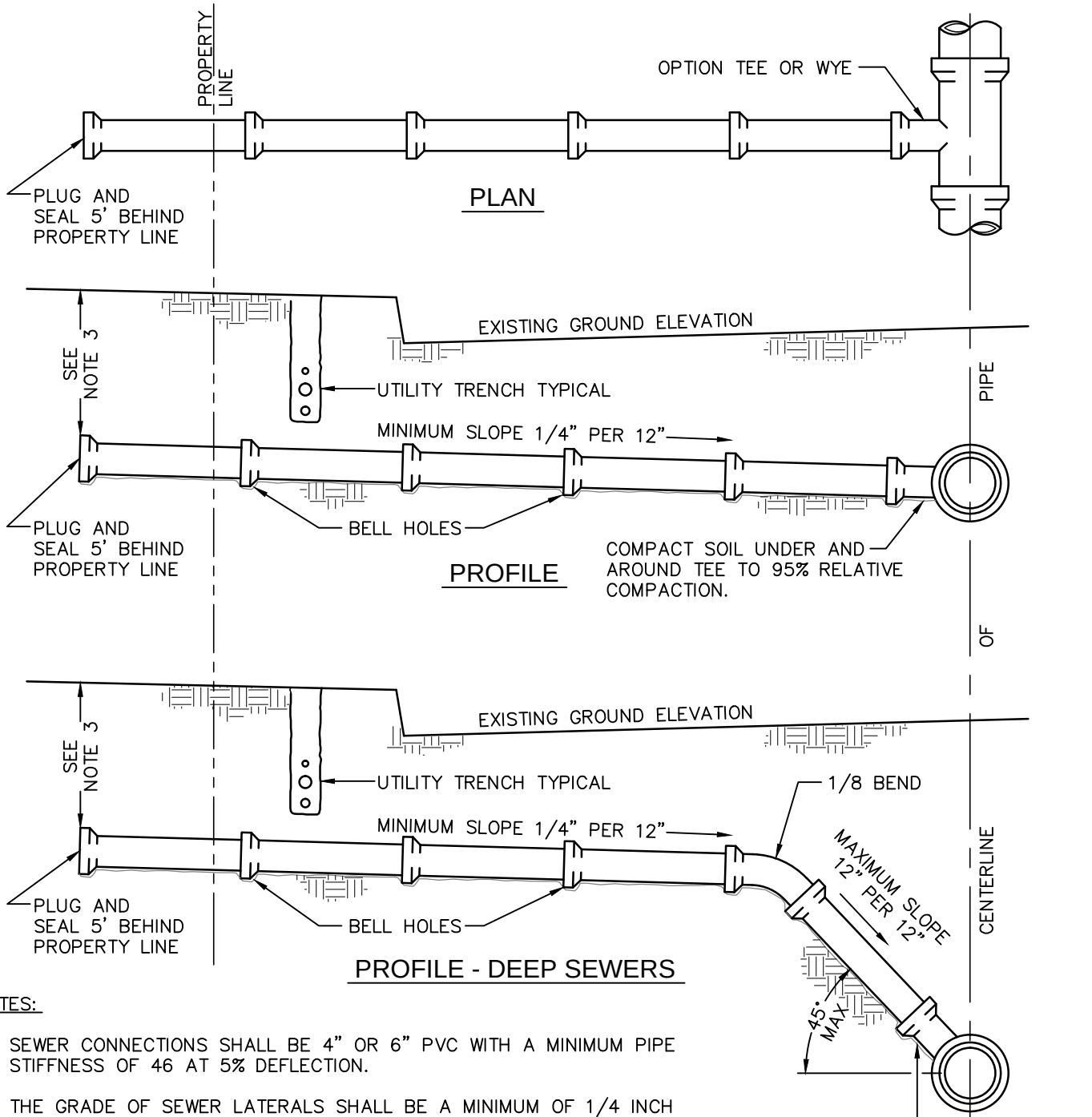
TYPICAL FLOW CHANNELS FOR SANITARY SEWER MANHOLES

REVISIONS
11/22/99
BK 2016

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RESERVED FOR FUTURE DETAIL

APPROVED BY: _____ _____	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
RESERVED	REVISIONS BK 2016
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NOTES:

1. SEWER CONNECTIONS SHALL BE 4" OR 6" PVC WITH A MINIMUM PIPE STIFFNESS OF 46 AT 5% DEFLECTION.
2. THE GRADE OF SEWER LATERALS SHALL BE A MINIMUM OF 1/4 INCH PER 12 INCHES AND A MAXIMUM OF 12 INCHES PER 12 INCHES FOR DEEP SEWERS. UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER.
3. THE END OF SEWER LATERALS SHALL BE A MINIMUM 5' DEEP OR AS APPROVED BY THE CITY ENGINEER AND SHALL BE PLUGGED PRIOR TO BACKFILL WITH A CAP APPROVED BY THE PIPE MANUFACTURER FOR USE WITH THE PRODUCT.
4. SADDLES MOUNTED ON ALL PIPES SHALL HAVE A RUBBER GASKET AND SHALL BE SECURED WITH STAINLESS STEEL BANDS AND HARDWARE. CONNECTION SHALL BE WATER TIGHT.
5. A 3" "S" SHALL BE CHISELED OR STAMPED ON THE TOP OF CONCRETE CURB TO VERIFY SEWER LATERAL LOCATION.

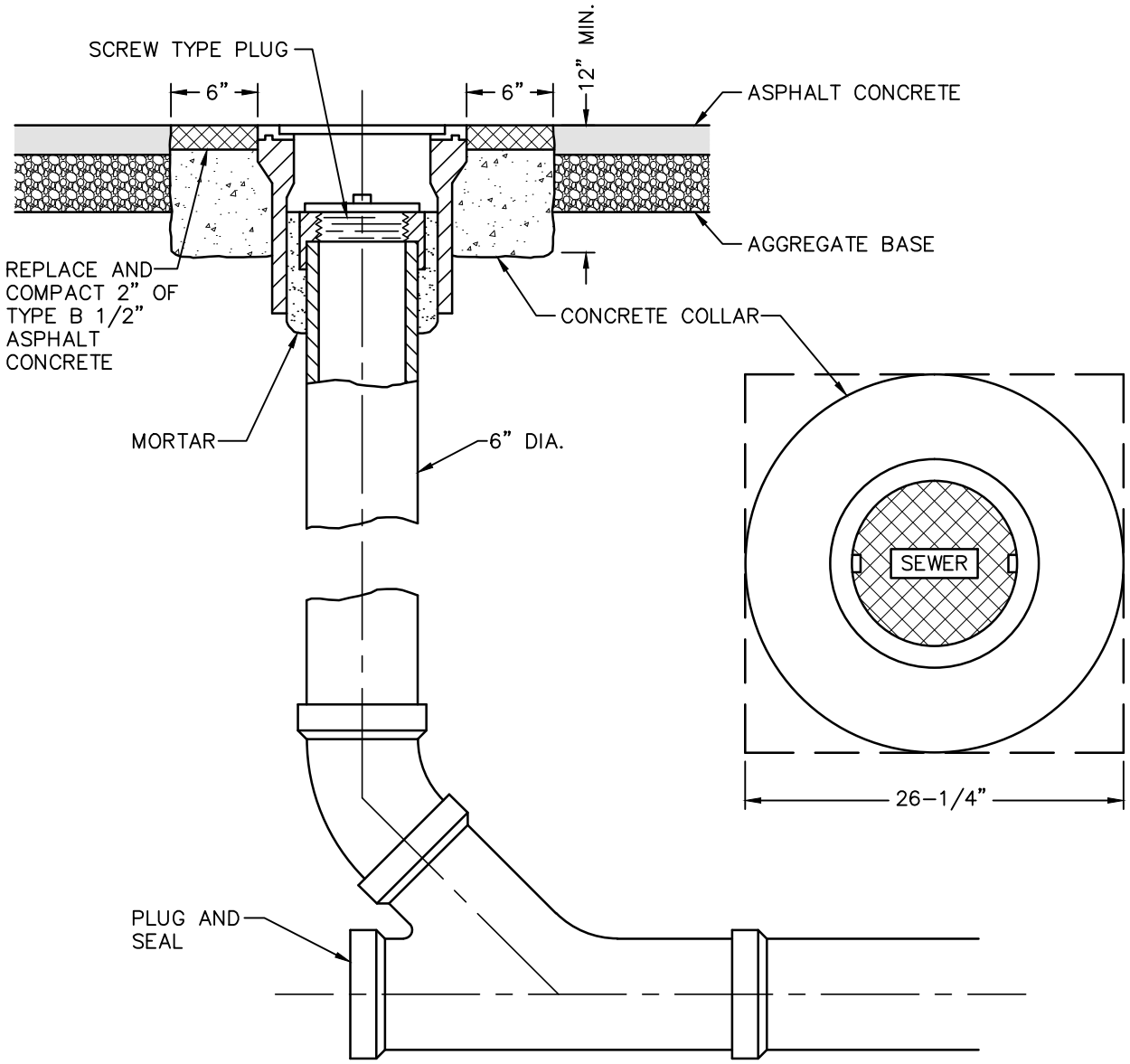
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

SEWER CONNECTION

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NOTES:

1. SEWER CLEANOUT RISER SHALL BE 6" MINIMUM PVC WITH A MINIMUM PIPE STIFFNESS OF 46 AT 5% DEFLECTION.
2. SEWER CLEANOUT FRAME AND COVER SHALL BE CHRISTY G5 TRAFFIC VALVE BOX OR EQUAL.
3. PLUG MAIN LINE END WITH CAP APPROVED BY THE PIPE MANUFACTURER FOR USE WITH THE PRODUCT.
4. CONCRETE COLLAR SHALL BE CLASS 3 CONCRETE.
5. CONCRETE COLLAR SHALL BE 26-1/4" IN DIAMETER OR ALTERNATIVE 26-1/4"X26-1/4" SQUARE.
6. MORTAR MIXTURE SHALL BE ONE PART CEMENT PER TWO PARTS SAND.

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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

SANITARY SEWER CLEANOUT

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RESERVED FOR FUTURE DETAIL

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RESERVED	REVISIONS BK 2016
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OUTSIDE COMMERCIAL AND INDUSTRIAL SAND, SILT, GREASE, OIL, AND GARBAGE INTERCEPTORS

1. THE SIZE AND DETAILS OF ALL INTERCEPTORS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CALIFORNIA PLUMBING CODE, CURRENT EDITION, HEREINAFTER REFERRED TO AS CPC. ALL INTERCEPTORS SHALL BE SEALED AND WATER TIGHT.

2. INTERCEPTORS SHALL BE CONSTRUCTED AND VENTED IN ACCORDANCE WITH THE SPECIFICATIONS SET FORTH IN THE CPC.

3. THE LOCATION OF THE INTERCEPTOR SHALL BE APPROVED BY THE COMMUNITY DEVELOPMENT DEPARTMENT PRIOR TO CONSTRUCTION.

4. ALL CAST IN PLACE OR PRECAST INTERCEPTOR UNITS SHALL BE APPROVED BY THE COMMUNITY DEVELOPMENT DEPARTMENT PRIOR TO CONSTRUCTION.

5. THE OWNER SHALL BE RESPONSIBLE FOR PROVIDING ALL DOCUMENTATION AND TESTING TO CERTIFY THAT THE INTERCEPTORS AND WASTE STREAMS MEETS THE REQUIREMENTS OF ALL CURRENT REGULATIONS AND THE QUALITY ASSURANCE DIVISION REQUIREMENTS.

6. PRE –CAST INTERCEPTORS SHALL BE LABELED WITH THE MANUFACTURERS NAME, MODEL NUMBER AND SHALL HAVE AN I.A.P.M.O. CERTIFICATION MARK.

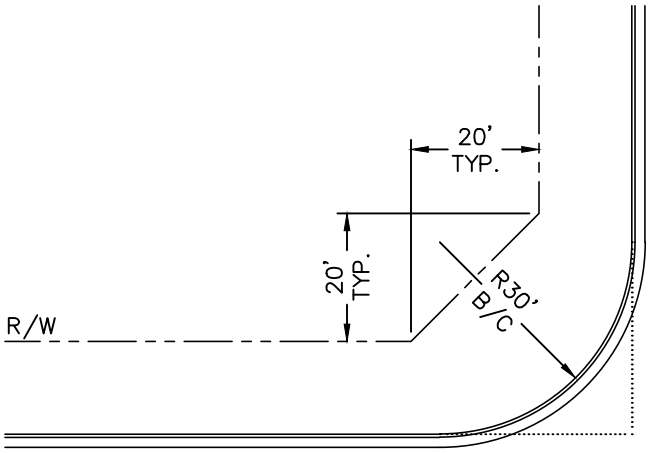
7. ALL CONCRETE FOR CAST–IN–PLACE INTERCEPTORS SHALL BE CLASS 2 CONCRETE IN ACCORDANCE WITH THE CITY OF VISALIA STANDARD SPECIFICATIONS AND ENGINEERING DESIGN & IMPROVEMENT STANDARDS.

8. CAST IRON FRAMES MAY BE CAST INTO THE INTERCEPTOR LID.

9. ALL INTERCEPTORS SHALL BE ACCESSIBLE TO THE QUALITY ASSURANCE DIVISION FOR TESTING AT ANY TIME.

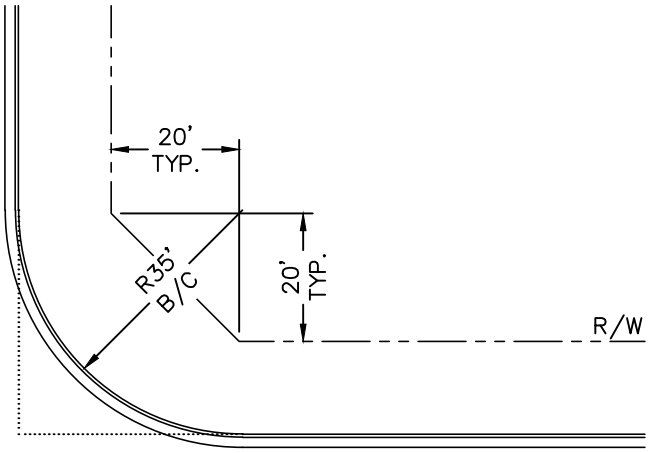
CITY OF VISALIA QUALITY ASSURANCE DIVISION
7579 AVENUE 288
VISALIA, CA. 93277–9435
TEL. 559–713–4529

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OUTSIDE COMMERCIAL AND INDUSTRIAL SAND, SILT, GREASE, OIL AND GARBAGE INTERCEPTORS	REVISIONS 09/27/13 BK 2016 — S–13

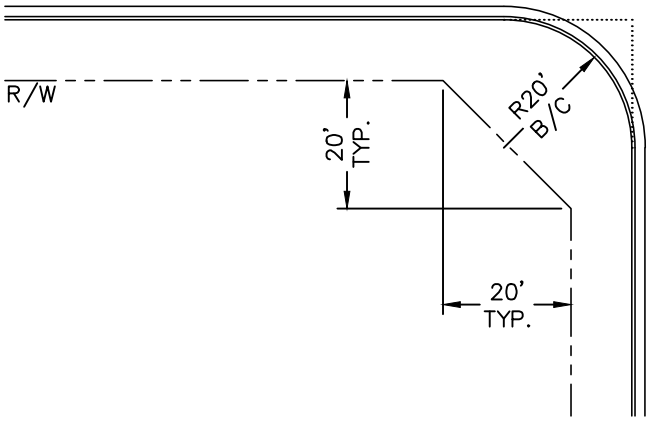


COLLECTOR

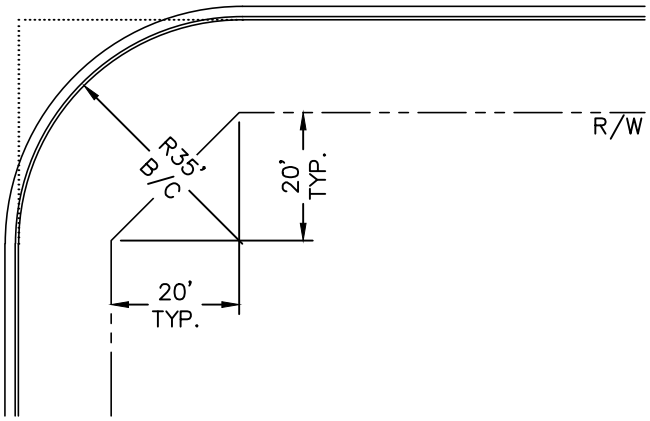
(RESIDENTIAL, HIGH VOLUME, AND COMMERCIAL/INDUSTRIAL)



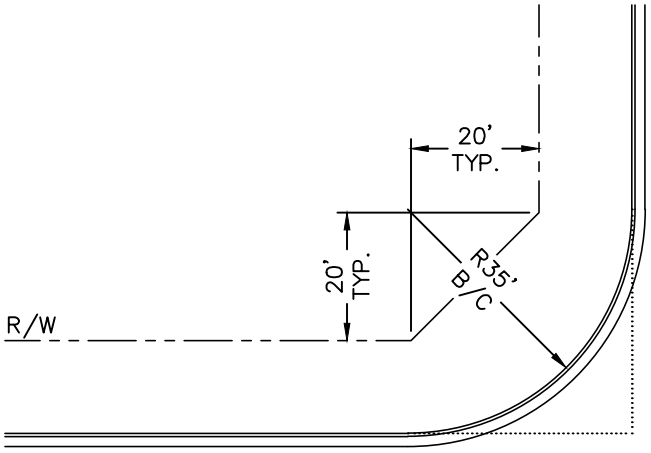
MAJOR ARTERIAL



LOCAL



MINOR ARTERIAL



PARKWAY

NOTES:

1. ALL CURB RETURNS SHALL HAVE SIDEWALK RAMPS PER CITY OF VISALIA CONCRETE STANDARD DRAWINGS.
2. THE CITY ENGINEER MAY REQUEST DIFFERENT DIMENSIONS TO ACCOMMODATE THE CITY'S SPECIAL NEEDS.

ABBREVIATIONS:

B/C = BACK OF CURB

R/W = RIGHT OF WAY

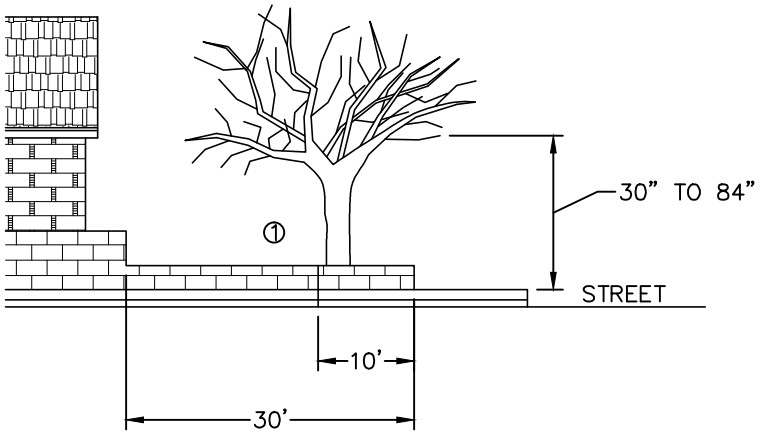
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

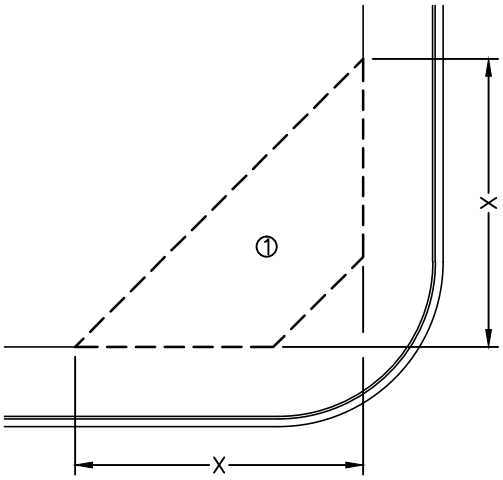
CORNER RADII DEDICATIONS

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ELEVATION



PLAN

CONSTRUCTION NOTES:

① VERTICAL CLEAR ZONE

ROADWAY TYPE	X
6 LANE ARTERIAL	40'
4 LANE ARTERIAL	40'
4 LANE COLLECTOR	40'
2 LANE COLLECTOR	30'
LOCAL	30'

NOTES:

1. SIGNS, FENCES, WALLS, UTILITY BOXES, STRUCTURES, SHRUBS, HEDGES OR OTHER PLANTS, BUT EXCLUDING TREES OVER 30 INCHES IN HEIGHT SHALL NOT BE PERMITTED WITHIN THE RESTRICTED AREAS EXCEPT AS APPROVED BY CITY ENGINEER.

2. PLANTING WITHIN THE R/W IN THE VERTICAL CLEAR ZONE SHALL BE PER THE APPROVED TYPES AND DIMENSIONS AND SHALL NOT ENCROACH WITHIN THE SIGHT TRIANGLE PER AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) GUIDELINES.

3. TREES ARE PERMITTED WITHIN THE RESTRICTED AREAS PROVIDED:

   A. NO LIMBS, LEAVES, NEEDLES OR OTHER FOLIAGE ABOVE 30 INCHES OR BELOW 84 INCHES ARE PERMITTED.

   B. TREES ARE PLANTED SO AS NOT TO OBSTRUCT MORE THAN 20% OF THE VISIBILITY WHEN COMBINED WITH OTHER OBSTRUCTIONS PRESENT.

4. COLLECTOR AND ARTERIAL ROADS SHALL ADHERE TO SIGHT VISIBILITY REQUIREMENTS PER SIGHT DISTANCE REQUIREMENTS STANDARD DRAWING AND SHALL COMPLY WITH AASHTO.

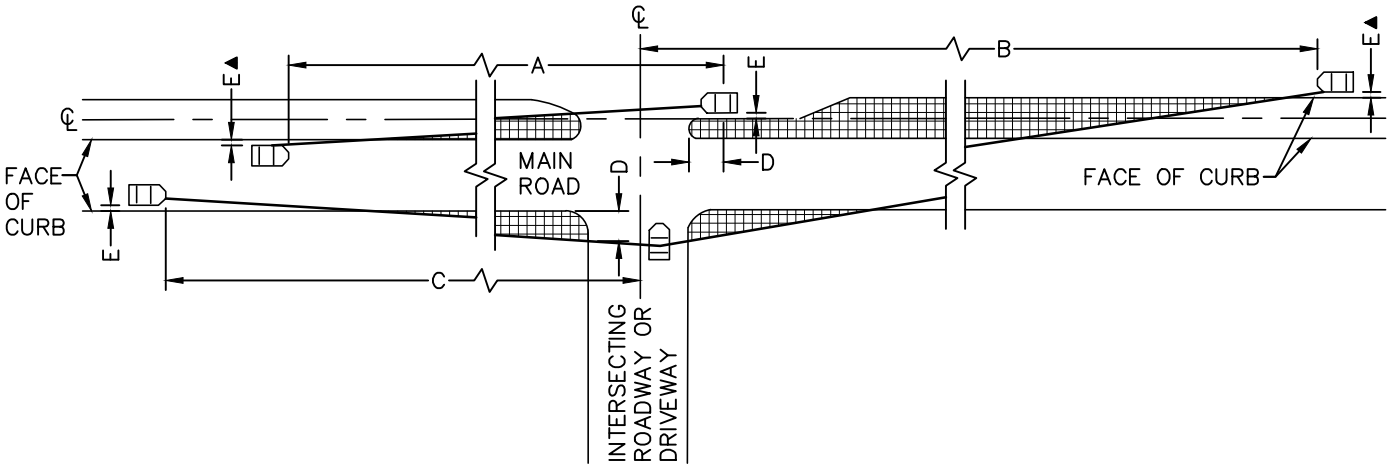
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

SIGHT VISIBILITY TRIANGLE

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LEGEND:

▲ WHERE NO MEDIAN IS PRESENT USE CENTER OF ROADWAY AS A SUBSTITUTE FOR E

HEIGHT RESTRICTED AREA (SEE NOTE 4)

TABLE A

STREET	A	B*	C**	D	E
COLLECTOR	355'	500'	385'	18'	3'
ARTERIAL	480'	700'	480'	18'	3'

* REDUCE COLUMN "B" BY 165 FEET FOR SIGNALIZED INTERSECTIONS

** DIMENSION "C" IS FOR RIGHT–TURNS AT SIDE STREET APPROACHES PROVIDING ONLY RIGHT–IN/RIGHT–OUT MOVEMENTS. WHERE LEFT TURNS ARE ALLOWED, DIMENSION "C" SHALL EQUAL DIMENSION "B".

NOTES:

1. DIMENSIONS SHOWN IN TABLE "A" SHALL BE VERIFIED BASED ON AASHTO STANDARDS.
2. SIGHT DISTANCE FOR A COLLECTOR ROADWAY IS BASED ON A PASSENGER CAR ON A ROADWAY THAT PROVIDES 2–LANES IN EACH DIRECTION WITH A 14' RAISED MEDIAN, A DESIGN SPEED OF 40 MPH, AND AN APPROACH GRADE OF LESS THAN THREE PERCENT.
3. SIGHT DISTANCE FOR AN ARTERIAL ROADWAY IS BASED ON A PASSENGER CAR ON A ROADWAY THAT PROVIDES 3–LANES IN EACH DIRECTION WITH A 24' RAISED MEDIAN, A DESIGN SPEED OF 50 MPH, AND AN APPROACH GRADE OF LESS THAN THREE PERCENT.
4. NO SIGNS, FENCES, WALLS, UTILITY BOXES, STRUCTURES, SHRUBS, HEDGES, OR OTHER PLANTS, (EXCLUDING TREES), OVER 30 INCHES IN HEIGHT SHALL BE PERMITTED WITHIN THE RESTRICTED AREAS.
5. TREES ARE PERMITTED WITHIN THE RESTRICTED AREAS PROVIDED:
   A. NO LIMBS, LEAVES NEEDLES OR OTHER FOLIAGE ABOVE 30 INCHES OR BELOW 84 INCHES ARE PERMITTED.
   B. TREES ARE PLANTED SO AS NOT TO OBSTRUCT 20% OF THE VISIBILITY WHEN COMBINED WITH OTHER OBSTRUCTIONS PRESENT.
6. SIGHT DISTANCE FOR TYPICAL RIGHT ANGLE INTERSECTION ONLY. SKEWED INTERSECTIONS WILL REQUIRE ADDITIONAL DESIGN FOR REVIEW AND APPROVAL FROM CITY ENGINEER.

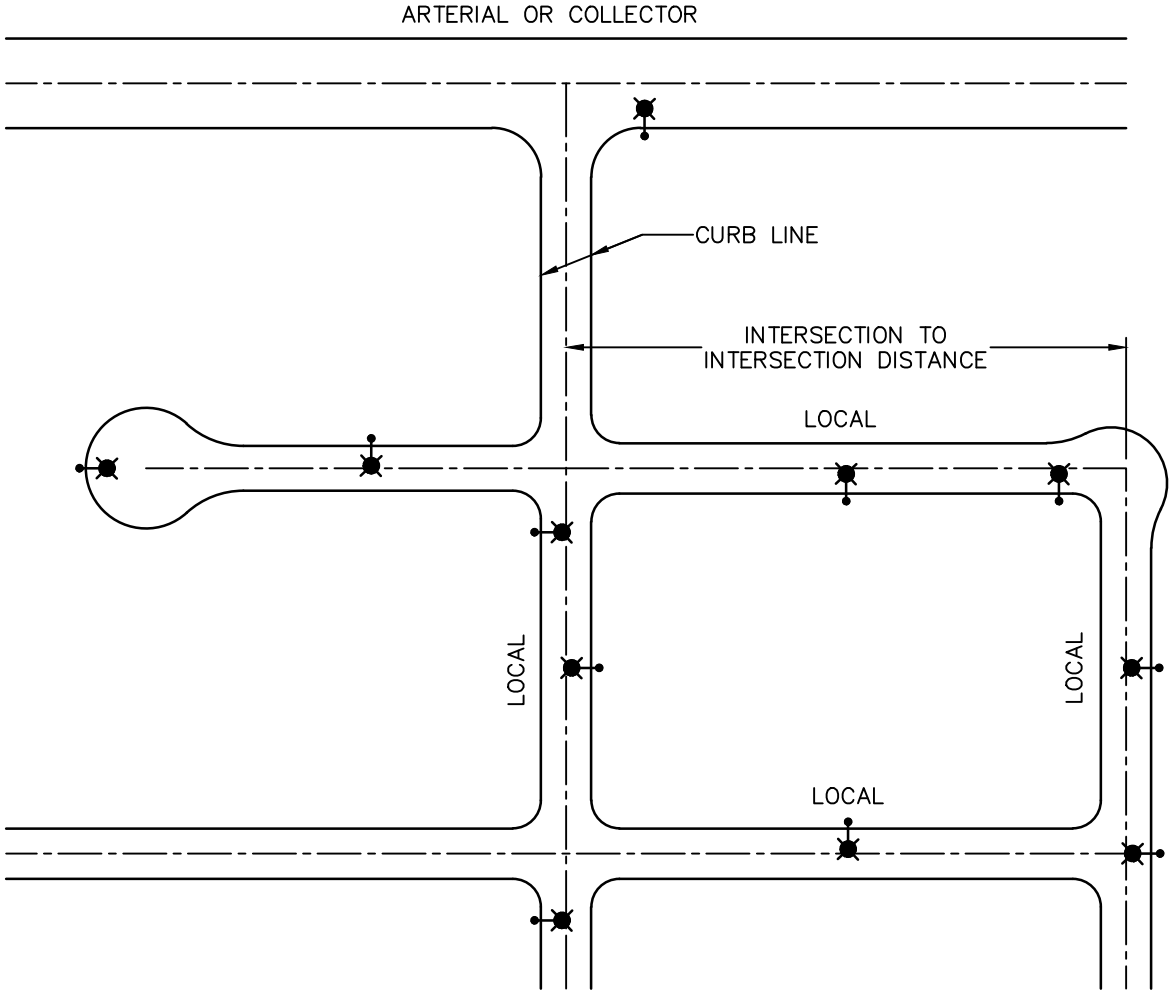
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

SIGHT DISTANCE REQUIREMENTS FOR ARTERIAL & COLLECTOR STREETS

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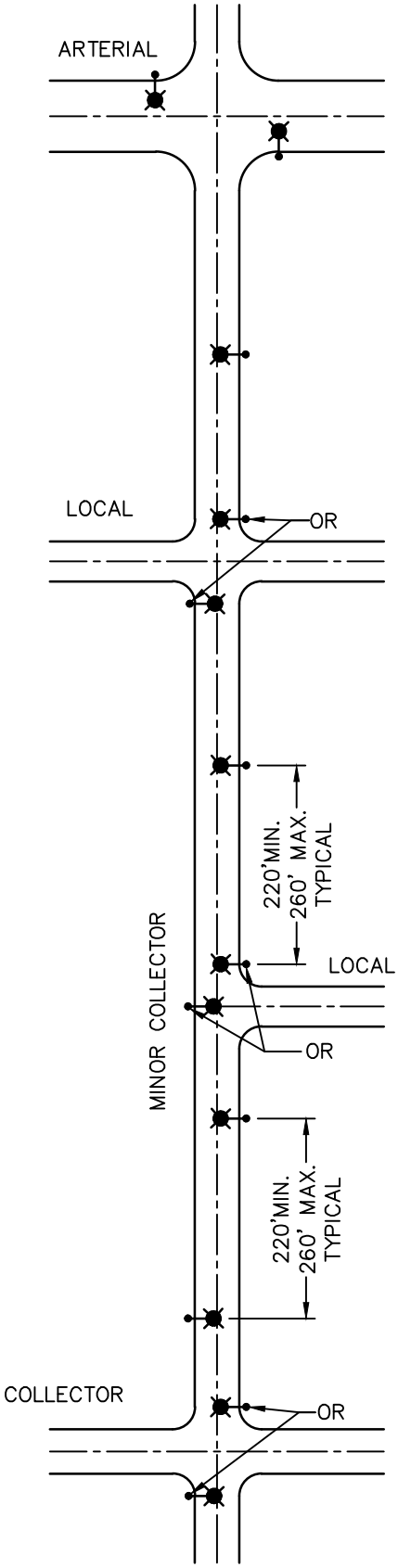
SD–3



NOTES:

1. STREETLIGHTS ON LOCAL STREETS SHALL BE LED – MINIMUM 5,800 LUMEN WITH CUT–OFF LUMINAIRES, LUMINAIRE ELEVATION OF 26', MOUNTED ON MARBLELITE POLES WITH 8' ALUMINUM MAST ARMS. ALTERNATIVE STREETLIGHT POLES ARE SUBJECT TO APPROVAL OF THE CITY ENGINEER.
2. STREETLIGHTS SHALL BE INSTALLED AT LOCATIONS AS DETERMINED BY THE CITY ENGINEER UPON REVIEW OF SUBMITTED IMPROVEMENT PLANS.
3. A STREETLIGHT SHALL BE INSTALLED AT EACH INTERSECTION. SHOULD THE DISTANCE EXCEED 360' BETWEEN INTERSECTIONS AN INTERMEDIATE STREETLIGHT, OR STREETLIGHTS, SHALL BE INSTALLED. SPACING OF STREET LIGHTS BETWEEN INTERSECTIONS WHERE REQUIRED SHALL BE 180' MINIMUM TO 240' MAXIMUM.
4. CUL–DE–SACS SHALL HAVE A MINIMUM OF ONE STREETLIGHT AND SHALL FOLLOW THE ABOVE SPACING REQUIREMENTS.
5. A STREET LIGHTING PLAN PREPARED BY A LICENSED ENGINEER SHALL BE SUBMITTED TO THE CITY. THE PLAN SHALL INCLUDE LOCATIONS OF STREETLIGHTS, PULL BOXES, CONDUIT, METER PEDESTAL, POINT OF SERVICE, AND VOLTAGE DROP CALCULATIONS. THE LIGHTING SYSTEM MUST COMPLY WITH THE CURRENT NATIONAL ELECTRICAL CODE (NEC) AND THE CALIFORNIA ELECTRICAL CODE (CEC).
6. STREET LIGHTING SHALL BE DESIGNED TO MINIMIZE THE NUMBER OF METER PEDESTALS.
7. A "WILL SERVE" LETTER FROM SOUTHERN CALIFORNIA EDISON SHALL BE SUBMITTED TO THE CITY PRIOR TO APPROVAL OF STREET LIGHTING PLANS.
8. A MINIMUM SEPARATION OF 20' IS REQUIRED BETWEEN TREES AND STREETLIGHT POLES.
9. ALL STREETLIGHTS INSTALLED OR REPLACED IN THE CENTRAL BUSINESS DISTRICT ARE SUBJECT TO APPROVAL OF THE CITY ENGINEER.

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LOCAL STREET LIGHTING RESIDENTIAL & INDUSTRIAL	REVISIONS 04/29/16 BK 2016 — SL–1



NOTES:

1. STREETLIGHTS ON MINOR COLLECTOR STREETS SHALL BE LED – MINIMUM 9,500 LUMEN WITH CUT–OFF LUMINAIRES, LUMINAIRE ELEVATION OF 29' MOUNTED ON MARBLELITE POLES WITH 8' ALUMINUM MAST ARMS.
2. STREETLIGHTS SHALL BE INSTALLED AT LOCATIONS AS DETERMINED BY THE CITY ENGINEER UPON REVIEW OF SUBMITTED IMPROVEMENT PLANS.
3. A STREETLIGHT SHALL BE INSTALLED AT EACH INTERSECTION. STREETLIGHT SPACING SHALL BE 220' MINIMUM TO 260' MAXIMUM.
4. STREETLIGHTS SHALL BE STAGGERED FROM SIDE TO SIDE OF STREET, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
5. IF AN INTERSECTION IS SIGNALIZED, A STREETLIGHT SHALL BE INSTALLED ON EACH CORNER AS A PART OF THE TRAFFIC SIGNAL SYSTEM.
6. A STREET LIGHTING PLAN PREPARED BY A LICENSED ENGINEER SHALL BE SUBMITTED TO THE CITY. THE PLAN SHALL INCLUDE LOCATIONS OF STREETLIGHTS, PULL BOXES, CONDUIT, METER PEDESTAL, POINT OF SERVICE, AND VOLTAGE DROP CALCULATIONS. THE LIGHTING SYSTEM MUST COMPLY WITH THE CURRENT NATIONAL ELECTRICAL CODE (NEC) AND THE CALIFORNIA ELECTRICAL CODE (CEC).
7. STREET LIGHTING SHALL BE DESIGNED TO MINIMIZE THE NUMBER OF METER PEDESTALS.
8. A "WILL SERVE" LETTER FROM SOUTHERN CALIFORNIA EDISON SHALL BE SUBMITTED TO THE CITY PRIOR TO APPROVAL OF STREET LIGHTING PLANS.
9. A MINIMUM SEPARATION OF 20' IS REQUIRED BETWEEN TREES AND STREETLIGHT POLES.
10. ALL STREETLIGHTS INSTALLED OR REPLACED IN THE CENTRAL BUSINESS DISTRICT ARE SUBJECT TO APPROVAL OF THE CITY ENGINEER.

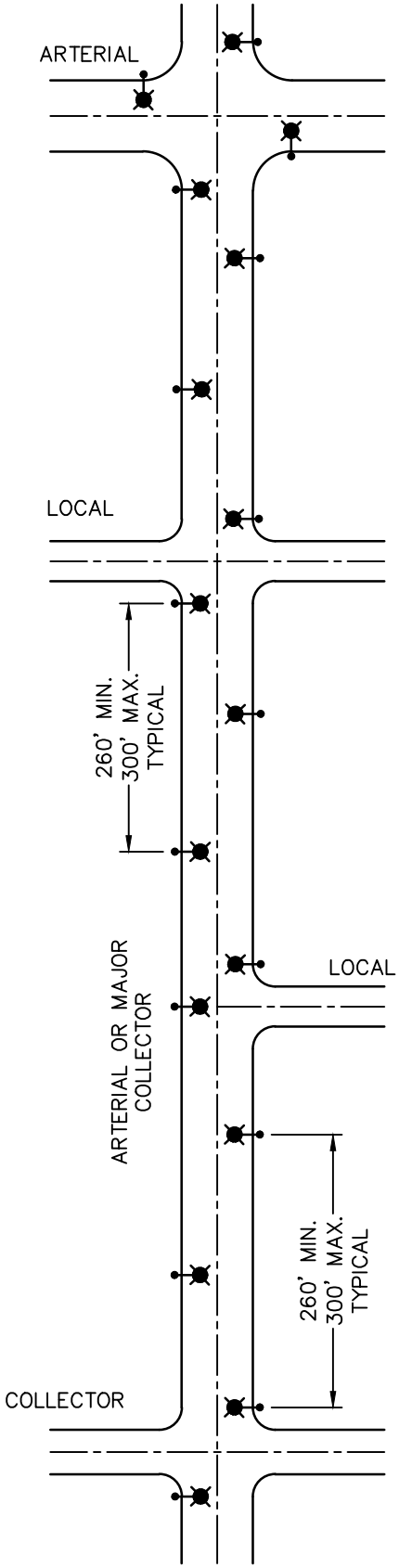
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

MINOR COLLECTOR STREET LIGHTING

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NOTES:

1. STREETLIGHTS ON ARTERIAL STREETS SHALL BE LED – MINIMUM 16,000 LUMEN WITH CUT–OFF LUMINAIRES, LUMINAIRE ELEVATION OF 29', MOUNTED ON MARBLELITE POLES WITH 8' ALUMINUM MAST ARMS.
2. STREETLIGHTS ON MAJOR COLLECTOR STREETS SHALL BE LED – MINIMUM 9,500 LUMEN WITH CUT–OFF LUMINAIRES, LUMINAIRE ELEVATION OF 29', MOUNTED ON MARBLELITE POLES WITH 8' ALUMINUM MAST ARMS.
3. STREETLIGHTS SHALL BE INSTALLED AT LOCATIONS AS DETERMINED BY THE CITY ENGINEER UPON REVIEW OF SUBMITTED IMPROVEMENT PLANS.
4. TWO STREETLIGHTS SHALL BE INSTALLED AT EACH INTERSECTION. STREETLIGHT SPACING SHALL BE 260' MINIMUM TO 300' MAXIMUM.
5. STREETLIGHTS SHALL BE INSTALLED ON BOTH SIDES OF THE STREET.
6. IF AN INTERSECTION IS SIGNALIZED, A STREETLIGHT SHALL BE INSTALLED ON EACH CORNER AS A PART OF THE TRAFFIC SIGNAL SYSTEM.
7. A STREETLIGHT PLAN PREPARED BY A LICENSED ENGINEER SHALL BE SUBMITTED TO THE CITY. THE PLAN SHALL INCLUDE LOCATIONS OF STREETLIGHTS, PULL BOXES, CONDUIT, METER PEDESTAL, POINT OF SERVICE, AND VOLTAGE DROP CALCULATIONS. THE LIGHTING SYSTEM MUST COMPLY WITH THE CURRENT NATIONAL ELECTRICAL CODE (NEC) AND THE CALIFORNIA ELECTRICAL CODE (CEC).
8. STREET LIGHTING SHALL BE DESIGNED TO MINIMIZE THE NUMBER OF METER PEDESTALS.
9. A "WILL SERVE" LETTER FROM SOUTHERN CALIFORNIA EDISON SHALL BE SUBMITTED TO THE CITY PRIOR TO APPROVAL OF STREET LIGHTING PLANS.
10. A MINIMUM SEPARATION OF 20' IS REQUIRED BETWEEN TREES AND STREETLIGHT POLES.
11. ALL STREETLIGHTS INSTALLED OR REPLACED IN THE CENTRAL BUSINESS DISTRICT ARE SUBJECT TO APPROVAL OF THE CITY ENGINEER.

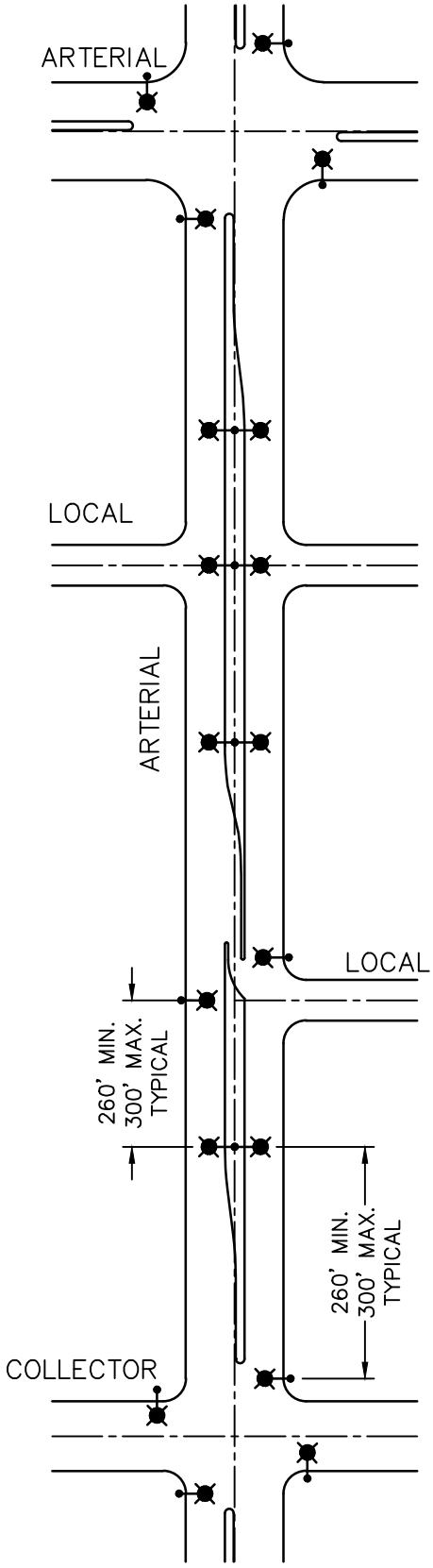
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ARTERIAL AND MAJOR COLLECTOR STREET LIGHTING

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NOTES:

1. STREET LIGHTS SHALL BE INSTALLED IN MEDIAN. STREET LIGHTS INSTALLED IN MEDIAN SHALL BE INSTALLED ON SINGLE OCTAGONAL POLES WITH A POLE HEIGHT OF 25'–9" AND SHALL HAVE DUAL MAST ARMS WITH A LENGTH OF 8' EACH.
2. INTERSECTIONS MAY BE SUPPLEMENTED WITH LIGHTING BEHIND CURB AND GUTTER IF MEDIAN LIGHTING CANNOT BE POSITIONED TO PROVIDE ADEQUATE ILLUMINATION.
3. STREETLIGHTS ON ARTERIAL STREETS SHALL BE LED – MINIMUM 16,000 LUMEN WITH CUT–OFF LUMINAIRES, LUMINAIRE ELEVATION OF 29', MOUNTED ON MARBLELITE POLES WITH 8' ALUMINUM MAST ARMS.
4. STREETLIGHTS ON MAJOR COLLECTOR STREETS SHALL BE LED – MINIMUM 9,500 LUMEN WITH CUT–OFF LUMINAIRES, LUMINAIRE ELEVATION OF 29', MOUNTED ON MARBLELITE POLES WITH 8' ALUMINUM MAST ARMS.
5. STREETLIGHTS SHALL BE INSTALLED AT LOCATIONS AS DETERMINED BY THE CITY ENGINEER UPON REVIEW OF SUBMITTED IMPROVEMENT PLANS.
6. STREETLIGHT SPACING SHALL BE 260' MINIMUM TO 300' MAXIMUM.
7. IF AN INTERSECTION IS SIGNALIZED, A STREETLIGHT SHALL BE INSTALLED ON EACH CORNER AS A PART OF THE TRAFFIC SIGNAL SYSTEM.
8. A STREETLIGHT PLAN PREPARED BY A LICENSED ENGINEER SHALL BE SUBMITTED TO THE CITY. THE PLAN SHALL INCLUDE LOCATIONS OF STREETLIGHTS, PULL BOXES, CONDUIT, METER PEDESTAL, POINT OF SERVICE, AND VOLTAGE DROP CALCULATIONS. THE LIGHTING SYSTEM MUST COMPLY WITH THE CURRENT NATIONAL ELECTRICAL CODE (NEC) AND THE CALIFORNIA ELECTRICAL CODE (CEC).
9. STREET LIGHTING SHALL BE DESIGNED TO MINIMIZE THE NUMBER OF METER PEDESTALS.
10. A "WILL SERVE" LETTER FROM SOUTHERN CALIFORNIA EDISON SHALL BE SUBMITTED TO THE CITY PRIOR TO APPROVAL OF STREET LIGHTING PLANS.
11. A MINIMUM SEPARATION OF 20' IS REQUIRED BETWEEN TREES AND STREETLIGHT POLES.
12. ALL STREETLIGHTS INSTALLED OR REPLACED IN THE CENTRAL BUSINESS DISTRICT ARE SUBJECT TO APPROVAL OF THE CITY ENGINEER.

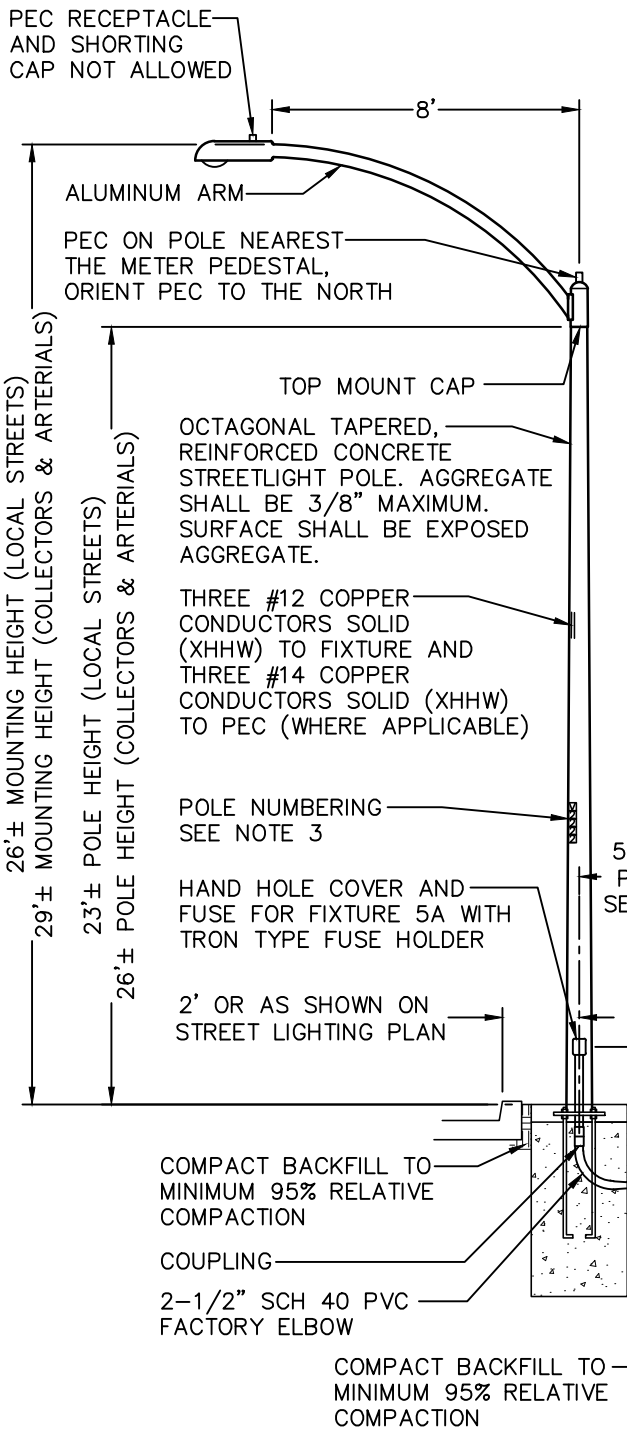
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ARTERIAL STREET LIGHTING WITH MEDIAN CURB

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NOTES:

1. ALL WORK SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE SPECIFICATIONS ENTITLED "STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, BUSINESS, TRANSPORTATION AND HOUSING AGENCY, DEPARTMENT OF TRANSPORTATION" AND THE NATIONAL ELECTRICAL CODE.
2. LUMINAIRE SHALL BE 120V LED, COBRA HEAD STYLE WITH TYPE II CUTOFF.
3. ALL STREETLIGHTS SHALL BE NUMBERED. NUMERICAL SEQUENCE TO BE OBTAINED FROM THE CITY OF VISALIA. EACH CHARACTER SHALL BE 2-1/2" TEXT HEIGHT. ALUMINUM TAGS SHALL BE INSTALLED VERTICALLY. THE BOTTOM TAG SHALL BE 10'-6" ABOVE FINISH GRADE.
4. FOR BASE PLATE AND FOUNDATION INFORMATION SEE STREETLIGHT FOUNDATION STANDARD DRAWING.
5. PULL BOX SHALL NOT BE INSTALLED WITHIN SIDEWALK, UNLESS APPROVED BY THE CITY ENGINEER.

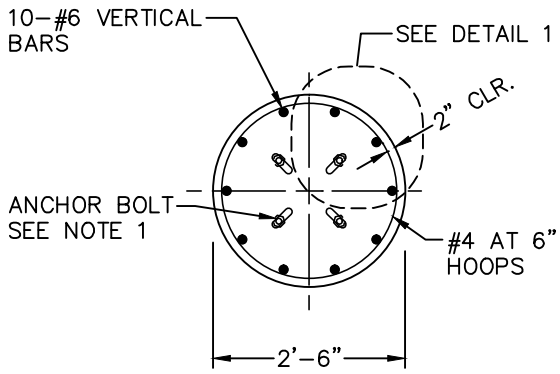
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DESIGN & IMPROVEMENT STANDARDS

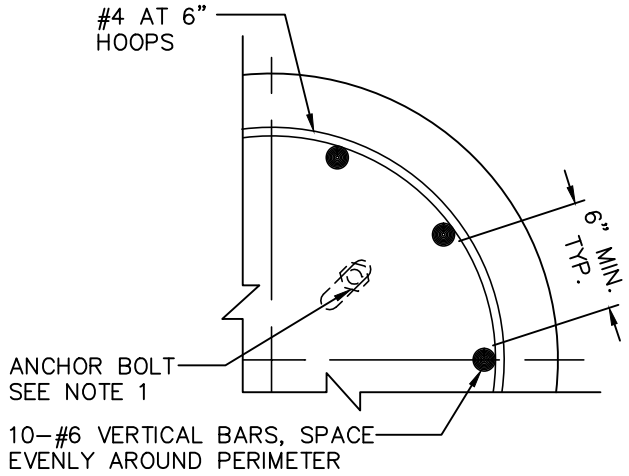
STREETLIGHT POLE

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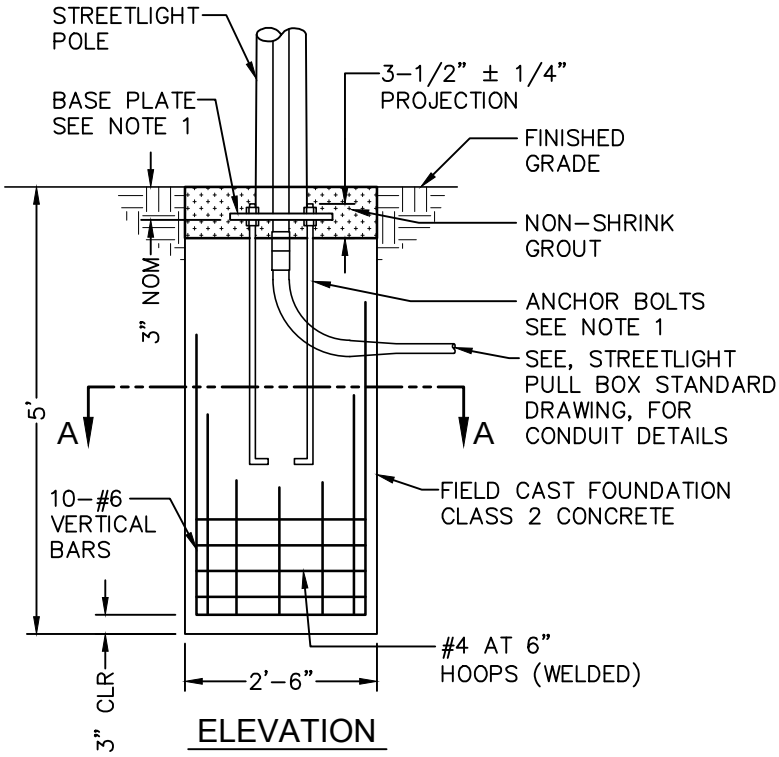
SL-5



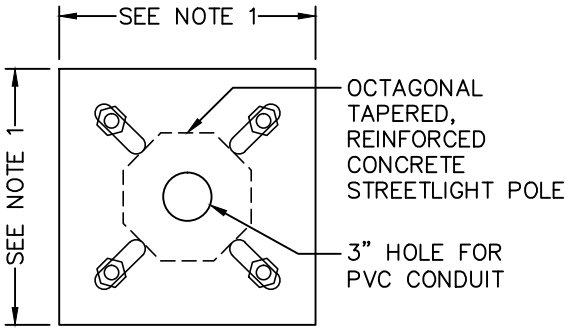
SECTION A-A



DETAIL 1



ELEVATION



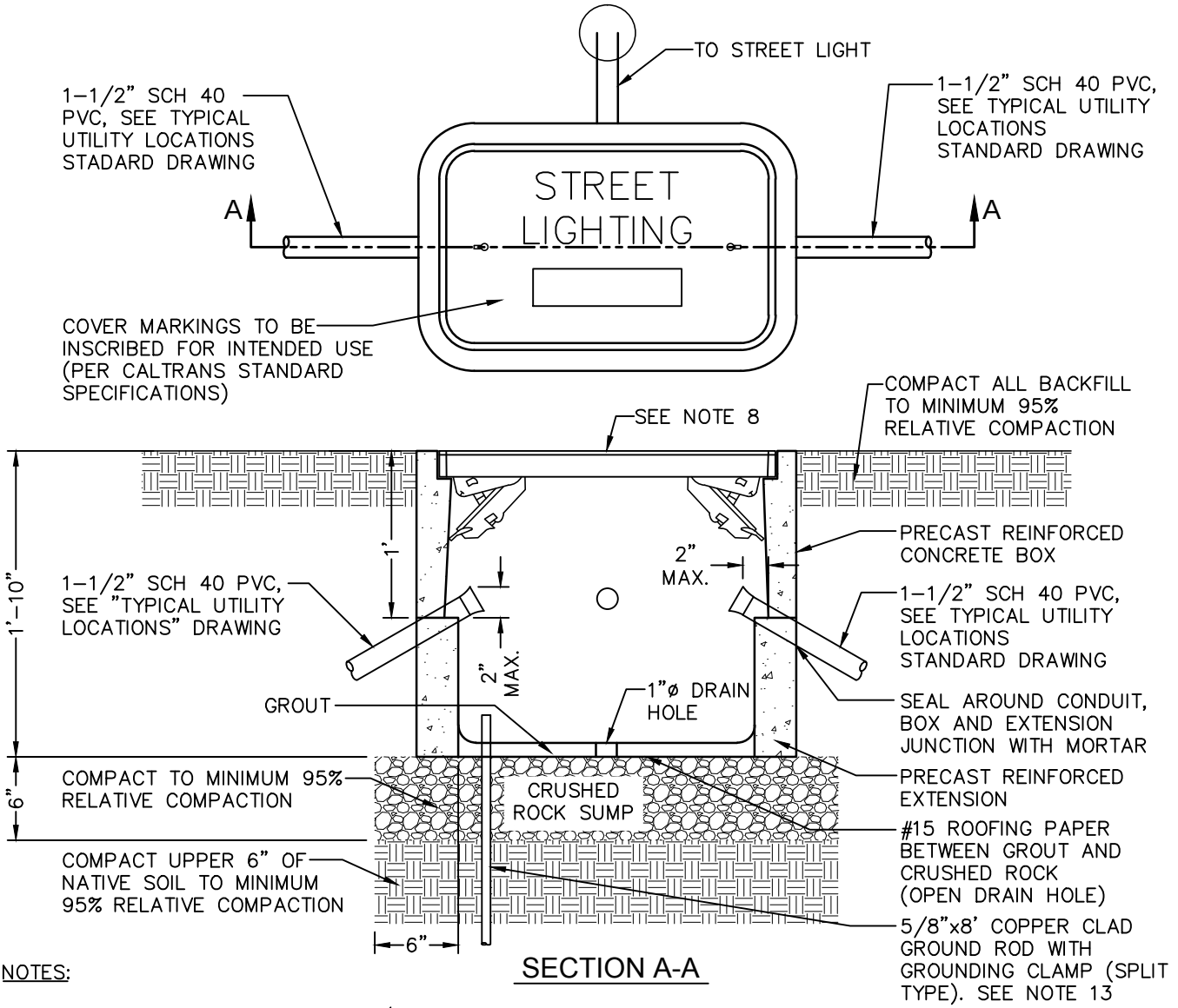
BASE PLATE DETAIL

CAST-IN-DRILLED HOLE PILE FOUNDATION
REINFORCED PILE

NOTE:

1. BASE PLATE AND ANCHOR BOLT DIMENSIONS PER MANUFACTURER SPECIFICATIONS. AT MINIMUM, ANCHOR BOLTS 1"ø x 36" x 4". INSTALL PER MANUFACTURERS RECOMMENDATION.

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STREETLIGHT FOUNDATION	REVISIONS 08/22/16 BK 2016 — SL–6



SECTION A-A

NOTES:

1. PULL BOXES SHALL BE NO. 3-1/2 UNLESS OTHERWISE NOTED ON PLANS.
2. PULL BOXES SHALL BE GROUTED PRIOR TO INSTALLATION OF CONDUCTORS. SLOPED TOWARD THE DRAIN HOLE. PLACE A LAYER OF ROOFING PAPER BETWEEN THE CRUSHED ROCK AND GROUT. OPEN AT DRAIN HOLE.
3. PULL LIDS BEFORE POURING CONCRETE AROUND PULL BOXES.
4. WRAP BOX WITH ROOFING PAPER BEFORE BACKFILLING.
5. PULL BOX SHALL BE TRAFFIC RATED PER CALTRANS STANDARDS IF NOT LOCATED BEHIND A CURB.
6. STREET LIGHT CONDUCTORS SHALL BE INSTALLED CONTINUOUS. SPLICES SHALL ONLY BE PERMITTED AT THE PULL BOX.
7. FIRMLY INSTALL DUCT SEAL AFTER INSTALLATION OF CONDUCTORS.
8. A LOCKING LID SHALL BE INSTALLED. LID SHALL BE GALVANIZED STEEL DIAMOND PLATE, MINIMUM THICKNESS 3/16", WITH MINIMUM TWO CLAMPING JAWS. DELIVER ONE KEY PER PROJECT TO THE CITY OF VISALIA REPRESENTATIVE OR AS DIRECTED BY THE CITY REPRESENTATIVE. LID SHALL BE LOCKJAW BRAND OR APPROVED EQUAL. LID SHALL BE BONDED PER CALTRANS STANDARDS FOR TRAFFIC RATED LIDS.
9. A MINIMUM OF 2' OF SLACK IN EACH CONDUCTOR SHALL BE LEFT IN EACH PULL BOX. TWIST AND PUSH TO BOTTOM OF PULL BOX TO PREVENT WIRE FROM PULLING THROUGH.
10. CONDUIT SHALL HAVE BELL ENDS. EMPTY CONDUITS SHALL BE CAPPED WITHOUT GLUE.
11. CONDUIT SHALL BE MANDREL TESTED AFTER BACKFILL AND COMPACTION IN THE PRESENCE OF THE CITY OF VISALIA REPRESENTATIVE.
12. REFER TO TYPICAL UTILITY LOCATIONS STANARD DRAWING FOR PLACEMENT OF STREET LIGHTING CONDUIT IN UTILITY TRENCHES.
13. GROUND RODS REQUIRED ONLY IN PULL BOX FARTHEST FROM THE METER PEDESTAL AND IN THE METER PEDESTAL.

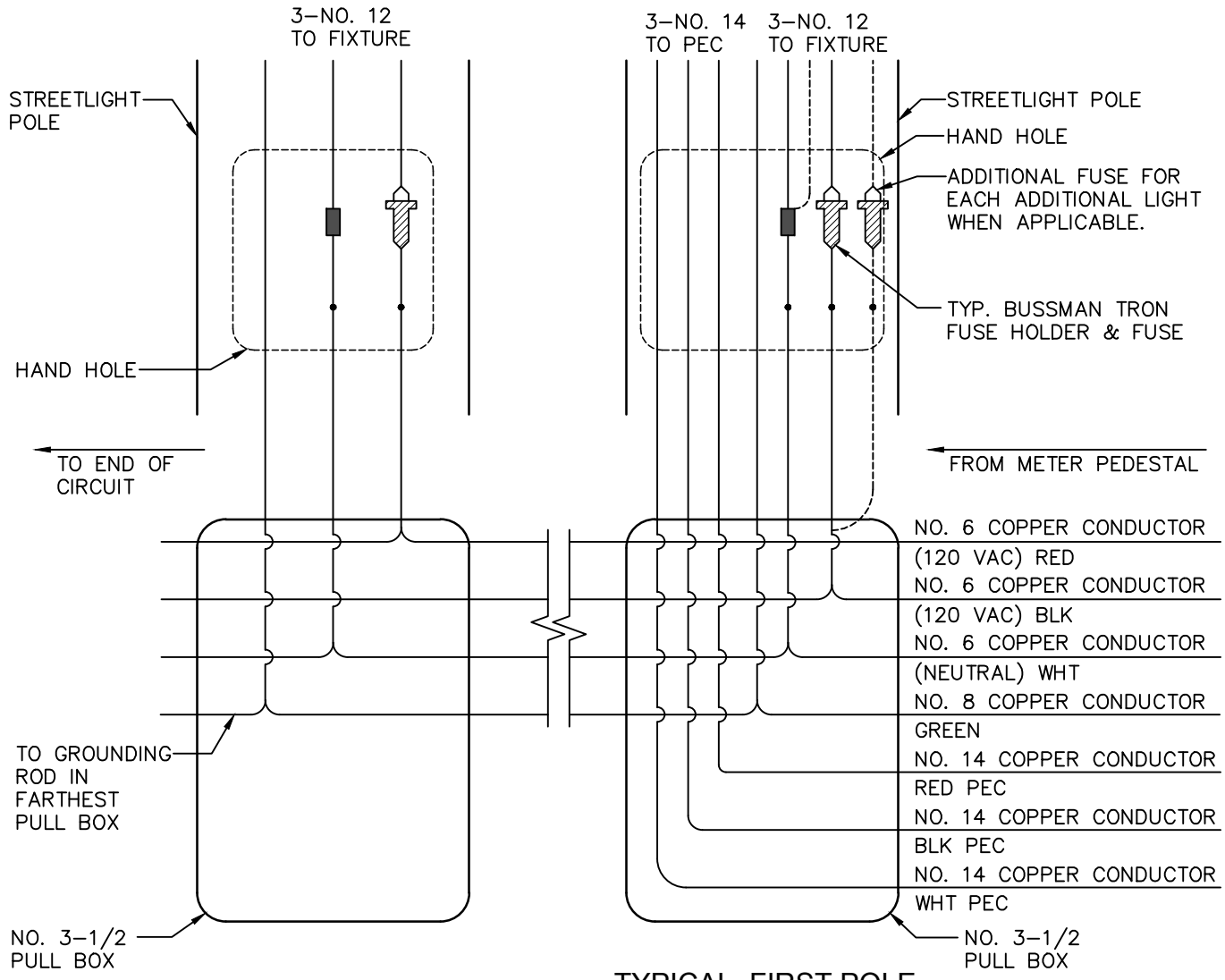
APPROVED BY: _____ 09/16/16
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

STREETLIGHT PULL BOX

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TYPICAL, POLE AND PULL BOX ALONG RUN

TYPICAL, FIRST POLE AND PULL BOX, NEAREST METER

NOTES:

1. ALL CONDUCTORS SHALL BE (XHHW) TYPE, OR AS APPROVED BY CITY ENGINEER.
2. VOLTAGE DROP CALCULATIONS SHALL BE PERFORMED BY A LICENSED ENGINEER AND SUBMITTED TO THE CITY OF VISALIA FOR REVIEW.
3. 240V CIRCUITS ARE NOT STANDARD BUT MAY BE USED IF WARRANTED BY SPECIAL CIRCUMSTANCES. 240V CIRCUITS REQUIRE APPROVAL OF THE CITY ENGINEER AND SHALL BE DESIGNED BY A LICENSED ENGINEER.
4. SPLICES SHALL BE PER CALTRANS STANDARD PLAN ES–13A, TYPE "S" OR TYPE "ST" AS APPLICABLE. SPLICES SHALL BE INSULATED IN ACCORDANCE WITH METHOD "B".
5. SPLIT BOLT CONNECTOR (KEARNEY CONNECTORS, OR EQUAL), MAY BE USED TO SPLICE NO. 8 CONDUCTORS OR LARGER WITH METHOD "B" INSULATION.
6. WIRE NUTS ARE NOT ALLOWED FOR SPLICING.
7. THIS WIRING DIAGRAM DOES NOT SHOW THE SEPARATE GFI CIRCUIT REQUIRED IN THE DOWNTOWN AREA.

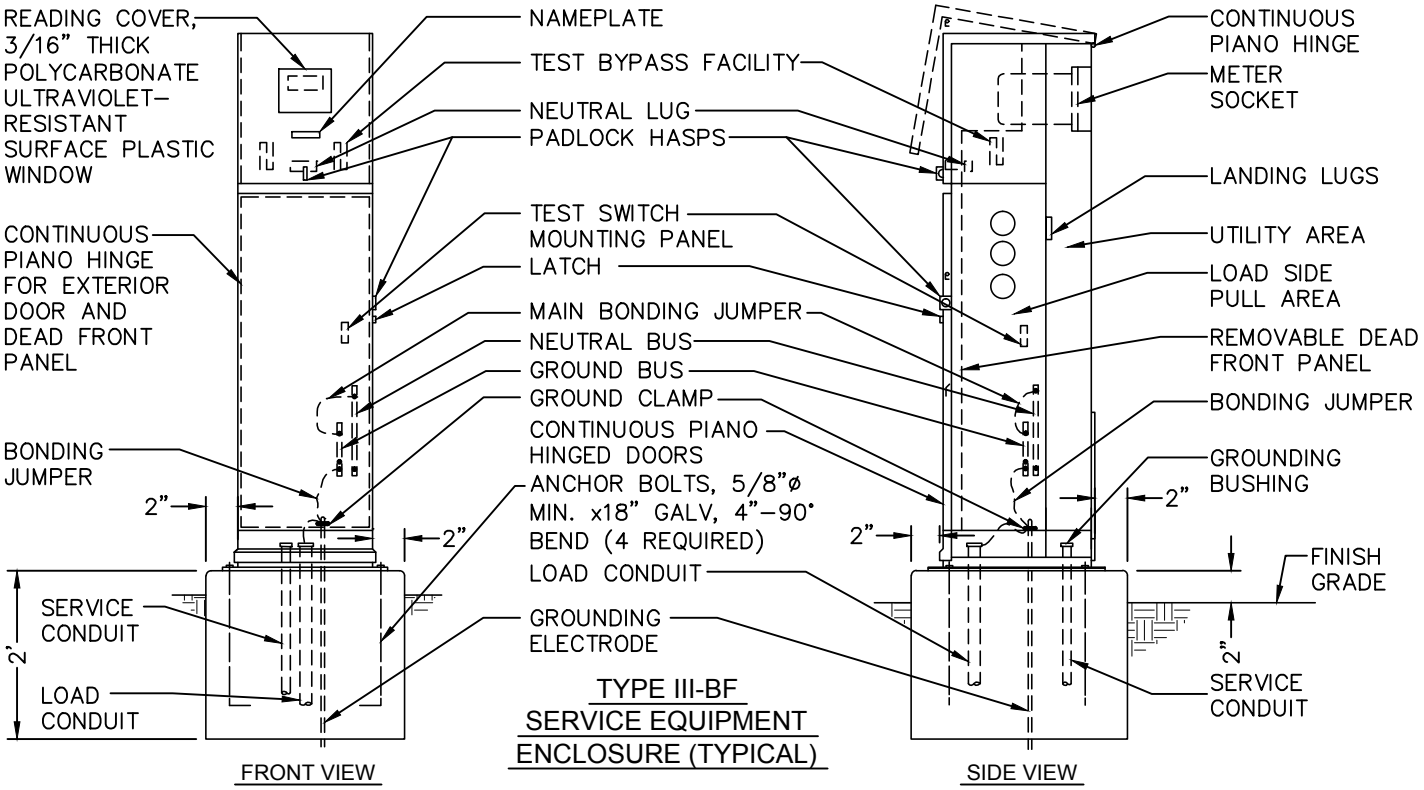
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

STREETLIGHT CONNECTION DIAGRAM

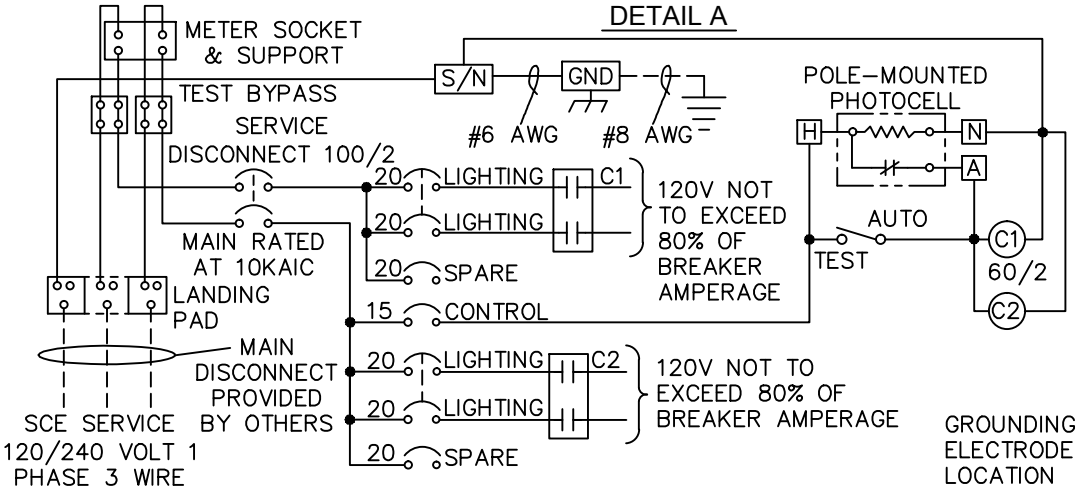
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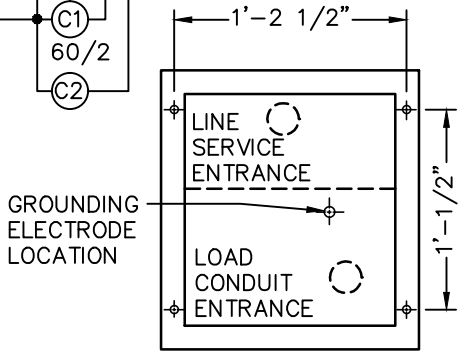
TYPE III-BF SERVICE EQUIPMENT ENCLOSURE (TYPICAL)

DETAIL A



NOTE: LOAD CURRENT FOR ALL BREAKERS NOT TO EXCEED 80% OF BREAKER AMPERAGE

SERVICE EQUIPMENT WIRING DIAGRAM



FRONT

BASE FOR TYPE III-B SERVICE EQUIPMENT ENCLOSURE

DETAIL B

ENCLOSURE CONSTRUCTION NOTES:

1. EXTERIOR, 1/8" ALUMINUM, AND INTERIOR 14 GA COLD ROLLED STEEL, ELECTRICALLY WELDED AND REINFORCED WHERE REQUIRED.
2. CONSTRUCTION WILL BE NEMA 3R, RAINTIGHT.
3. ALL NUTS, BOLTS AND SCREWS WILL BE STAINLESS STEEL.
4. NUTS, BOLTS & SCREWS WILL NOT BE VISIBLE FROM OUTSIDE OF ENCLOSURE.
5. NAMEPLATES WILL BE PROVIDED AS REQUIRED.
6. CONTROL WIRING WILL BE MARKED AT BOTH ENDS BY PERMANENT WIRE MARKERS.
7. A PLASTIC COVERED WIRING DIAGRAM WILL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.
8. ENCLOSURE WILL BE FACTORY WIRED AND CONFORM TO REQUIRED NEMA AND UL 508A STANDARDS.
9. COLOR TO BE: ANODIZED ALUMINUM
10. CONDUIT FROM SOUTHERN CALIFORNIA EDISON (SCE) POINT OF SERVICE SHALL BE 3" SCH. 80 PVC WITH A PULL ROPE PER SCE STANDARDS.
11. METER PEDESTAL SHALL CONFORM TO EUSERC DRAWING NO. 308.

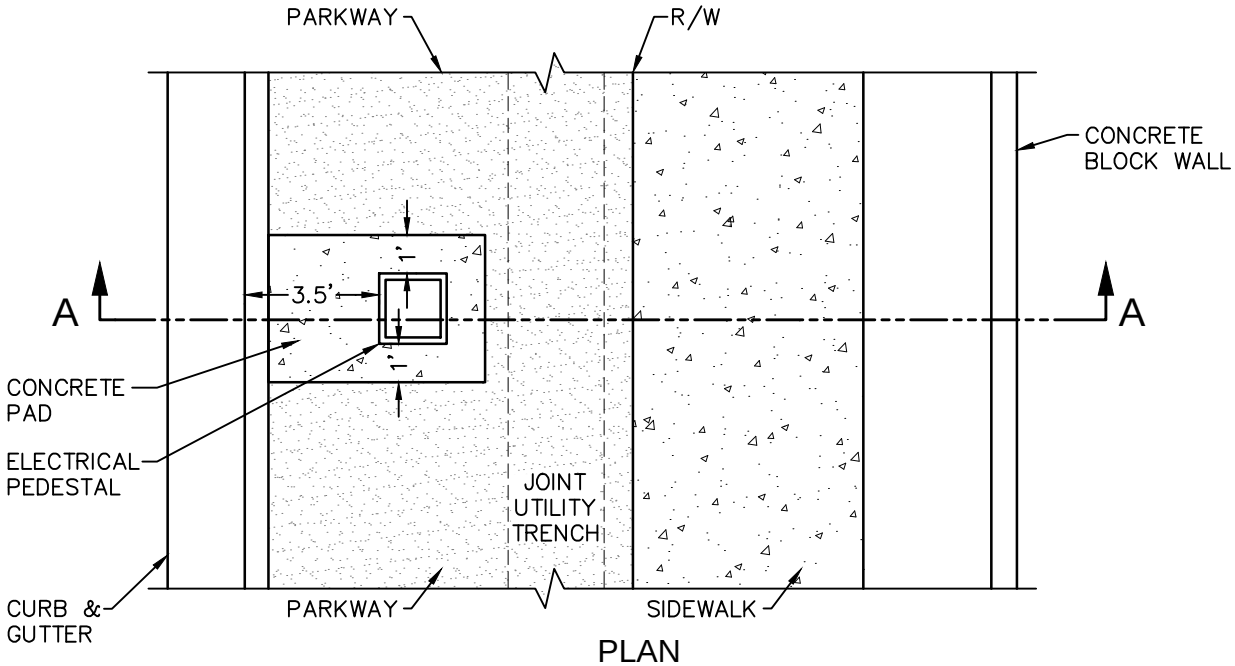
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

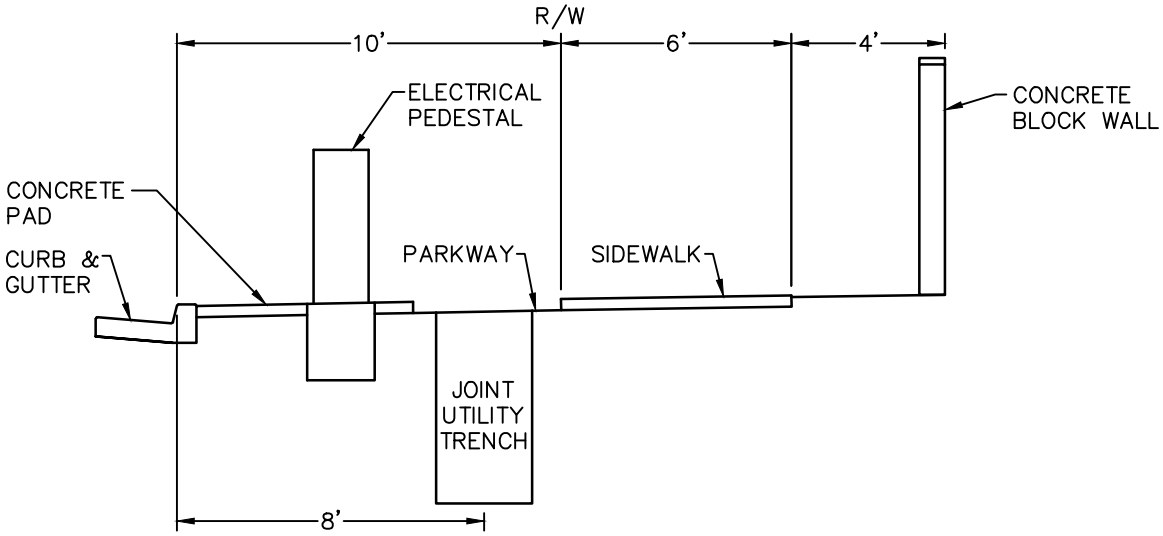
STREETLIGHT METER PEDESTAL TYPE III-BF

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PLAN



SECTION A-A

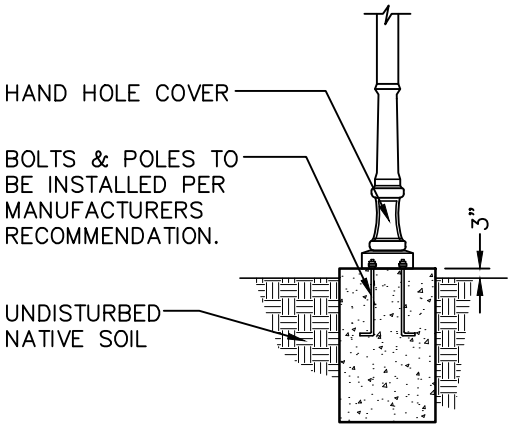
NOTES:

1. ALL CONCRETE SHALL BE CLASS 3 CONCRETE.
2. A PLASTIC COVERED SET OF ELECTRICAL PLANS SHALL BE ATTACHED TO THE INSIDE OF THE FRONT DOOR.

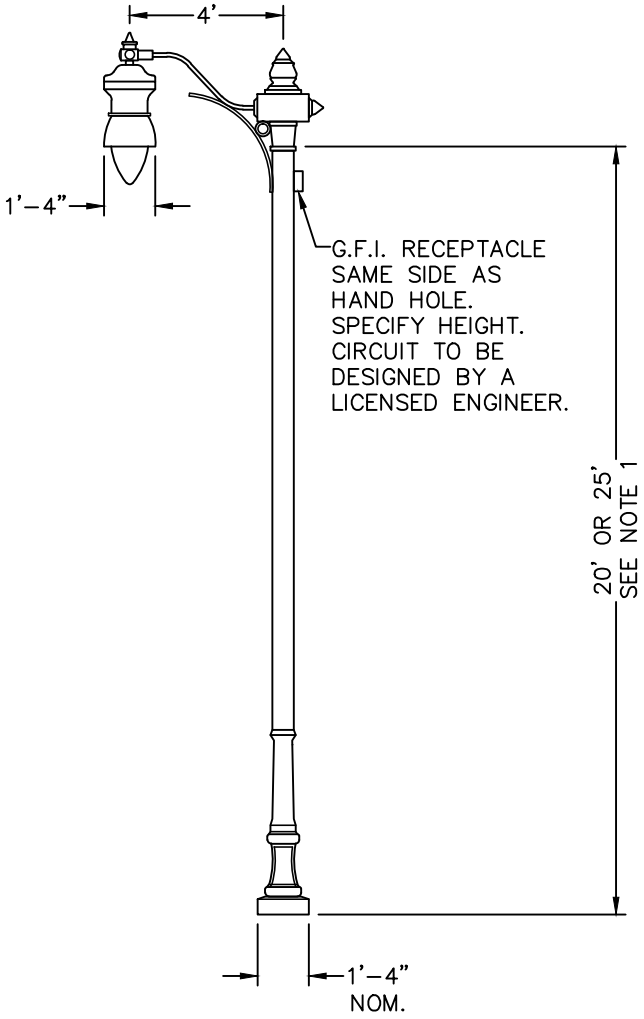
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
ELECTRICAL PEDESTAL LOCATION FOR COLLECTOR AND ARTERIAL STREETS	REVISIONS 08/23/16 BK 2016 — SL–10

NOTES:

1. DOWNTOWN AND TRANSIT AREA STREET LIGHT HEIGHT WILL BE 25'. RESIDENTIAL STREET LIGHT HEIGHT WILL BE 20'.
2. MEDIAN STREET LIGHTS WILL BE DUAL HEAD.
3. POLE SHALL BE STEEL.
4. MANUFACTURER AND MODEL NUMBER SHALL BE PROVIDED TO THE CITY FOR REVIEW. VISUAL CHARACTERISTICS SHALL BE SIMILAR TO POLES CURRENTLY EXISTING IN THE CITY OF VISALIA.
5. LUMINAIRE SHALL BE LED.
6. USE OF ORNAMENTAL STREETLIGHTS IS RESTRICTED AND SHALL BE APPROVED BY THE CITY ENGINEER.
7. FOR FOUNDATION INFORMATION SEE STREETLIGHT FOUNDATION STANDARD DRAWING.



SECTION



ELEVATION

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ORNAMENTAL STREETLIGHT 1 OF 2

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SPECIFICATIONS

LUMINAIRE:	SEALED LED OPTICAL MODULE, LOW COPPER A356 ALLOY (<0.2% COPPER) CAST ALUMINUM HOUSING. TOP AND BOTTOM ARE HINGED FOR ACCESS WITH SEPARATE DRIVER AND LED COMPARTMENTS.
VLED OPTICAL MODULE:	SEALED LED OPTICAL MODULE, LOW COPPER A356 ALLOY (<0.2% COPPER) CAST ALUMINUM HOUSING, INTEGRATED CLEAR PRISMATIC BOROSILICATE GLASS REFRACTOR SEALED WITH A CONTINUOUS SILICONE GASKET. ENTIRE MODULE MUST MEET IP67 RATING.
VLED EMITTERS AND OPTICS:	80 LUXEON T EMITTERS (LED'S) DRIVEN AT 525 mA FOR 132 TOTAL INPUT WATTS. HIGHT OUTPUT, NEUTRAL WHITE NOMINAL 4000K CCT FOR THE ENTIRE MODULE. EACH EMITTER TO BE OPTICALLY CONTROLLED BY A REFLECTOR–PRISM INJECTION MOLDED FROM H12 ACRYLIC. REFLECTOR–PRISMS TO BE ARRAYED TO PRODUCE IES TYPE III LIGHT DISTRIBUTION. OPTICAL MODULE TO BE FIELD ROTABLE IN THE LUMINAIRE.
VLED DRIVER:	CONSTANT CURRENT LED DRIVER OPERATES ON INPUT VOLTAGES FROM 120–277 V., 50/60 Hz. FACTORY WIRED DRIVER TO BE INDEPENDENTLY SEALED AND UL LISTED FOR WET LOCATIONS. 20 KA SURGE PROTECTOR WITH "ON" LED OPERATIONAL INDICATER AND END OF LIFE OPEN CIRCUIT PROTECTION FOR LUMINAIRE.
ARM:	DURABLE CORROSION RESISTANT, ALUMINUM CONSTRUCTION.
SHAFT:	16 SHARP FLUTE, ROUND TAPERED STEEL SHAFT WITH 7.0" BUTT TAPERING TO 3.5" TOP (11 GAGE). MINIMUM YIELD STRENGTH 55,000 P.S.I. HAND HOLE WITH COVER AT 20" FROM BOTTOM OF BASE PLATE. SHAFT TO BE PROVIDED WITH 42" SMOOTH BOTTOM SECTION.
ANCHOR BASE:	FABRICATED FROM STRUCTURAL QUALITY HOT ROLLED STEEL. BASE TELESCOPES AND TO BE CIRCUMFERENTIALLY WELDED TO SHAFT.
BASE COVER:	TWO PIECE WRAPAROUND, CORROSION RESISTANT, DURABLE CAST ALUMINUM CONSTRUCTION. MINIMUM 0.250 WALL THICKNESS. BASE CONSISTS OF A SMOOTH TAPERED BOTTOM SECTION AND A DECORATIVE TAPERED FLUTED SECTION WITH EVENLY SPACED RAISED VERTICAL FLUTES. BASE TO BE FURNISHED WITH A CONTOURED, FLUTED FLUSH HAND HOLE AND COVER. HAND HOLE COVER TO INCLUDE TAMPER RESISTANT HARDWARE. (4) 1/4" – 20 SET SCREWS PROVIDED TO SECURE DECORATIVE BASE TO SHAFT.
ANCHORAGE:	(4) 1" X 36" ANCHOR BOLT, EACH SUPPLIED WITH TWO NUTS AND TWO WASHERS.
FINISH:	FIXTURE, ARM, AND BASE: POLYESTER POWDER COAT. (COLOR: GREEN TEXTURED, RAL–6005–T) OR APPROVED EQUAL. POLE ASSEMBLY: POLYESTER POWDER COAT. (COLOR: GREEN, SMOOTH, RAL–6005) OR APPROVED EQUAL.

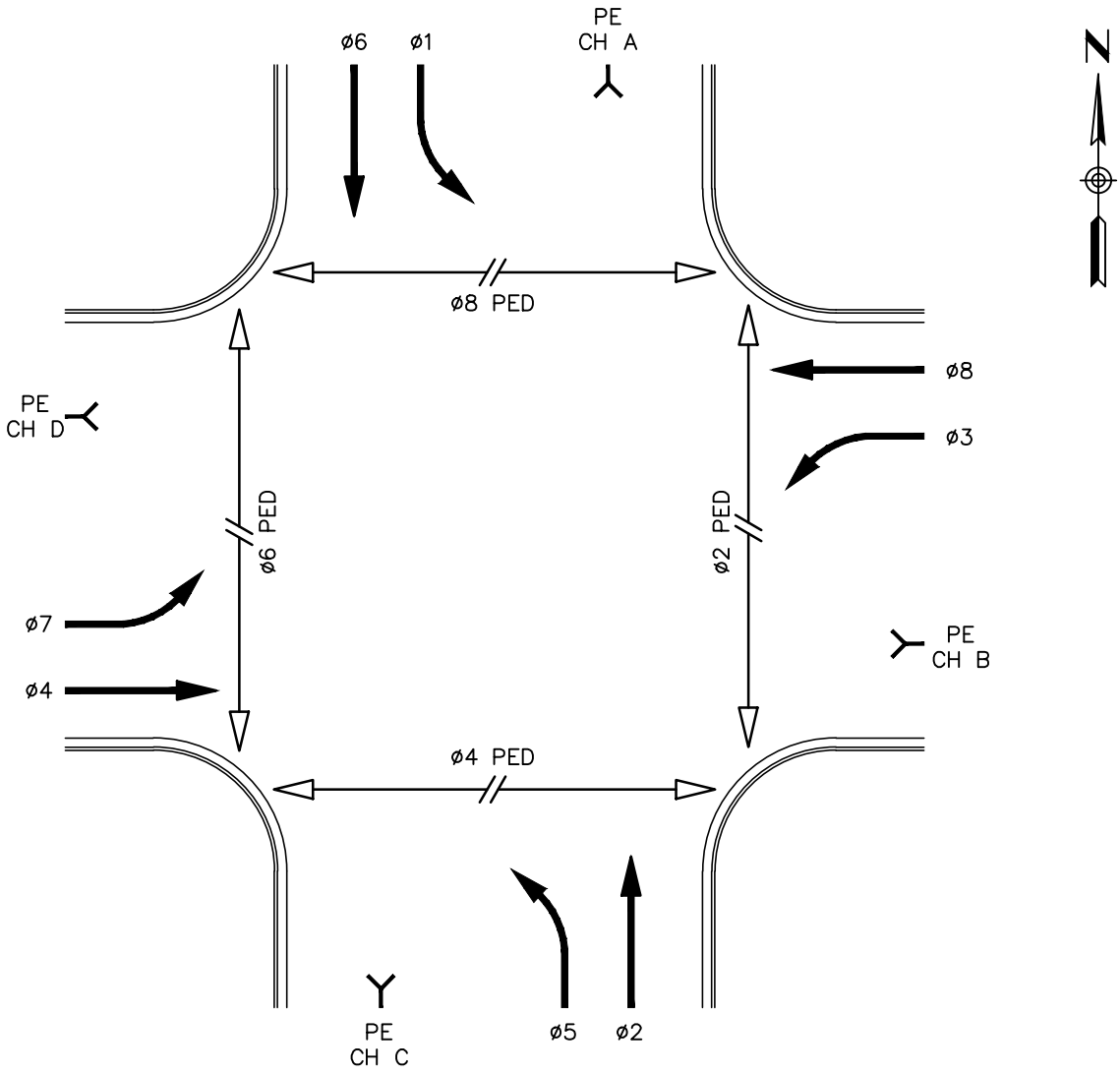
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ORNAMENTAL STREETLIGHT 2 OF 2

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PREEMPTION (PE) CHANNELS

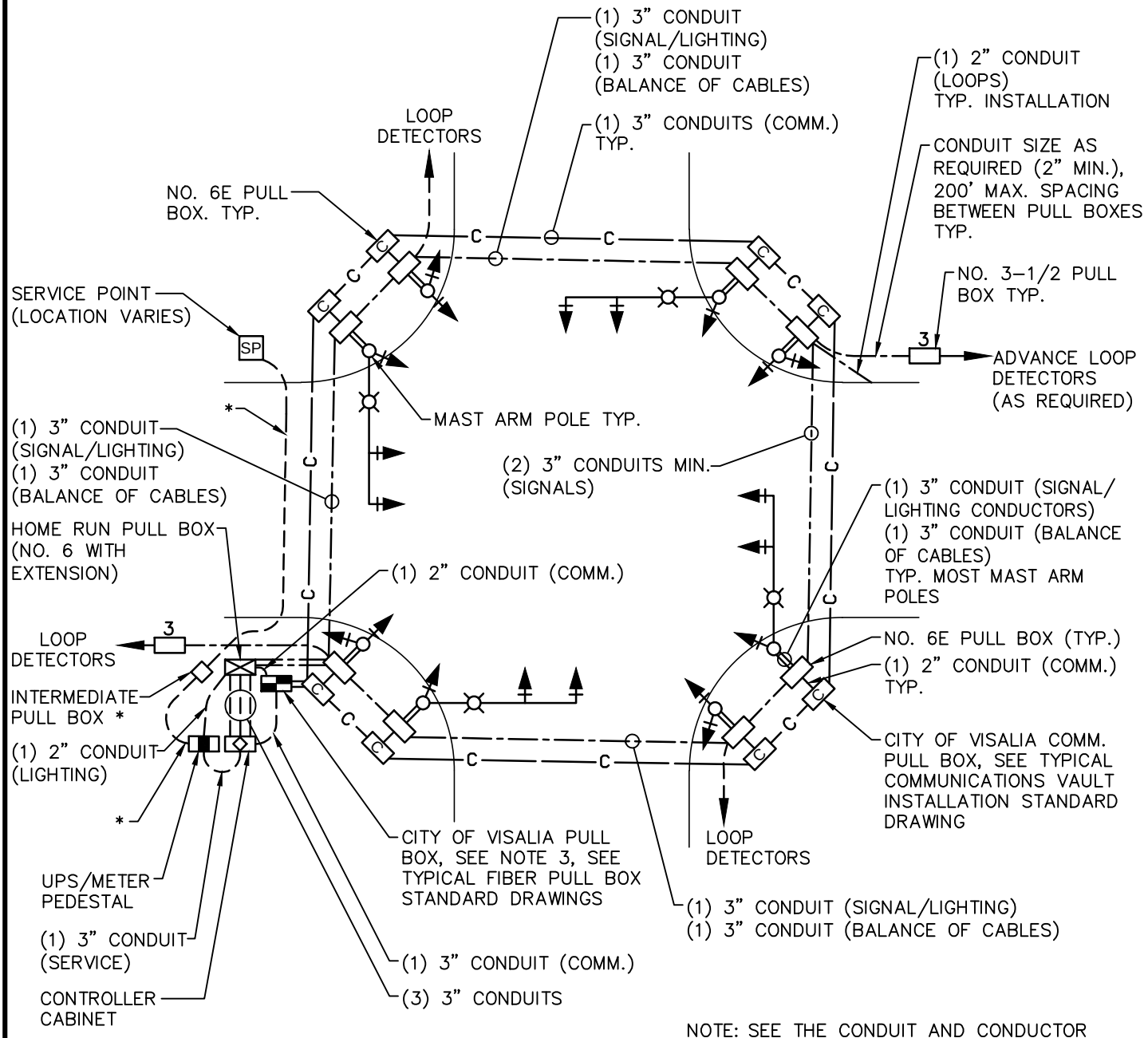
PE CHANNEL A = NB PREEMPTOR 3 (ø2)
PE CHANNEL B = EB PREEMPTOR 4 (ø4)
PE CHANNEL C = SB PREEMPTOR 5 (ø6)
PE CHANNEL D = WB PREEMPTOR 6 (ø8)

EVP A = ø2 + ø5
EVP B = ø4 + ø7
EVP C = ø6 + ø1
EVP D = ø8 + ø3

NOTES:

1. PHASE 2 IS ALWAYS NORTHBOUND, REGARDLESS OF STREET CLASSIFICATION.

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STANDARD TRAFFIC SIGNAL PHASING	REVISIONS 08/25/16 BK 2016 — TE–1



NOTE: SEE THE CONDUIT AND CONDUCTOR SCHEDULE ON THE PROJECT SPECIFIC PLANS FOR THE WIRING AND CONDUIT SIZES.

LEGEND:

* = PER ELECTRICAL UTILITY REQUIREMENTS

NOTES:

1. DRAWINGS ACCURATE FOR CONDUIT INFORMATION ONLY.
2. CONDUITS FOR LOOP DETECTORS ARE TYPICAL FOR ALL QUADRANTS.
3. WHEN CONDUIT AND PULL BOXES ARE BEING CONSTRUCTED PRIOR TO TRAFFIC SIGNAL DESIGN AND INSTALLATION, CITY OF VISALIA COMMUNICATION PULL BOXES SHALL BE INSTALLED ON ALL CORNERS OR AS DIRECTED BY THE CITY ENGINEER.
4. ALL EMPTY CONDUITS SHALL HAVE A #12 TRACING WIRE INSTALLED.

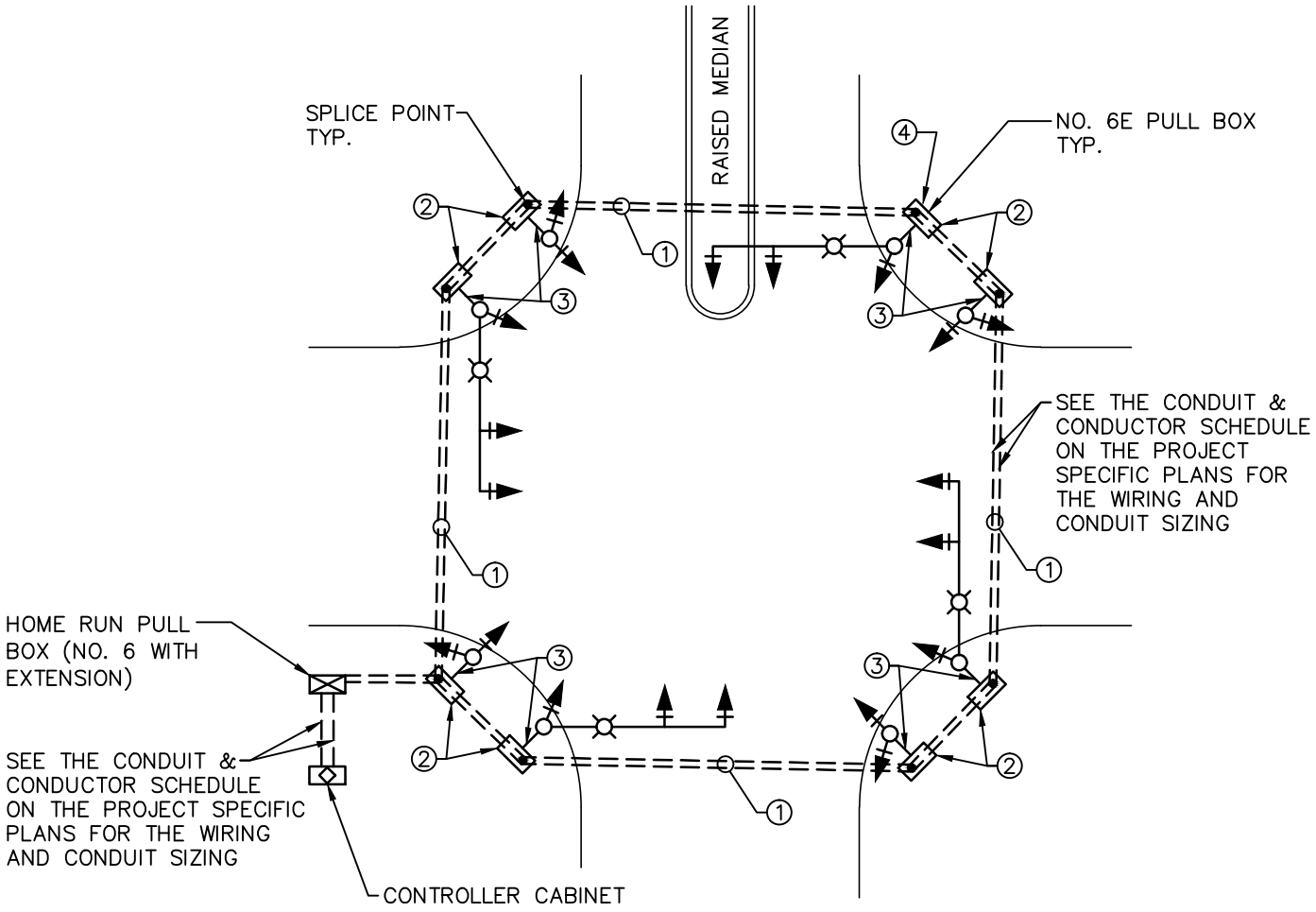
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TYPICAL TRAFFIC SIGNAL CONDUIT SCHEMATIC

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TE-2



NOTES:

1. DRAWINGS ACCURATE FOR CABLING INFORMATION ONLY.

CONSTRUCTION NOTES:

① SPLICE PERMITTED ONLY AT DESIGNATED SPLICE LOCATIONS AS SHOWN ON THIS PLAN. EACH SIGNAL CABLE IN USE AS SHOWN SHALL BE CONTINUOUS AND UNSPLICED BETWEEN PULL BOXES.

② PROVIDE 1 WRAP OF SLACK (3' MIN.) FOR EACH SIGNAL CABLE IN EACH PULL BOX. TERMINATE BETWEEN PULL BOXES.

③ LINE REPRESENTS CABLING AS SHOWN IN TRAFFIC SIGNAL WIRING SCHEMATIC STANDARD DRAWING.

④ INSTALL A GROUNDING ROD IN THE PULL BOX OPPOSITE THE TRAFFIC SIGNAL CABINET.

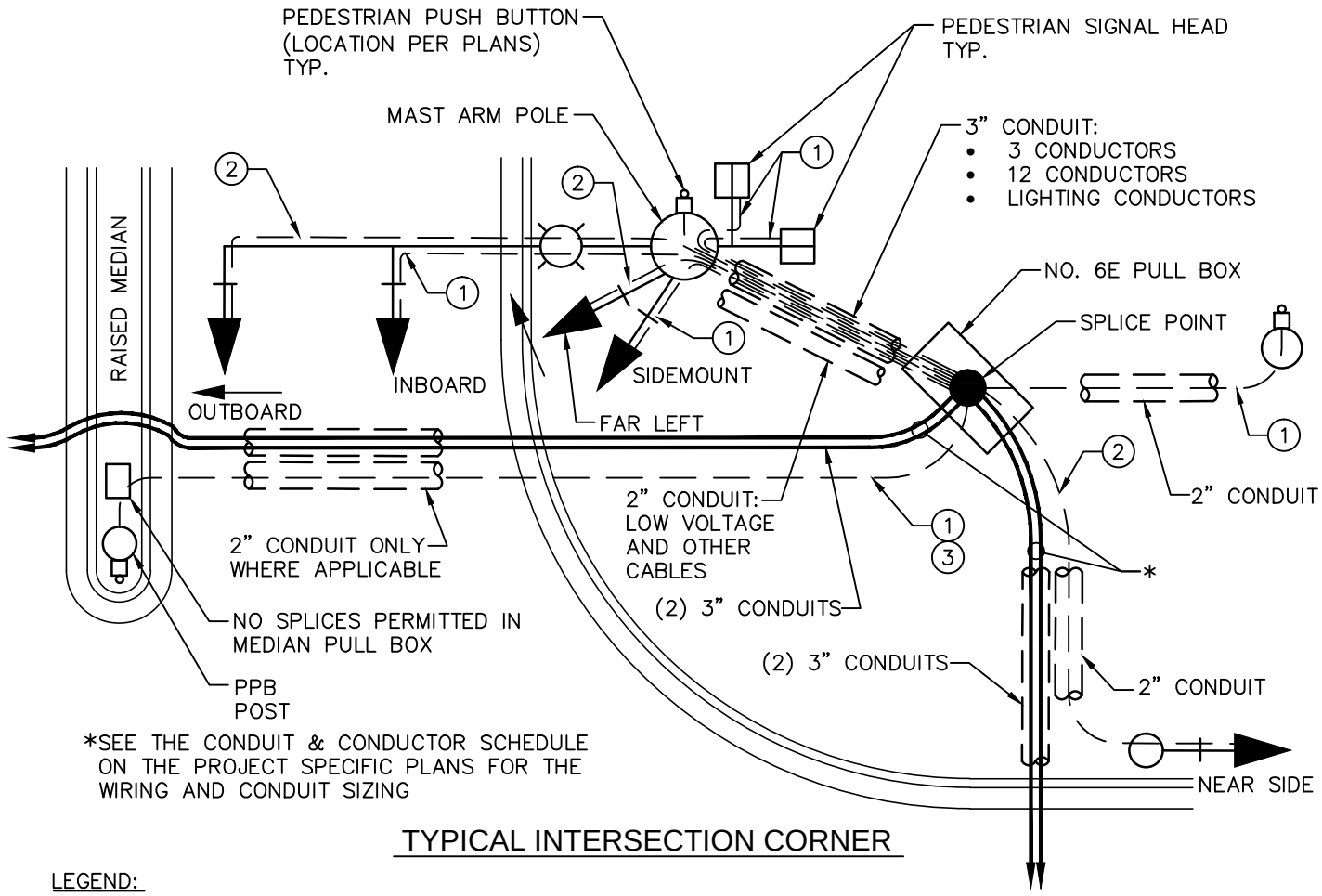
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TYPICAL TRAFFIC SIGNAL CABLE SCHEMATIC

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TE-3



TYPICAL INTERSECTION CORNER

LEGEND:

— — EXISTING 3 OR 12CSC CONDUCTOR (IMSA 19–1)

——— PROPOSED 3 OR 12CSC CONDUCTOR (IMSA 19–1)

NOTES:

1. QUANTITY OF CABLES MAY VARY BASED ON ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE CITY ENGINEER.
2. DRAWING ACCURATE FOR WIRING INFORMATION ONLY.

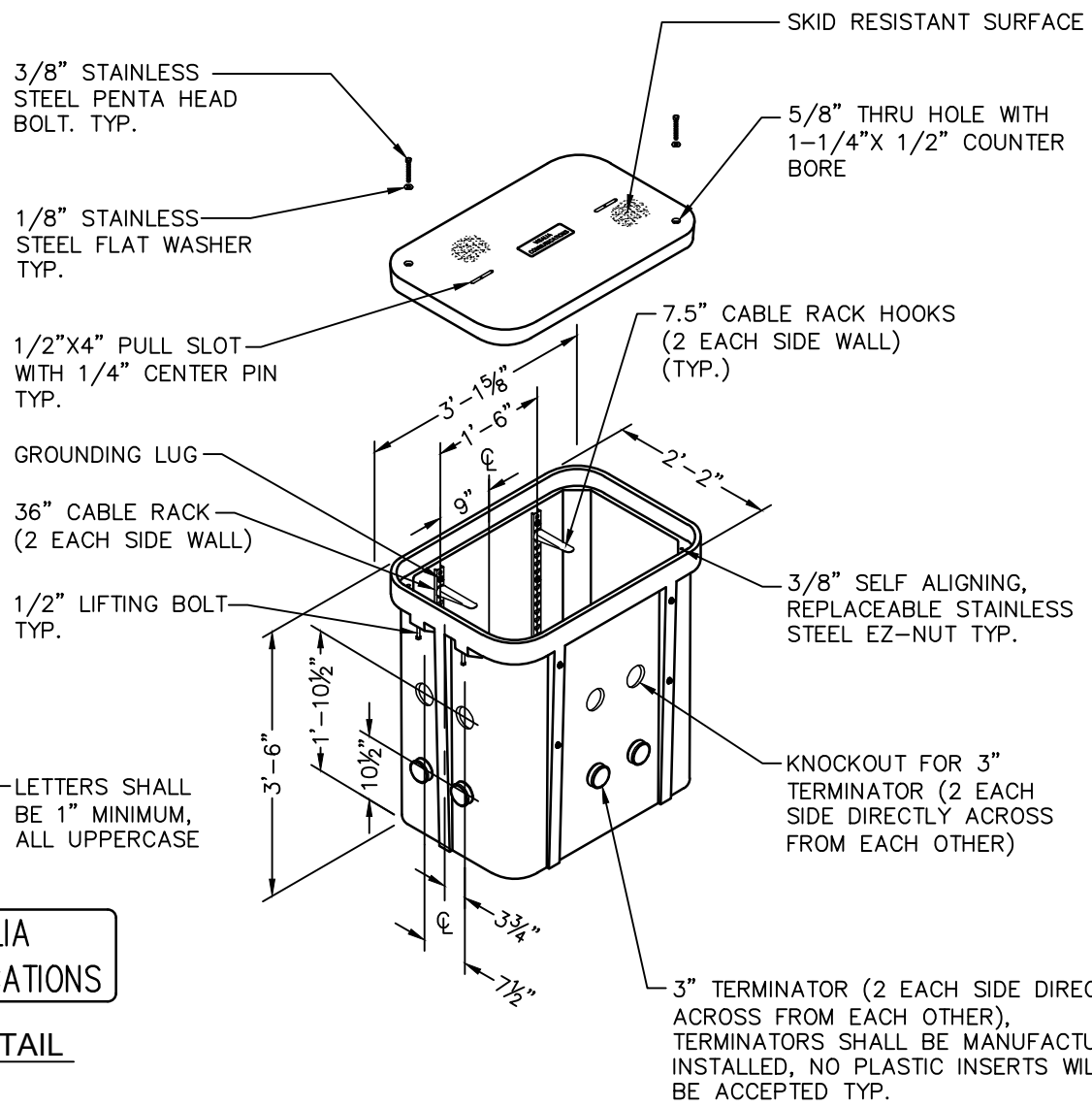
CONSTRUCTION NOTES:

(1) INSTALL 3 OR 12CSC CONDUCTOR (IMSA 19–1) CABLE CONTINUOUS AND UNSPLICED AS SHOWN FROM PULL BOX TO EACH OF THE FOLLOWING:
- SIDEMOUNT VEHICULAR SIGNAL
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- INBOARD

(2) INSTALL 3 OR 12CSC CONDUCTOR (IMSA 19–1) CABLE CONTINUOUS AND UNSPLICED AS SHOWN FROM PULL BOX TO EACH OF THE FOLLOWING:
- OUTBOARD VEHICULAR SIGNAL
- FAR LEFT MOUNTED VEHICULAR SIGNAL
- NEAR SIDE/RIGHT TURN OVERLAP VEHICULAR SIGNAL

(3) CONDUCTORS TO MEDIAN SHALL BE SPLICED IN THE BULL BOX ON THE ADJACENT CORNER IN THE CLOCKWISE DIRECTION FROM THE MEDIAN.

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TRAFFIC SIGNAL WIRING SCHEMATIC	REVISIONS 08/24/16 BK 2016	TE–4



VISALIA COMMUNICATIONS

LOGO DETAIL

PLAN SYMBOL:

[C] NEW

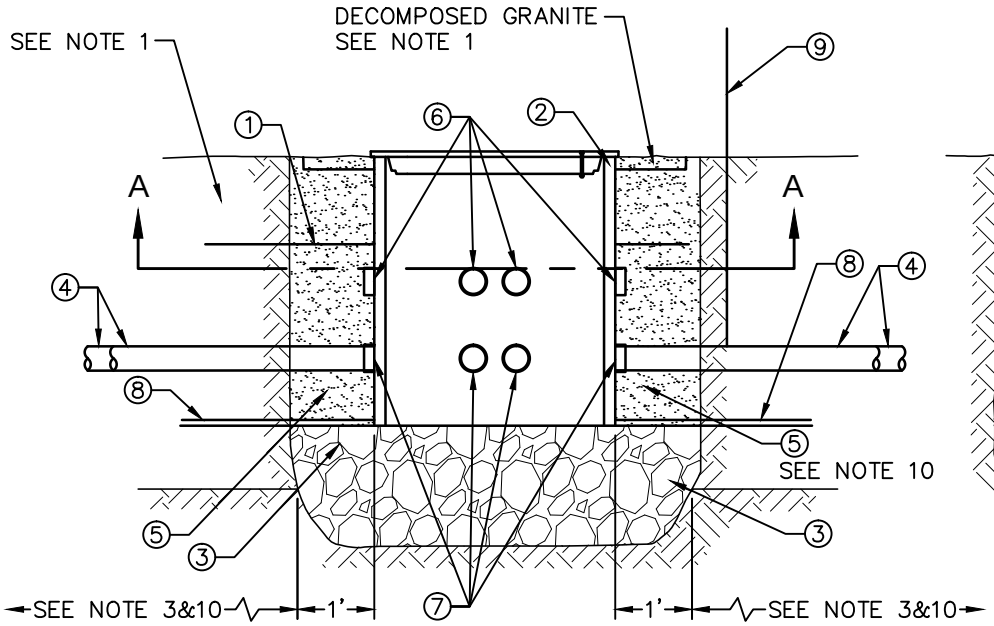
[C] EXISTING

TYPICAL PULL BOX

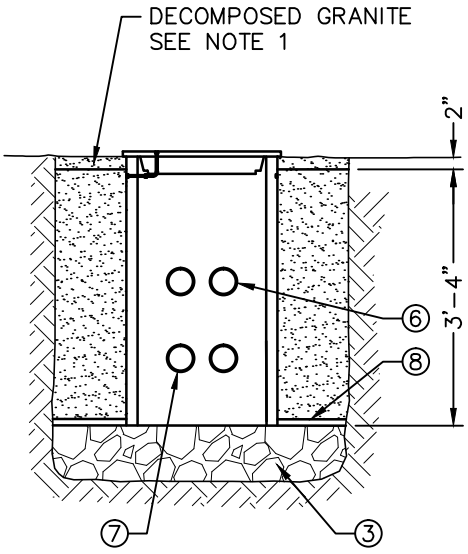
NOTE:

THE BOX OF THIS ASSEMBLY SHALL MEET BOTH PERFORMANCES AND TESTING OF ANSI/SCTE 77 TIER 15. INDEPENDENT THIRD PARTY VERIFICATION OF TEST REPORTS STAMPED BY A REGISTERED PROFESSIONAL ENGINEER CERTIFYING THAT ALL TEST PROVISIONS OF THIS SPECIFICATION HAVE BEEN MET ARE REQUIRED WITH EACH SUBMITTAL. SEE THE FOLLOWING TYPICAL FIBER PULL BOX STANDARD DRAWINGS FOR INSTALLATION INFORMATION.

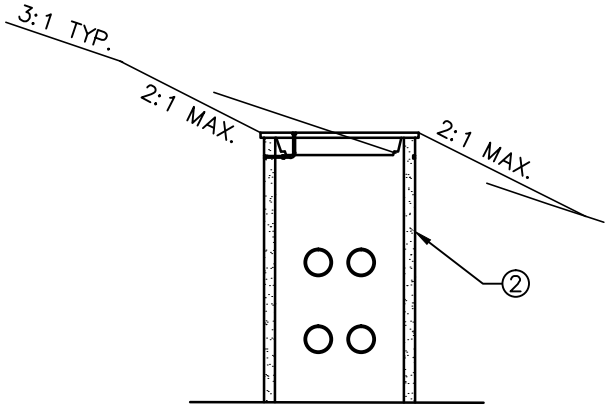
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
TYPICAL FIBER PULL BOX	REVISIONS 09/09/16 BK 2016 — TE-5



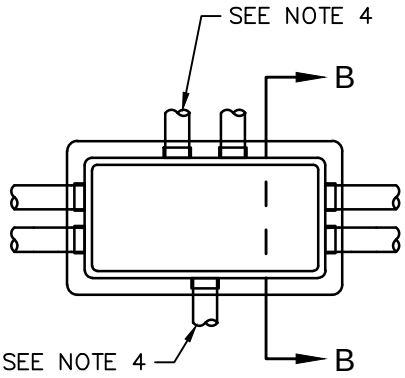
INSTALLATION FOR FIBER PULL BOX



SECTION B-B



INSTALLATION ON SLOPE



SECTION A-A

MATERIAL LIST

ITEM	DESCRIPTION
①	WARNING TAPE–"CAUTION FIBER OPTIC LINE BURIED BELOW"
②	CITY OF VISALIA FIBER PULL BOX – SEE TYPICAL FIBER PULL BOX STANDARD DRAWINGS
③	3/4" CLEAN CRUSHED ROCK
④	3" DIAMETER SCHEDULE 40 PVC CONDUITS
⑤	CONTROLLED LOW STRENGTH MATERIAL–SEE NOTE 10
⑥	3" TERMINATOR KNOCK OUT – SEE TYPICAL FIBER PULL BOX STANDARD DRAWINGS
⑦	3" TERMINATOR
⑧	30# FELT PAPER & GALVANIZED STEEL SCREEN – SEE NOTE 8
⑨	PULL BOX DELINEATOR (FLEXIBLE IDENTIFICATION MARKER)–SEE NOTE 9

NOTES:

1. SEE TYPICAL FIBER TRENCH DETAILS STANDARD DRAWING AND TYPICAL FIBER TRENCH & STREET LIGHT JOINT TRENCH DETAIL STANDARD DRAWING FOR TRENCH REQUIREMENTS.
2. SEE TYPICAL FIBER PULL BOX INSTALLATION NOTES STANDARD DRAWING FOR ADDITIONAL NOTES.
3. STRICTER REQUIREMENTS AS DIRECTED BY THE CITY ENGINEER IF PULL BOX IS WITHIN ROADWAY.

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TYPICAL FIBER PULL BOX INSTALLATION 1 OF 2

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TYPICAL FIBER PULL BOX INSTALLATION NOTES:

1. BACKFILL WITH DESIGNATED 3/4" CLASS 2 AGGREGATE BASE TO SIX (6) INCHES BELOW FINISH GRADE. BACKFILL WITH FOUR (4) INCHES OF WITH SELECT EXCAVATED MATERIAL AND THOROUGHLY COMPACT. TWO (2) INCHES OF DECOMPOSED GRANITE SHALL BE USED TO MATCH SLOPES.
2. THIS PULL BOX IS DESIGNED FOR NON-TRAFFIC AREAS.
3. CONDUIT FROM THE TYPICAL TRENCH SECTION SHALL NOT DEFLECT BY MORE THAN ONE (1) INCHES PER FOOT FROM THE ALIGNMENT PRECEDING OR FOLLOWING THE PULL BOX.
4. LATERAL CONDUIT AS REQUIRED.
5. ALL POWER AND COMMUNICATIONS CABLE SHALL BE TAGGED WITH CABLE IDENTIFICATION.
6. "VISALIA COMMUNICATIONS" SHALL BE THE TITLE EMBOSSED ON THE LID.
7. PVC CONDUIT SHALL BE USED TO ATTACH TO PULL BOX TERMINATORS. SEE TYPICAL FIBER PULL BOX STANDARD DRAWING.
8. 30# FELT PAPER AND A GALVANIZED STEEL SCREEN WITH NO LARGER THAN THREE QUARTERS (3/4) OF AN INCH OPENINGS SHALL BE INSTALLED BETWEEN PULL BOX AND AGGREGATE.
9. INSTALL ORANGE FLEXIBLE IDENTIFICATION MARKERS TWELVE (12) INCHES IN FRONT OF EACH PULL BOX WITHOUT TOUCHING CONDUIT. MARKER HEIGHT SHALL BE THREE (3) FEET ABOVE GRADE AND LABELED "FIBER OPTIC CABLE". FLEXIBLE IDENTIFICATION MARKERS SHALL NOT BE INSTALLED AT PULL BOXES AT SIGNALIZED INTERSECTIONS.
10. POUR 2-SACK SLURRY, OR A CONTROLLED LOW STRENGTH MATERIAL THAT MEETS CALTRANS SPECIFICATIONS, WITHIN TWELVE (12) INCHES OF PULL BOX.
11. PULL BOX HEIGHT ABOVE FINISHED GRADE SHALL PERMIT TWO (2) INCHES OF DECOMPOSED GRANITE TO BE USED TO MATCH SLOPE.
12. REFER TO TYPICAL FIBER PULL BOX STANDARD DRAWING FOR PULL BOX DIMENSIONS.
13. EXISTING PULL BOX CONFIGURATIONS MAY VARY. LOCATIONS WHERE PULL BOXES ARE BEING REPLACED, FIBER PULL BOXES SHALL BE INSTALLED AS SHOWN ON THIS SHEET UNLESS DIRECTED OTHERWISE BY THE CITY ENGINEER OR DESIGNEE.
14. EXISTING CONDUIT ENTERING A PULL BOX MAY NOT BE CORRECTLY ALIGNED TO FACILITATE PULLING CABLES THROUGH THE PULL BOX BY USE OF A PULLING SHOE. THE FORCE ACCOUNT ITEM FOR CONDUIT RECONDITIONING DOES NOT COVER REALIGNMENT OF CONDUIT TO ALLOW FOR PULLING THROUGH AN EXISTING PULL BOX, THEREBY ELIMINATING IT AS A PULL POINT.
15. IN ALL LOCATIONS WHERE FIBER OPTIC CABLE ENTERS A PULL BOX, CABLE SLACK SHALL BE LOOSELY LOOPED USING THE RACK AND HOOK SYSTEM. THIRTY FOOT (30') OF SLACK SHALL BE LEFT WHERE THE FIBER OPTIC CABLE ENTERS/EXITS THE COMMUNICATION VAULT PROVIDING A SIXTY FOOT (60') COIL OF SLACK.
16. A GROUNDING ELECTRODE REQUIRED WHEN SPECIFIED.

INSTRUCTIONS:

IT IS INTENDED THAT THESE NOTES SHALL BE PLACED ON THE PLANS WHERE APPROPRIATE TO FIT SPECIFIC PROJECT CONDITIONS. IF THEY ARE EDITED OR ALTERED, THESE NOTES SHALL REQUIRE APPROVAL BY THE CITY ENGINEER OR DESIGNEE.

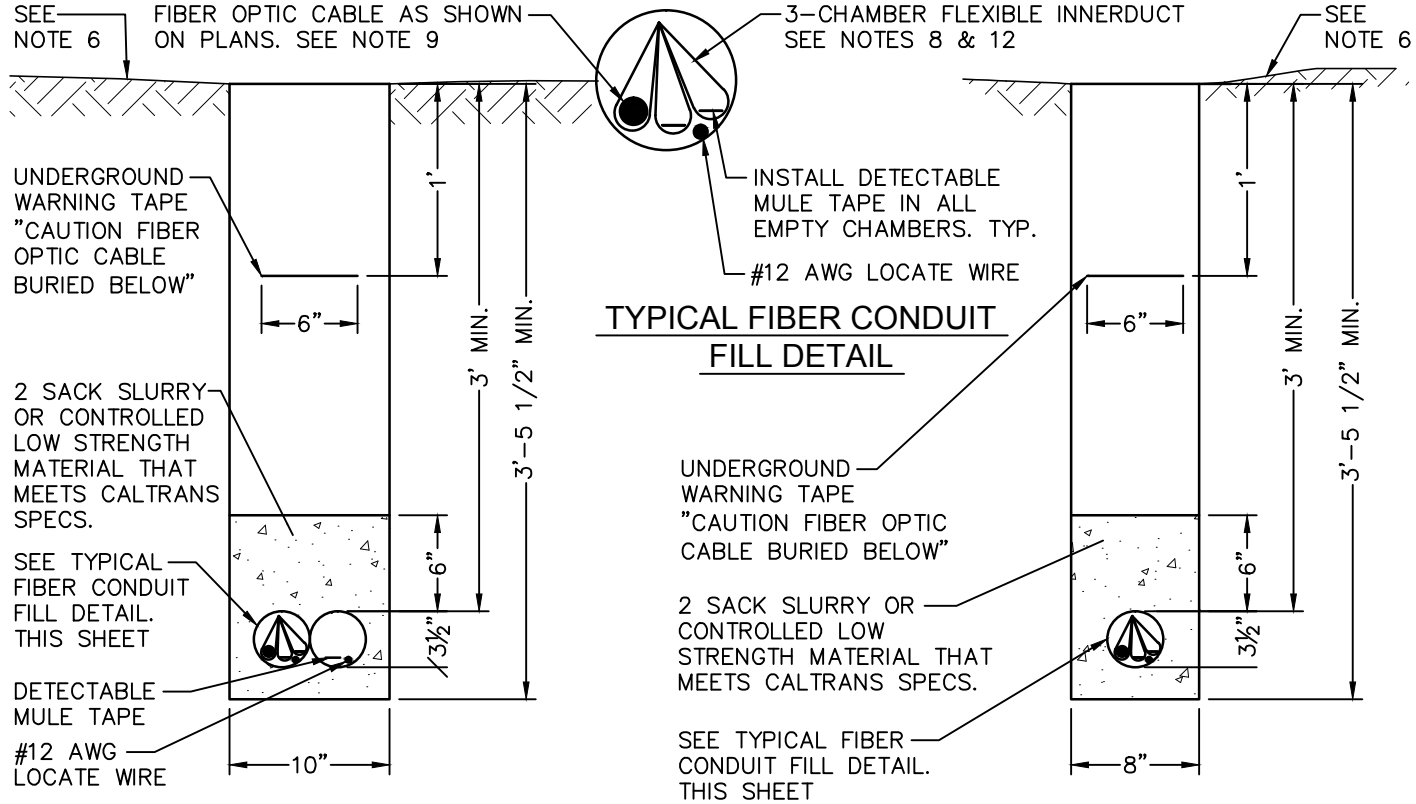
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TYPICAL FIBER PULL BOX INSTALLATION 2 OF 2

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(2) 3" PVC CONDUIT OPEN TRENCH INSTALLATION

(1) 3" PVC CONDUIT OPEN TRENCH INSTALLATION

NOTES:

1. CONDUIT CONTENTS ARE ORIENTED ASSUMING THE SECTION FACING IN THE DIRECTION OF TRAVEL FOR THE MAJOR ARTERIAL.
2. ALL SPOIL MATERIAL SHALL BE REMOVED OFFSITE BY THE CONTRACTOR.
3. AREA SHALL BE RETURNED TO EXISTING GRADE.
4. CONDUIT COUPLINGS SHALL BE STAGGERED.
5. #12 AWG LOCATE WIRE SHALL BE INSTALLED IN ALL CONDUITS. DETECTABLE MULE TAPE SHALL BE INSTALLED IN ALL UNUSED CONDUITS AND FLEXIBLE INNERDUCT CHAMBERS. LEAVE A 10 FOOT LOOP OF WIRE IN A SMALL JUNCTION BOX WITHIN 5 FEET OF THE CONTROLLER CABINET, OR WITHIN THE CABINET.
6. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT TO 95% OF MAXIMUM DENSITY.
7. CONTROLLED LOW STRENGTH MATERIAL REQUIRED WHEN TRUNK AND/OR BRANCH FIBER-OPTIC CABLES INSTALLED IN CONDUIT (2-SACK SLURRY).
8. FLEXIBLE INNERDUCT, MULE TAPE, AND LOCATE WIRE SHALL BE INSTALLED AT TIME OF CONDUIT INSTALLATION AND SHALL TERMINATE AT EACH PULL BOX LOCATED ON PLANS.
9. IF FIBER IS BEING INSTALLED IN EXISTING CONDUIT AND INNERDUCT IS NOT PRESENT, THE 3 CHAMBER FLEXIBLE INNERDUCT SHALL BE INSTALLED PRIOR TO FIBER INSTALLATION.
10. TRENCH UNDER PAVEMENT OR SIDEWALK SHALL REQUIRE MINIMUM ONE-SACK SLURRY (DIRECTED BY CITY ENGINEER OR DESIGNEE) AND BACKFILL PER CITY OF VISALIA EXCAVATION STANDARD DRAWINGS.
11. FIBER INSTALLATION AND TESTING SHALL CONFORM TO THE CITY OF VISALIA STANDARDS AND SPECIFICATIONS.
12. IN CASES WHERE FIBER IS NOT BEING INSTALLED (I.E., CONDUIT ONLY INSTALLATIONS), THE FLEXIBLE INNERDUCT SHALL NOT BE INSTALLED.
13. WHERE CONDUIT IS PLACED IN AN OPEN TRENCH, IT SHALL NOT DEVIATE MORE THAN ONE INCH PER FOOT (1":12" MAX.) IN EITHER THE HORIZONTAL OR VERTICAL PLANES.
14. CONDUIT RUNS SHALL FOLLOW THE MOST DIRECT ROUTE POSSIBLE WITH NO MORE THAN TWO 90° BENDS BETWEEN PULL POINTS AND NO MORE THAN A TOTAL OF 270° OF BEND BETWEEN PULL POINTS.
15. NO MORE THAN ONE WEEK PRIOR TO THE INSTALLATION OF ANY CABLE, ALL NEW AND EXISTING CONDUIT RUNS IN WHICH CABLE IS TO BE INSTALLED SHALL BE CLEARED BY PULLING A METAL-DISC MANDREL OF 90% DIAMETER OF THE CONDUIT.
16. WHEN CONDUIT IS TRENCHED UNDER ROADWAY PAVEMENT, THERE SHALL BE SUFFICIENT VERTICAL CLEARANCE BETWEEN CONDUIT AND PAVEMENT STRUCTURAL SECTION AS DIRECTED BY THE CITY ENGINEER.

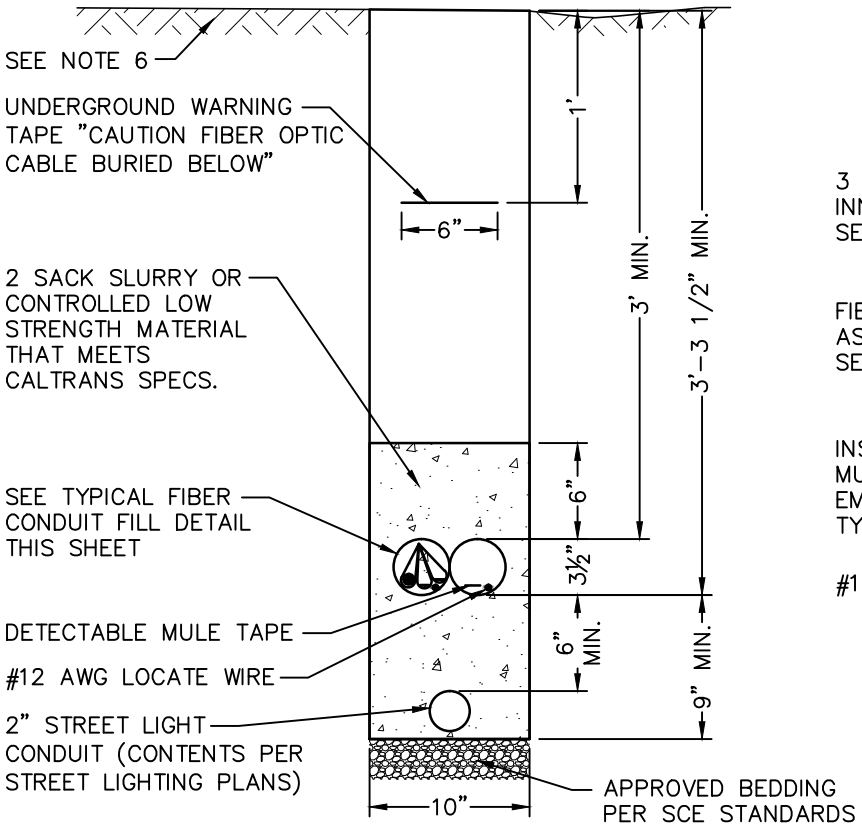
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

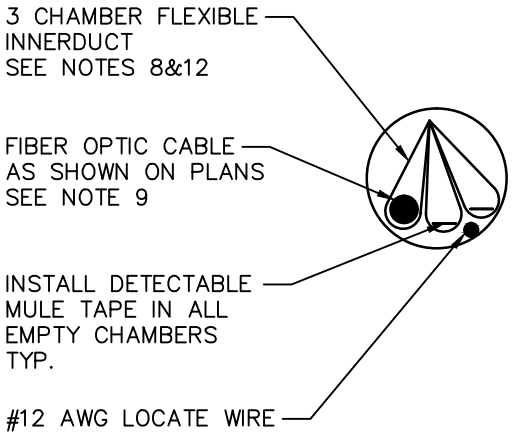
TYPICAL FIBER TRENCH DETAILS

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(2) 3" PVC CONDUIT OPEN TRENCH INSTALLATION



TYPICAL FIBER CONDUIT FILL DETAIL

NOTES:

1. CONDUIT CONTENTS ARE ORIENTED ASSUMING THE SECTION FACING IN THE DIRECTION OF TRAVEL FOR THE MAJOR ARTERIAL.
2. ALL SPOIL MATERIAL SHALL BE REMOVED OFFSITE BY THE CONTRACTOR.
3. AREA SHALL BE RETURNED TO EXISTING GRADE.
4. CONDUIT COUPLINGS SHALL BE STAGGERED.
5. #12 AWG LOCATE WIRE SHALL BE INSTALLED IN ALL CONDUITS. LEAVE A 10 FOOT LOOP OF WIRE IN A SMALL JUNCTION BOX (CHRISTY FIBERLYTE FL9 OR APPROVED EQUAL) WITHIN 5 FEET OF THE CONTROLLER CABINET. DETECTABLE MULE TAPE SHALL BE INSTALLED IN ALL UNUSED CONDUITS AND FLEXIBLE INNERDUCT CHAMBERS.
6. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT TO 95% OF MAXIMUM DENSITY.
7. CONTROLLED LOW STRENGTH MATERIAL REQUIRED WHEN TRUNK AND/OR BRANCH FIBER-OPTIC CABLES INSTALLED IN CONDUIT.
8. FLEXIBLE INNERDUCT, MULE TAPE, AND LOCATE WIRE SHALL BE INSTALLED AT TIME OF CONDUIT INSTALLATION AND SHALL TERMINATE AT EACH PULL BOX LOCATED ON PLANS.
9. IF FIBER IS BEING INSTALLED IN EXISTING CONDUIT AND INNERDUCT IS NOT PRESENT, THE 3 CHAMBER FLEXIBLE INNERDUCT SHALL BE INSTALLED PRIOR TO FIBER INSTALLATION.
10. TRENCH UNDER PAVEMENT OR SIDEWALK SHALL REQUIRE MINIMUM ONE-SACK SLURRY (DIRECTED BY CITY ENGINEER OR DESIGNEE) BACKFILL PER CITY OF VISALIA EXCAVATION STANDARD DRAWINGS.
11. FIBER INSTALLATION AND TESTING SHALL CONFORM TO THE CITY OF VISALIA STANDARDS AND SPECIFICATIONS.
12. IN CASES WHERE FIBER IS NOT BEING INSTALLED (I.E., CONDUIT ONLY INSTALLATIONS), THE FLEXIBLE INNERDUCT SHALL NOT BE INSTALLED.
13. WHERE CONDUIT IS PLACED IN AN OPEN TRENCH, IT SHALL NOT DEVIATE MORE THAN ONE INCH PER FOOT (1":12" MAX.) IN EITHER THE HORIZONTAL OR VERTICAL PLANES.
14. CONDUIT RUNS SHALL FOLLOW THE MOST DIRECT ROUTE POSSIBLE WITH NO MORE THAN TWO 90° BENDS BETWEEN PULL POINTS AND NO MORE THAN A TOTAL OF 270° OF BEND BETWEEN PULL POINTS.
15. NO MORE THAN ONE WEEK PRIOR TO THE INSTALLATION OF ANY CABLE, ALL NEW AND EXISTING CONDUIT RUNS IN WHICH CABLE IS TO BE INSTALLED SHALL BE CLEARED BY PULLING A METAL-DISC MANDREL OF 90% DIAMETER OF THE CONDUIT.

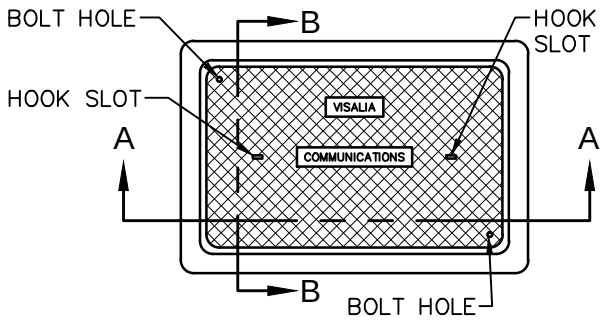
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

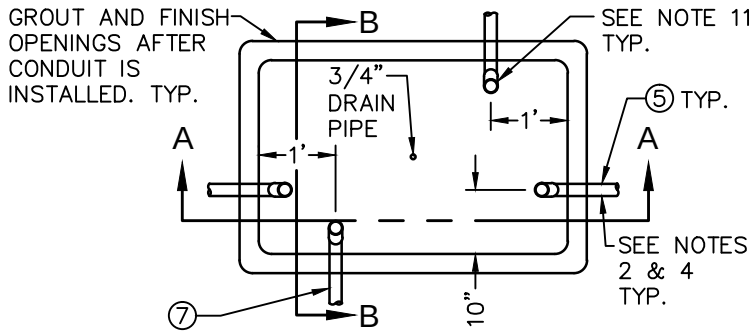
TYPICAL FIBER AND STREET LIGHTING JOINT TRENCH DETAIL

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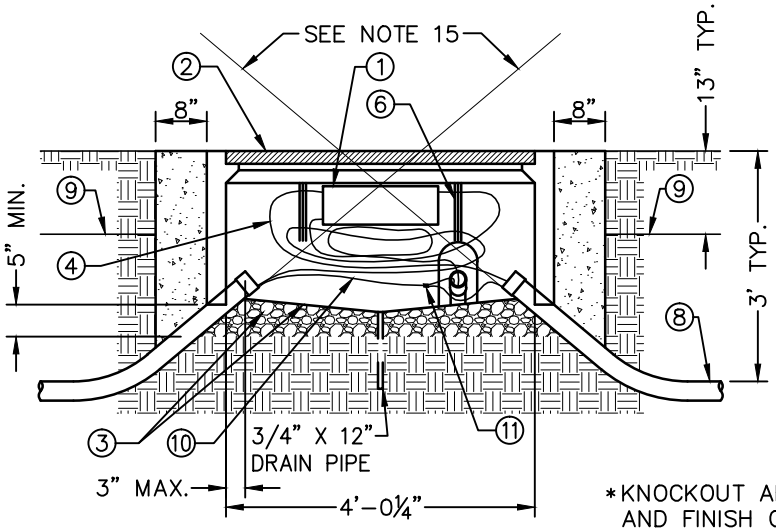
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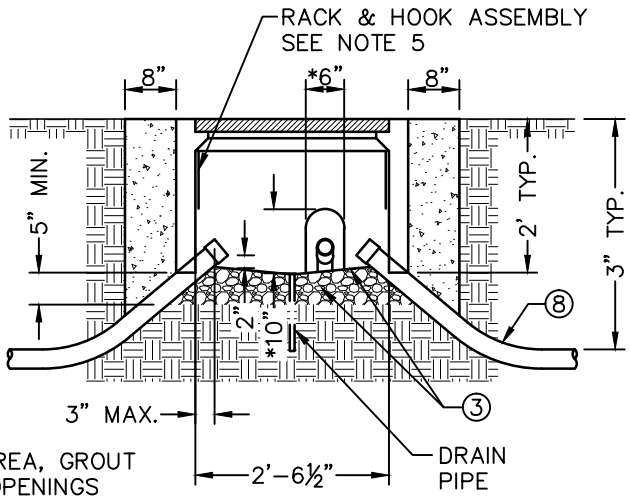
PLAN



PLAN-NO LID



SECTION A-A



SECTION B-B

*KNOCKOUT AREA, GROUT AND FINISH OPENINGS AFTER CONDUIT IS INSTALLED

NOTE: STRICTER REQUIREMENTS AS DIRECTED BY THE CITY ENGINEER IF PULL BOX IS WITHIN ROADWAY.

LEGEND:

① FIBER OPTIC CABLE SPLICE CLOSURE.

② FIBER OPTIC SPLICE VAULT LID.

③ 1.5 INCH MAXIMUM COARSE AGGREGATE WITH 2 INCHES GROUT COVER OVER THE AGGREGATE. THE GROUT COVER SHALL BE SLOPED TOWARD THE DRAIN FOR DRAINAGE.

④ FIBER OPTIC CABLE. COIL AS REQUIRED.

⑤ PROPOSED SMFO BRANCH OR TRUNKLINE CONDUIT, IF NEEDED SEE PLANS

⑥ RACK & HOOK ASSEMBLY. SEE NOTE 5 ON TYPICAL COMMUNICATIONS VAULT INSTALLATION NOTES STANDARD DRAWING

⑦ TRAFFIC SIGNAL CONDUIT TYP. IF NEEDED. SEE PLANS.

⑧ 45 DEGREE ELBOW, 36" RADIUS MIN. ELBOW AND COUPLING MAY NOT BE NECESSARY FOR NEW CONDUIT INSTALLED BY DIRECTIONAL BORING. NEW CONDUIT INSTALLED BY DIRECTIONAL DRILLING SHALL ENTER SPLICE VAULT WITH BENDING RADIUS OF 36" MIN. SEE NOTE 15.

⑨ WARNING TAPE. FOR NEW CONDUIT INSTALLED BY TRENCHING

⑩ COIL 3 FEET OF TRACER WIRE.

⑪ SPLICE TRACER WIRE PER CALTRANS STANDARD SPECIFICATIONS FOR CONDUCTOR SPLICING.

APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TYPICAL COMMUNICATIONS VAULT INSTALLATION 1 OF 2

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TYPICAL COMMUNICATIONS VAULT INSTALLATION NOTES:

1. TRUNKLINE CONDUIT(S) FROM THE TYPICAL BORE OR TRENCH SECTION SHOULD NOT DEFLECT BY MORE THAN ONE FOOT PER 10 FEET FROM THE ALIGNMENT PRECEDING OR FOLLOWING PULL BOX/SPLICE VAULT ENTRANCE/EXIT.
2. EXCESS CONDUIT FOR ALL CONDUIT ENDS SHALL BE CUT BACK TO PROVIDE STUB ENDS OF 1" MINIMUM TO 2" MAXIMUM.
3. SEE PLAN SHEETS FOR NUMBER AND SIZE OF CONDUIT.
4. IF MORE THAN 3 CONDUITS ARE REQUIRED IN SAME KNOCKOUT, KNOCKOUT SHALL BE WIDENED TO 1/2" MORE THAN THE COMBINED CONDUIT WIDTH.
5. ALL SPLICE VAULTS SHALL BE FURNISHED WITH TWO RACKS AND HOOKS INSTALLED ON EACH OF THE TWO LONG SIDES.
6. TRUNKLINE CONDUITS SHALL ENTER THROUGH KNOCKOUTS.
7. SPLICE VAULTS, VAULT EXTENSION, AND VAULT LIDS SHALL BE CHRISTY N48 UTILITY BOX OR APPROVED EQUIVALENT, AND SUPPORT MINIMUM TEST LOAD OF 12,500 LBS. IF SPLICE VAULT IS LOCATED IN TRAVEL WAY, SPLICE VAULT AND LID SHALL CONFORM VERTICAL PROOF LOAD STRENGTH REQUIREMENT AS PER CALTRANS STANDARD SPECIFICATIONS, SECTION 86-2.07.
8. LOCKING MECHANISM SHALL BE PROVIDED FOR VAULT LID. TWO 3/8" PENTA HEAD BOLTS AT 90° SHALL BE USED, ONE 3/8" PENTA HEAD SOCKET AND RATCHET SHALL BE PROVIDED TO CITY OF VISALIA FOR EVERY 10 SPLICE VAULTS.
9. "VISALIA COMMUNICATIONS" SHALL BE CASTED ON THE TOP FACE OF ALL VAULT LIDS.
10. CUT CONDUIT, DE-BURR, AND RE-THREAD PRIOR TO INSTALLING FIBER OPTIC CABLE AND/OR OTHER CABLES/CONDUCTORS. ALL METALLIC CONDUITS SHALL HAVE THREADED METALLIC BUSHINGS. ALL PVC AND HDPE CONDUITS SHALL HAVE BELL ENDS.
11. FURNISH AND INSTALL CAPS OR DUCT PLUGS FOR ALL UNUSED CONDUIT.
12. SPLICE CLOSURE SHALL BE ATTACHED TO THE RACK AND HOOK SYSTEM ON THE SAME SIDE AS THE FIBER OPTIC CABLE. THE SPLICE CLOSURE SHALL BE ANGLED TO FACILITATE MINIMUM BENDING RADIUS IN THE CABLE.
13. IF APPLICABLE, SPLICE VAULT HEIGHT ABOVE EXISTING DIRT GRADE SHALL PERMIT 1" OF FUTURE SURFACE LANDSCAPING. WHEN SPLICE VAULT IS INSTALLED IN EXISTING SIDEWALK, SPLICE VAULT LID SHALL SIT FLUSH WITH THE SIDEWALK. COORDINATE WITH ENGINEER WHERE THIS APPLIES.
14. EACH FIBER OPTIC SPLICE VAULT SHALL BE EQUIPPED WITH 50' MIN. OF SLACK IN THE TRUNKLINE CABLE AND 25' MIN. OF SLACK IN THE BRANCH CABLE ON EACH SIDE OF FIBER OPTIC SPLICE CLOSURE. (I.E. THE TRUNKLINE CABLE TYPICALLY WILL HAVE 50' OF SLACK AND THE BRANCH CABLE WILL TYPICALLY HAVE 25' OF SLACK.)
15. BOTTOM OF CONDUIT CENTERLINE SHALL BE ALIGNED TO EXIT TOP OF SPLICE VAULT TO FACILITATE CABLE PULLING.
16. MINIMUM SPLICE VAULT DEPTH SHALL BE 2'. IF NECESSARY, AN EXTENSION MAY BE USED TO MEET THIS REQUIREMENT.

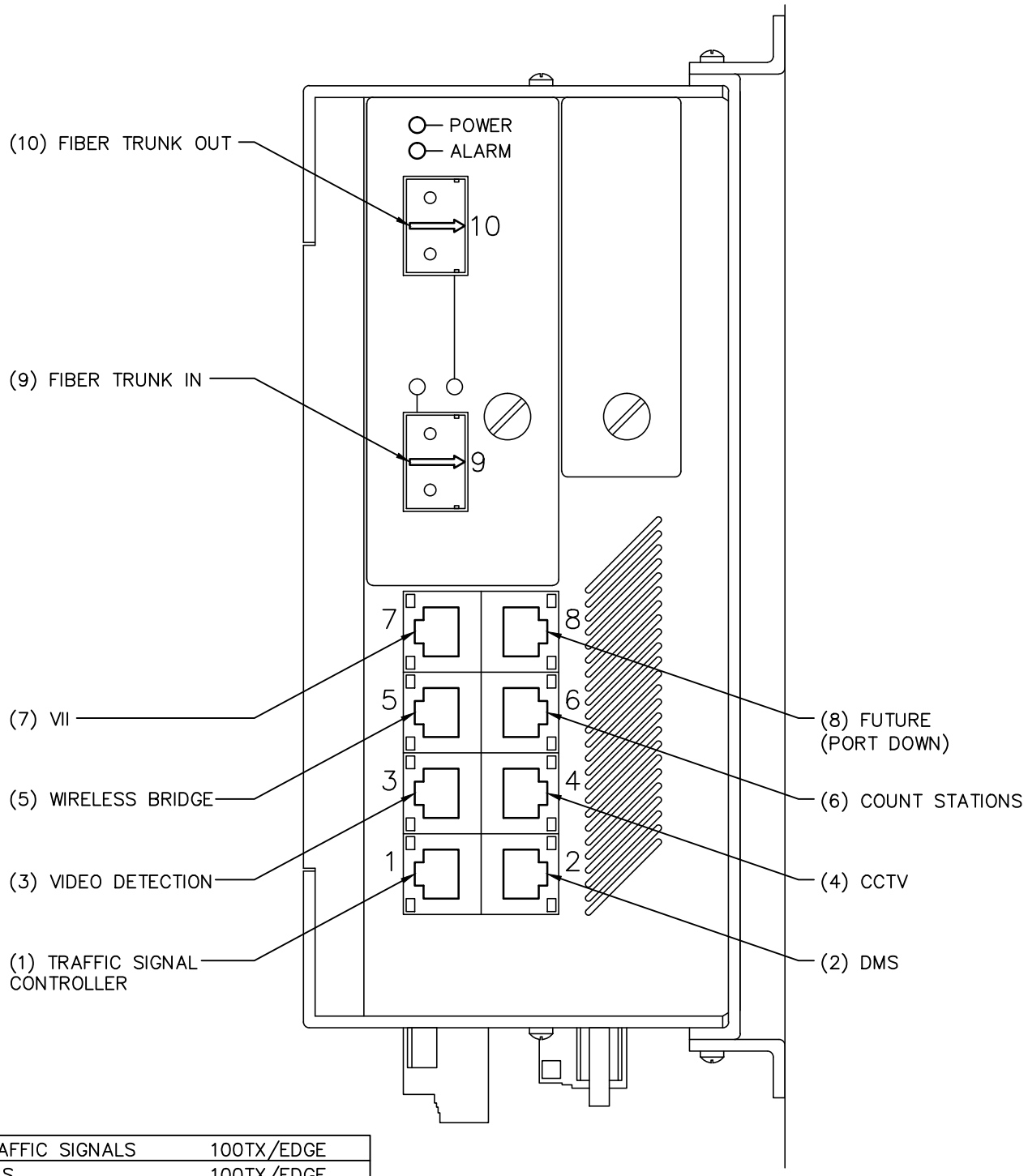
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

TYPICAL COMMUNICATIONS VAULT INSTALLATION 2 OF 2

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PORT 1 TRAFFIC SIGNALS	100TX/EDGE
PORT 2 DMS	100TX/EDGE
PORT 3 VIDEO DETECTION	100TX/EDGE
PORT 4 CCTV	100TX/EDGE
PORT 5 WIRELESS	100TX/TRUNK
PORT 6 COUNT STATIONS	100TX/EDGE
PORT 7 VII (FUTURE)	100TX/EDGE
PORT 8 SPARE	100TX/OFF
PORT 9 FIBER IN	1000FX/TRUNK
PORT 10 FIBER OUT	1000FX/TRUNK

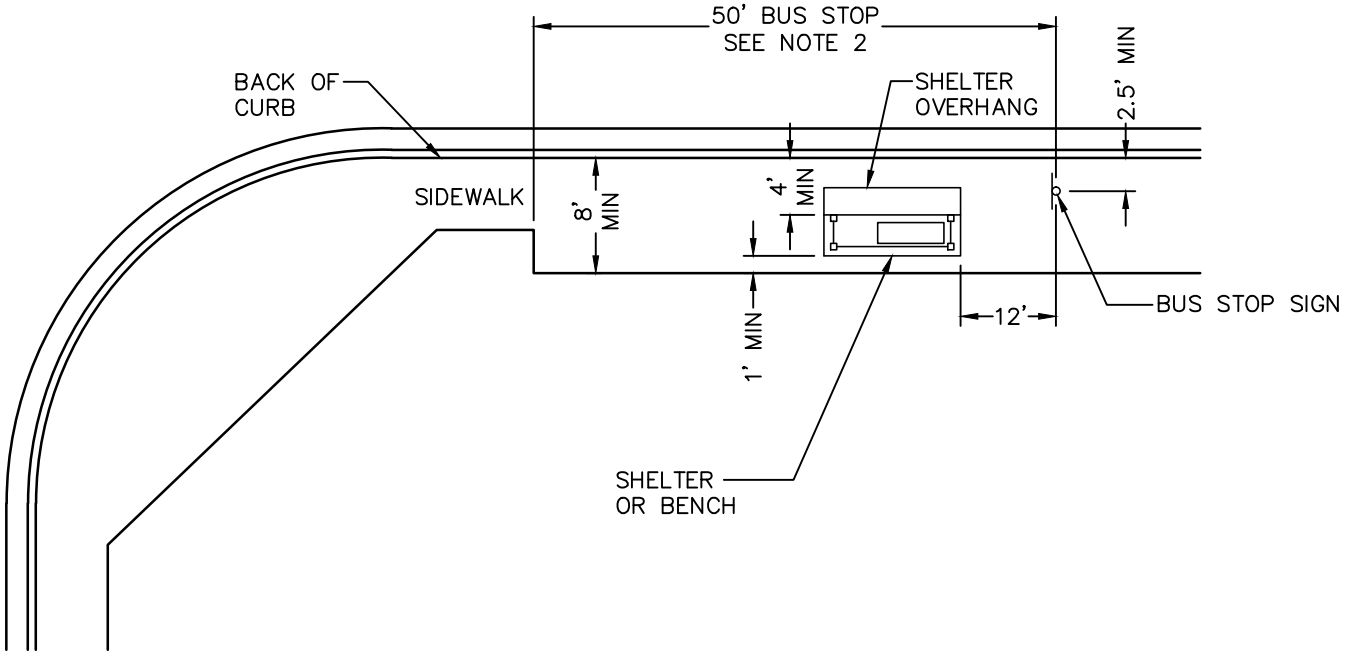
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CITY ENGINEER R.P.E. 81734 DATE

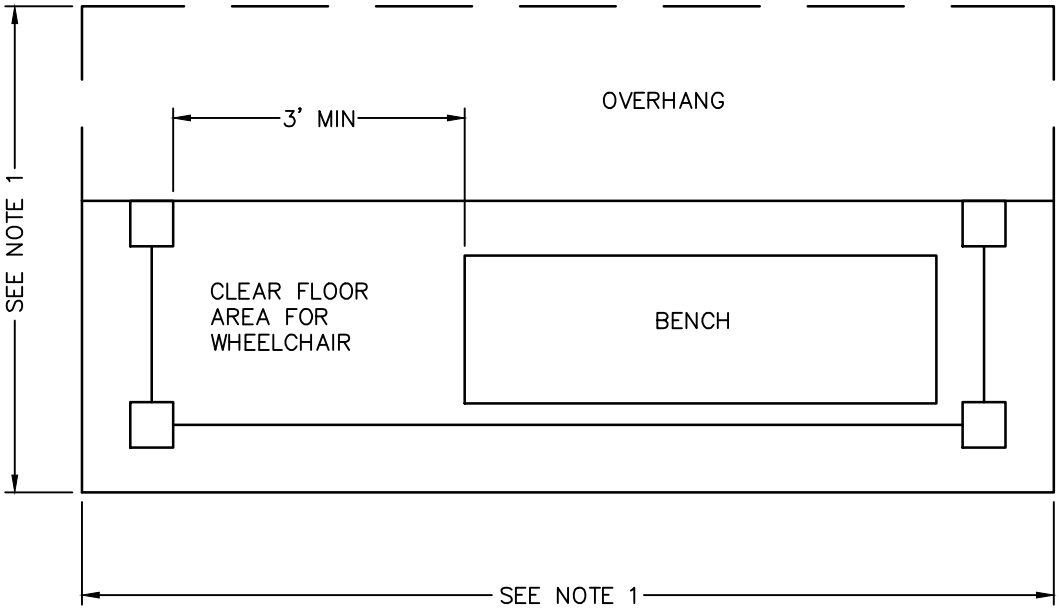
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

ITS FIELD SWITCH STATIC PORT ASSIGNMENTS

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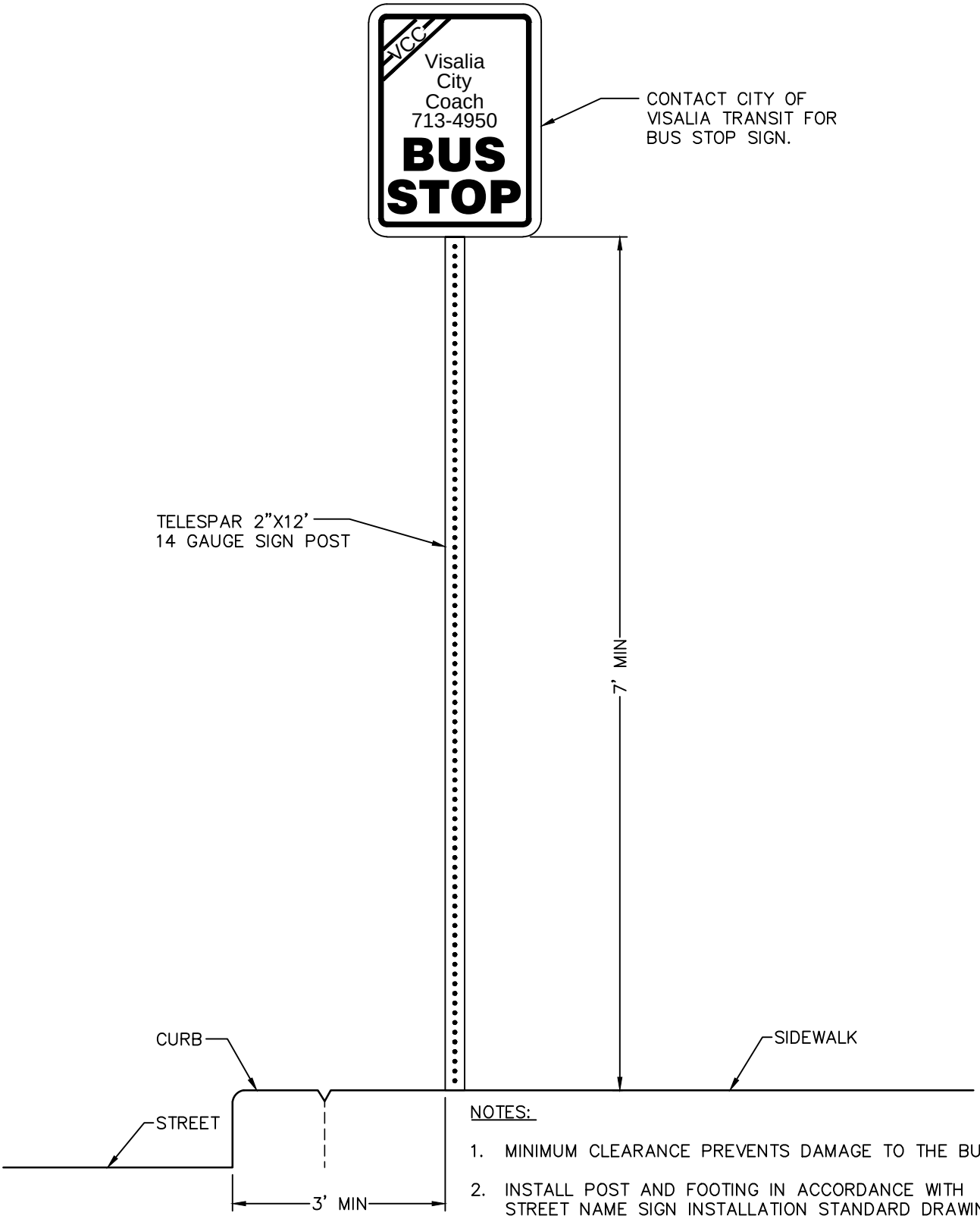


NOTES:

1. ALL SHELTERS SHALL BE PROPERLY CONSTRUCTED ACCORDING TO THE CITY'S ENGINEERED PLANS. CONTACT THE TRANSIT DEPARTMENT TO OBTAIN THE STRUCTURAL ENGINEERING PLANS FOR THE SHELTER. SIZE OF SHELTER SHALL BE VERIFIED WITH THE TRANSIT DEPARTMENT PRIOR TO CONSTRUCTION.

2. 8' MIN SIDEWALK DEPTH MUST EXTEND AT LEAST 25' ENDING AT BUS STOP SIGN POLE. DESIRABLE LENGTH IS 50'.

APPROVED BY: CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS	
BUS SHELTER AND SIGN LOCATION WITH WHEELCHAIR AREA	REVISIONS 09/27/13 BK 2016	TR–1



NOTES:

1. MINIMUM CLEARANCE PREVENTS DAMAGE TO THE BUS.
2. INSTALL POST AND FOOTING IN ACCORDANCE WITH STREET NAME SIGN INSTALLATION STANDARD DRAWING.

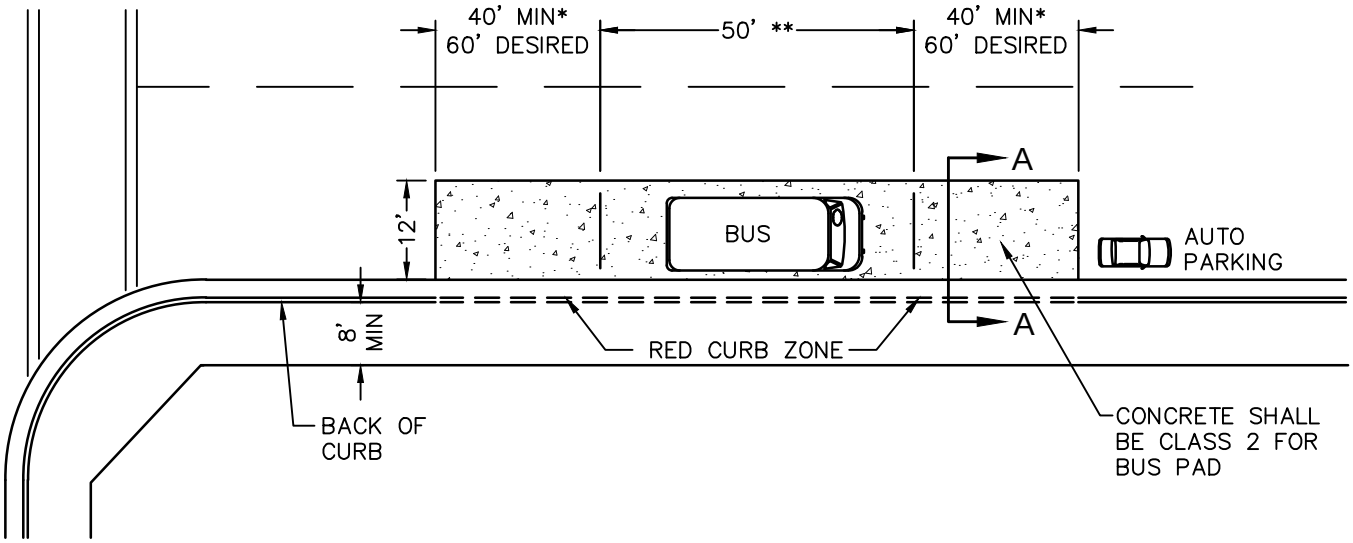
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CITY ENGINEER R.P.E. 81734 DATE

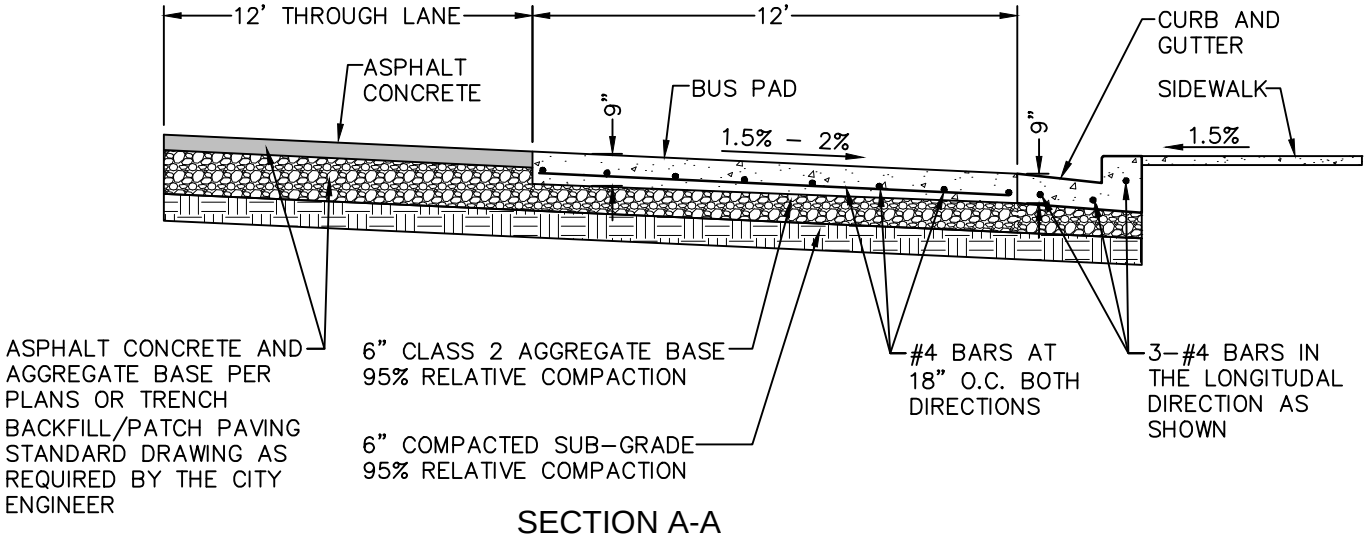
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

BUS STOP SIGN

REVISIONS
09/15/16
BK 2016

TR–2





SECTION A-A

NOTES:

1. CONCRETE FOR BUS PAD SHALL BE CLASS 2.
2. CONCRETE FOR SIDEWALK AND CURB AND GUTTER SHALL BE CLASS 2 OR CLASS 3.
3. REINFORCING BARS SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REINFORCING BARS SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
4. REINFORCING BARS SHALL HAVE A MINIMUM OF 3" OF CLEAR COVERAGE.
5. WEAKEND PLANE JOINTS SHALL BE PLACED IN THE BUS PAD AT 10'–15' CENTERS, MINIMUM DEPTH OF 2". JOINTS IN CURB AND GUTTER SHALL ALIGN WITH JOINTS IN BUS PAD WHERE POSSIBLE.

* 40' MINIMUM FOR SPEED LIMIT 30 MPH AND UNDER. 60' DESIRABLE FOR SPEED LIMIT ABOVE 30 MPH.

** FOR EACH ADDITIONAL PASS THROUGH BUS BERTH ADD 50', AND FOR EACH ADDITIONAL LAYOVER BUS BERTH ADD 80'.

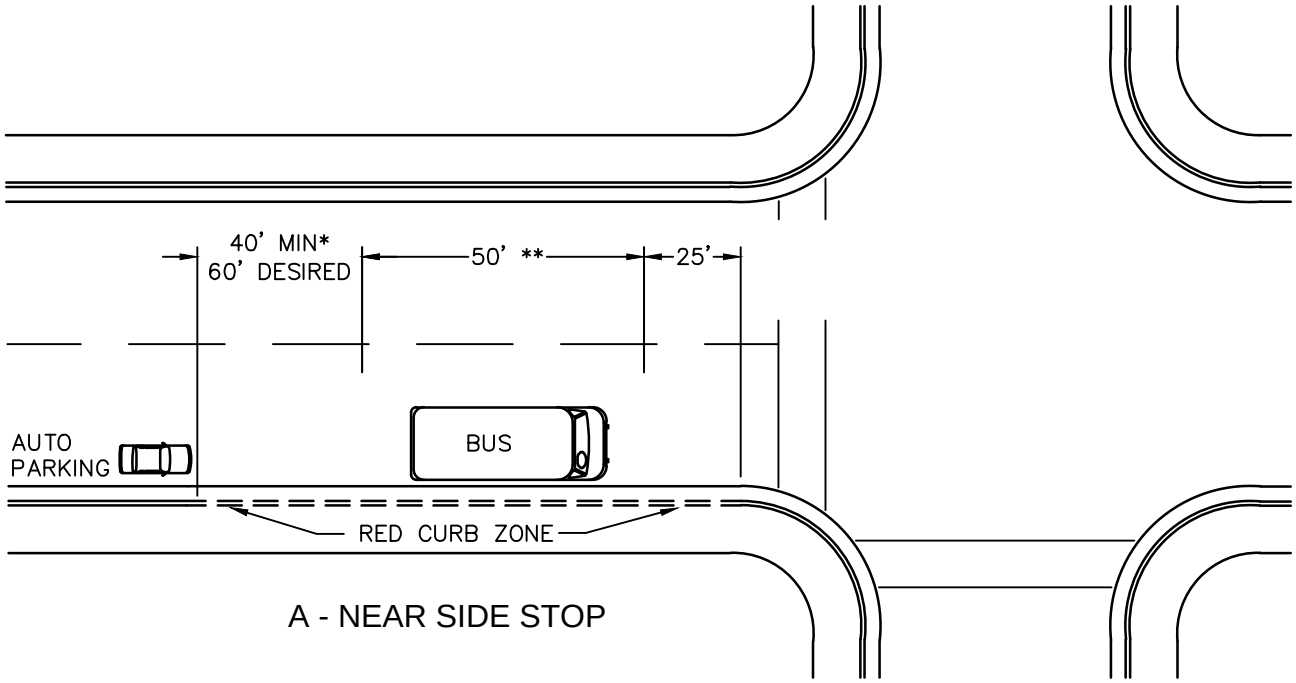
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

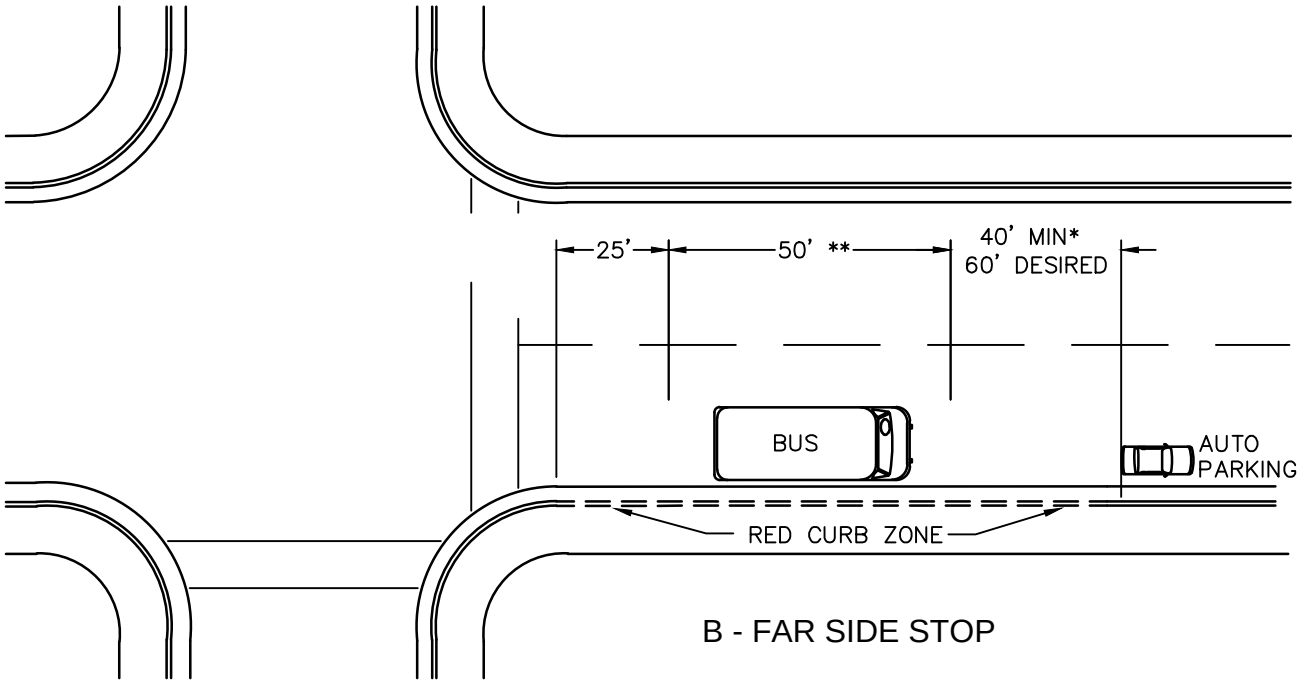
BUS PAD

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TR–3



A - NEAR SIDE STOP



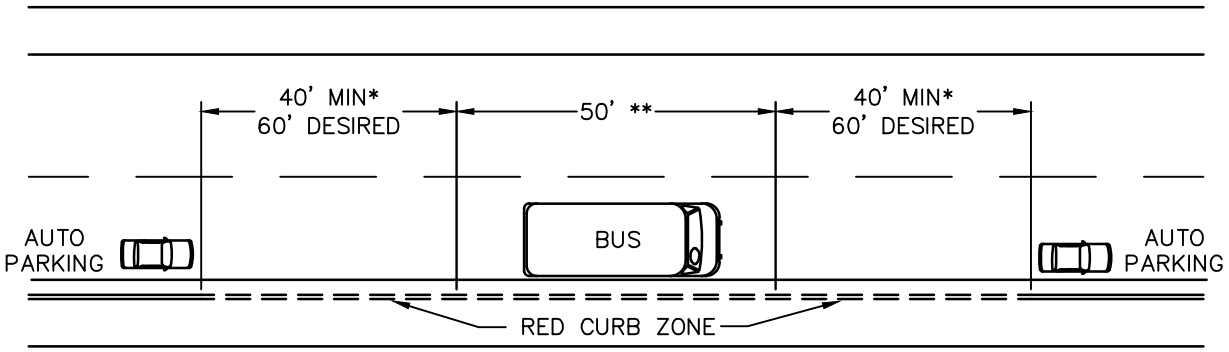
B - FAR SIDE STOP

NOTES:

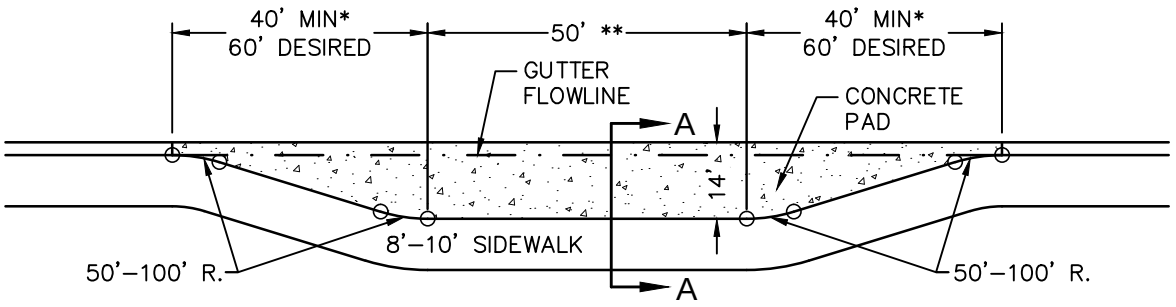
* 40' MINIMUM FOR SPEED LIMIT 30 MPH AND UNDER. 60' DESIRABLE FOR SPEED LIMIT ABOVE 30 MPH.

** FOR EACH ADDITIONAL PASS THROUGH BUS BERTH ADD 50', AND FOR EACH ADDITIONAL LAYOVER BUS BERTH ADD 80'.

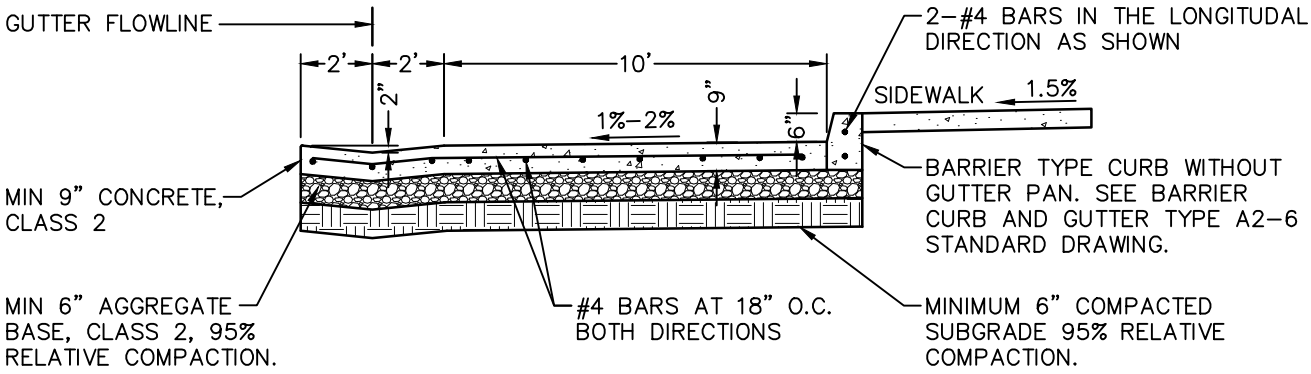
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
BUS STOPS A & B	REVISIONS 09/27/13 BK 2016 TR–4



C - MID-BLOCK STOP



D - TURNOUT STOP



SECTION A-A

NOTES:

1. CONCRETE FOR VEE GUTTER AND BUS PAD SHALL BE CLASS 2.
2. CONCRETE FOR SIDEWALK AND CURB AND GUTTER SHALL BE CLASS 2 OR CLASS 3.
3. REINFORCING BARS SHALL BE DEFORMED STEEL BARS AND SHALL BE GRADE 40 MINIMUM. REINFORCING BARS SHALL BE FREE OF RUST OR DIRT AND SHALL BE THOROUGHLY CLEANED BEFORE PLACEMENT.
4. REINFORCING BARS SHALL HAVE A MINIMUM OF 3" OF CLEAR COVERAGE.
5. WEAKEND PLANE JOINTS SHALL BE PLACED IN THE BUS PAD AT 12'–15' CENTERS, MINIMUM DEPTH OF 2". JOINTS IN CURB AND GUTTER SHALL ALIGN WITH JOINTS IN BUS PAD WHERE POSSIBLE.

* 40' MINIMUM FOR SPEED LIMIT 30 MPH AND UNDER. 60' DESIRABLE FOR SPEED LIMIT ABOVE 30 MPH.

** FOR EACH ADDITIONAL PASS THROUGH BUS BERTH ADD 50', AND FOR EACH ADDITIONAL LAYOVER BUS BERTH ADD 80'.

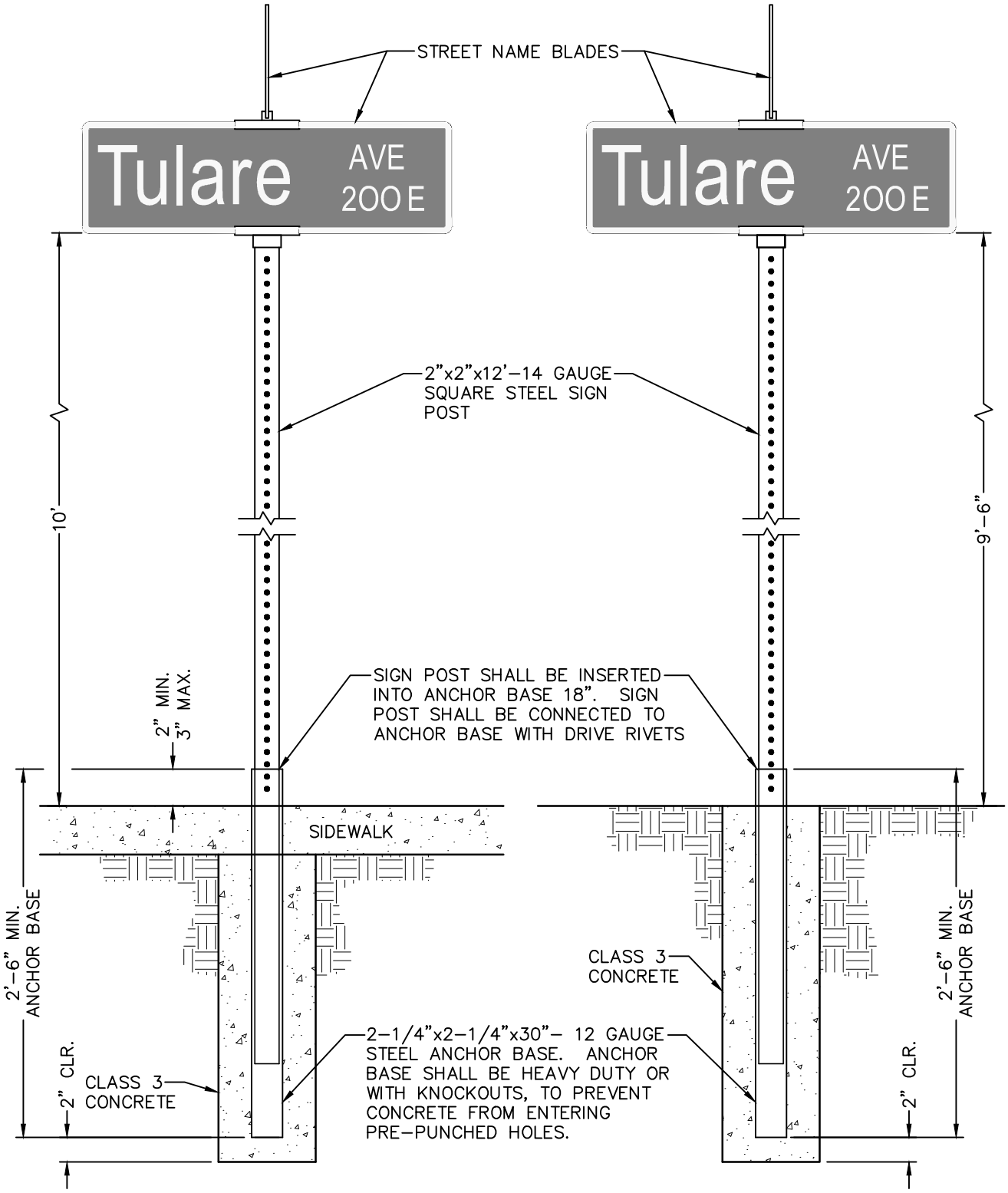
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

BUS STOPS C & D

REVISIONS
09/27/13
BK 2016

TR–5



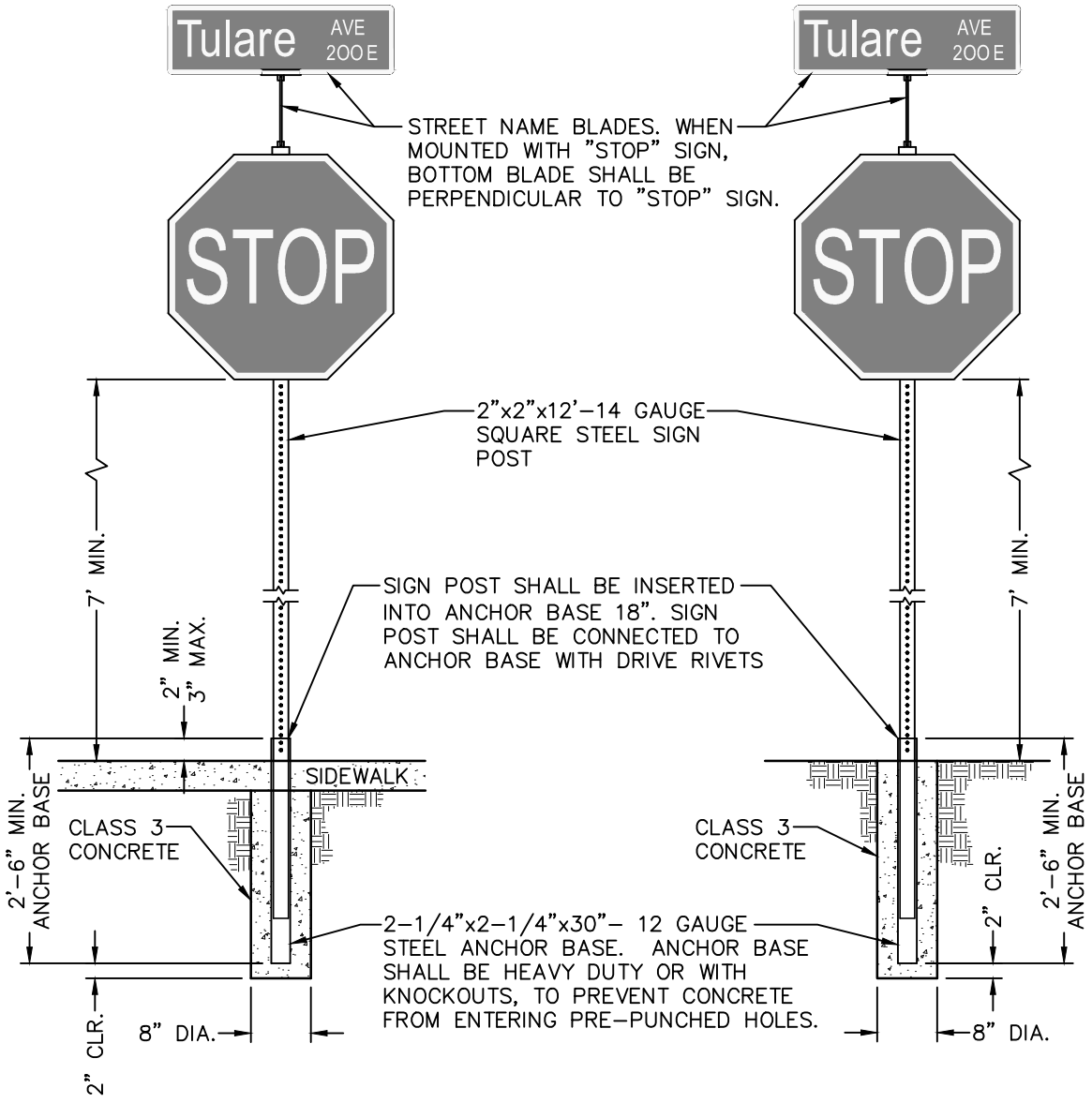
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

STREET NAME SIGN INSTALLATION

REVISIONS
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BK 2016

TS-1



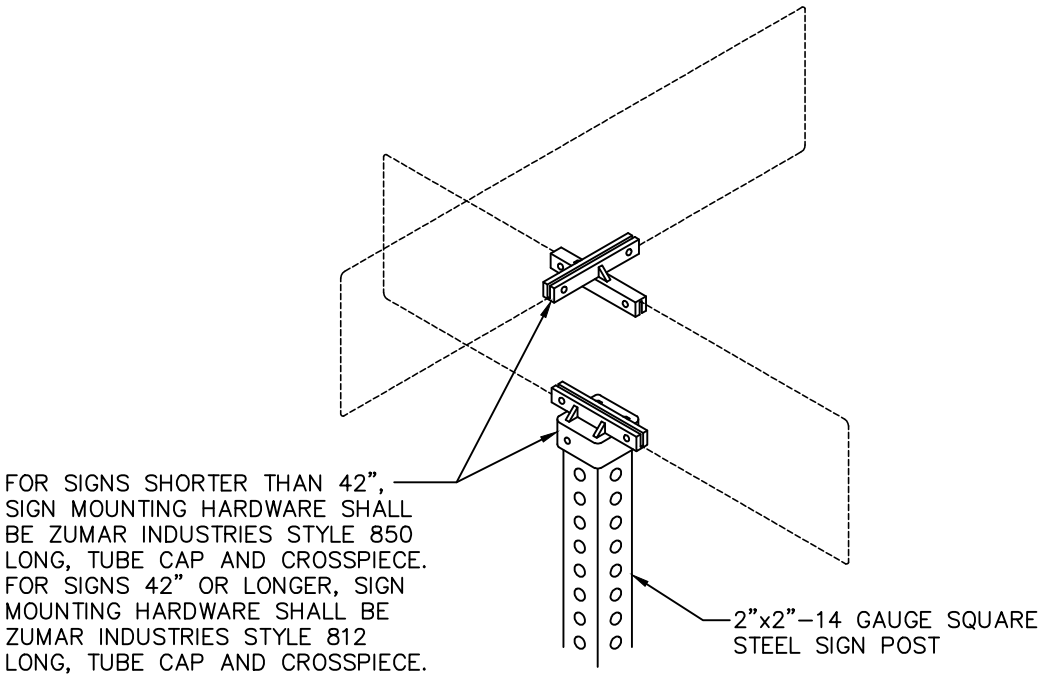
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

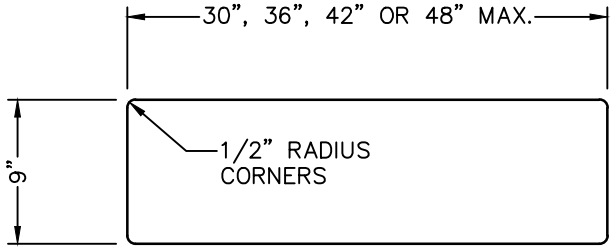
CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

STREET NAME SIGN INSTALLATION WITH "STOP" (R1) SIGN

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BK 2016

TS-2



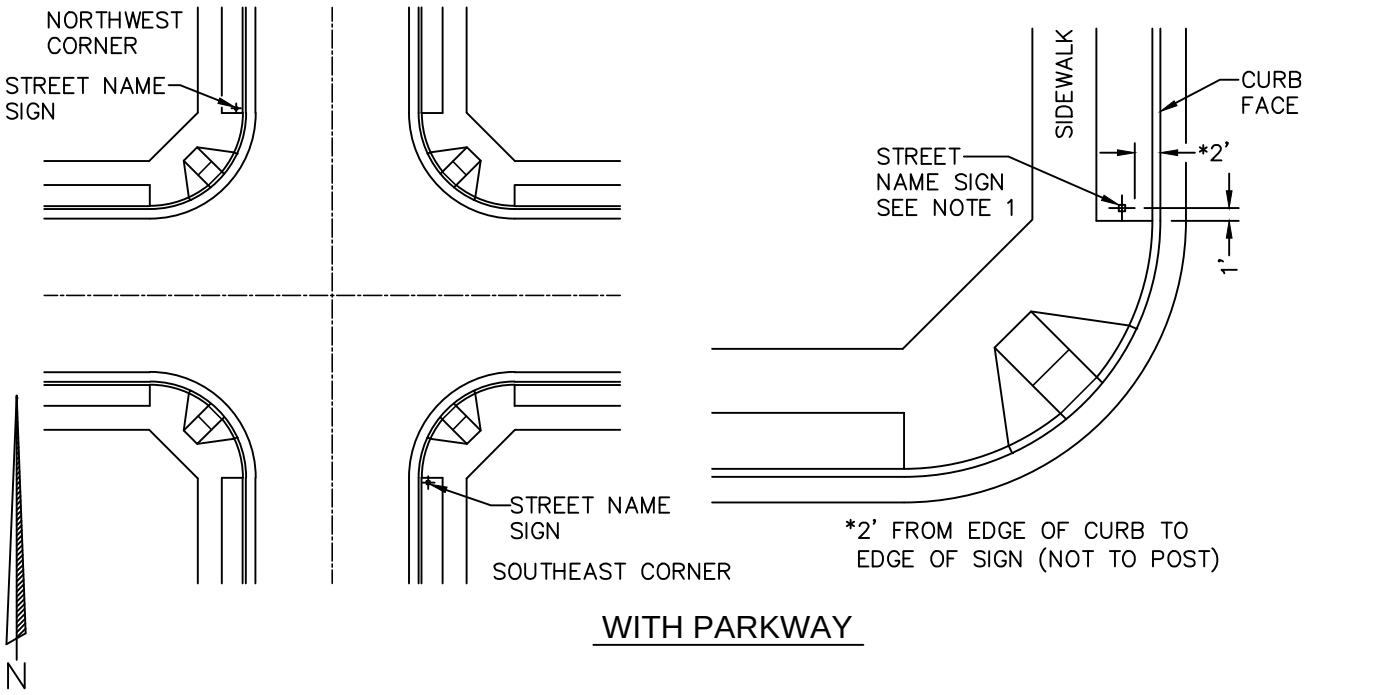


SIGN DIMENSIONS

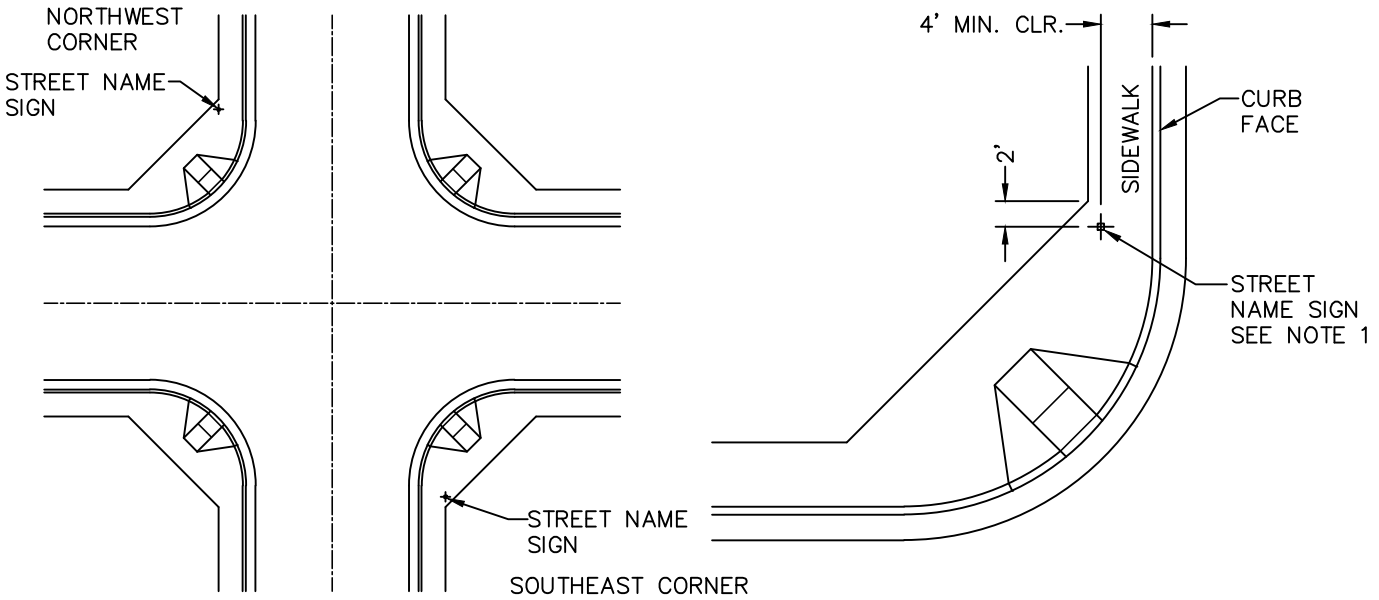
NOTE:

ALL SIGN MATERIAL SHALL CONFORM TO THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS. SIGN BLANKS SHALL BE 0.08" IN THICKNESS AND SHALL BE ALUMINUM ALLOY #5052–H38.

APPROVED BY: CITY ENGINEER R.P.E. 81734 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
STREET NAME SIGNS TYPE 1	REVISIONS 09/13/16 BK 2016
	TS–3



WITH PARKWAY



WITHOUT PARKWAY

NOTES:

1. STREET NAME SIGNS SHALL BE TYPICALLY LOCATED ON THE NORTHWEST OR SOUTHEAST CORNER OF AN INTERSECTION UNLESS PLACED ON A STOP SIGN PER STREET NAME SIGN INSTALLATION WITH "STOP" (R1) SIGN.
2. STREET NAME SIGNS SHALL BE PLACED ON STOP SIGNS AND ATTACHED TO STREET LIGHTS WHENEVER POSSIBLE.
3. STREET NAME SIGNS LOCATED IN SIDEWALK AREAS SHALL MAINTAIN A FOUR FOOT HORIZONTAL CLEAR PEDESTRIAN ACCESS ROUTE.
4. IF NO CURB IS PRESENT, SIGNS ARE TO BE INSTALLED A MINIMUM OF 6FT–12FT FROM EDGE OF PAVEMENT AND/OR AS REQUIRED PER THE CA MUTCD.

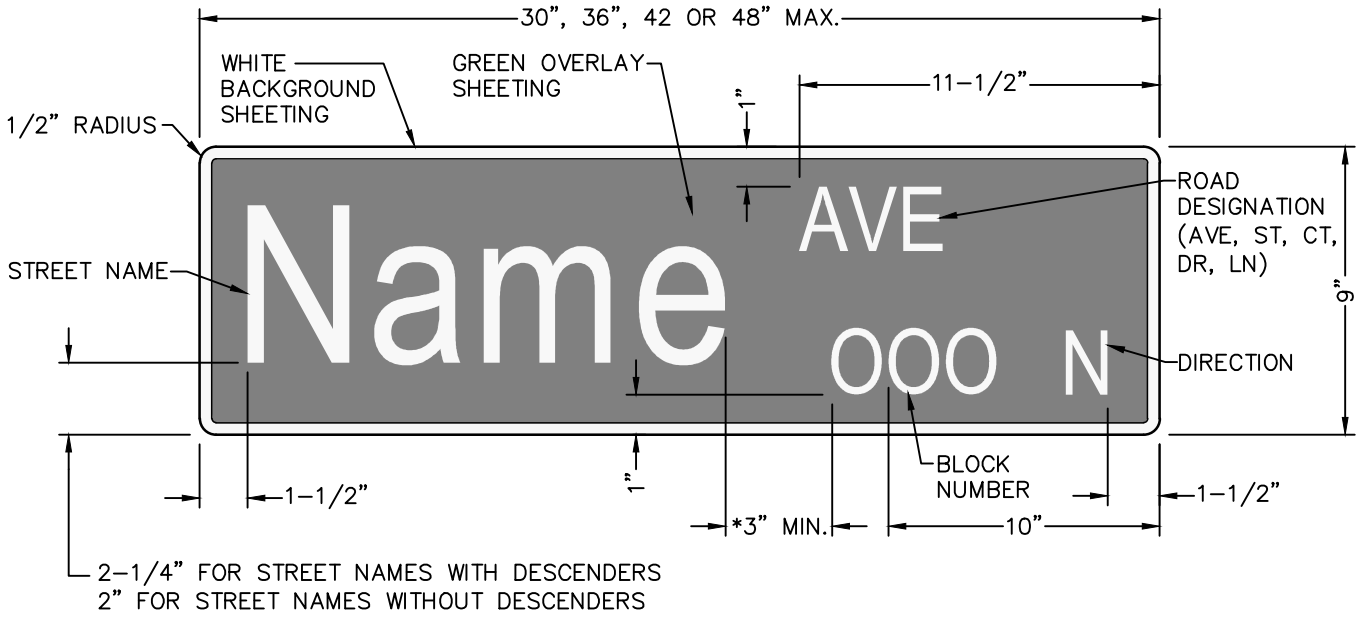
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CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

STREET NAME SIGN LOCATIONS LOCAL STREETS

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BK 2016

TS–4

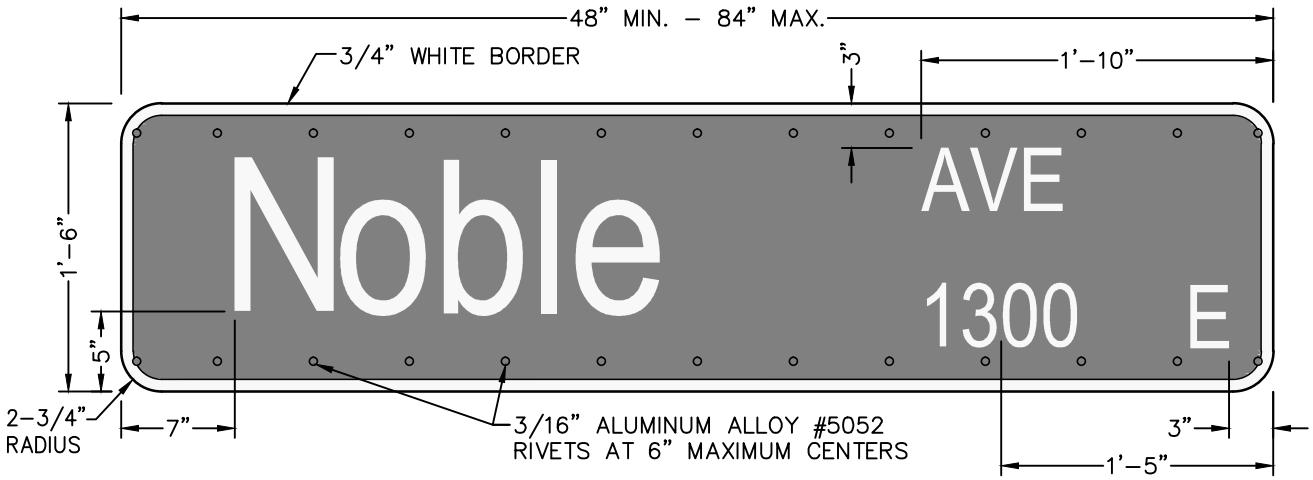


*MINIMUM WIDTH MAY BE REDUCED TO 1" ONLY ON 48" BLADES TO FIT STREET NAME

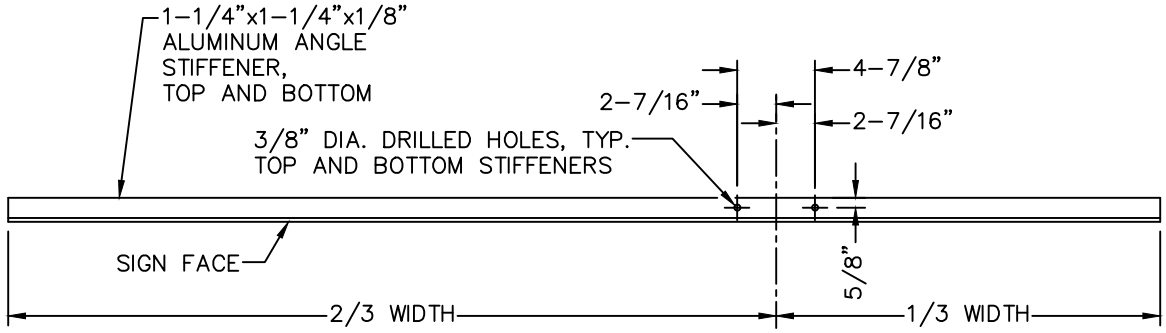
NOTES:

1. ALL SIGN MATERIAL SHALL CONFORM TO THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS. SIGN BLANKS SHALL BE 0.08" MINIMUM IN THICKNESS AND SHALL BE ALUMINUM ALLOY #5052-H38.
2. ALL SHEETING SHALL BE 3M BRAND SCOTCHLITE REFLECTIVE MATERIAL. NO SUBSTITUTIONS WILL BE ACCEPTED.
3. BACKGROUND SHEETING SHALL BE WHITE #4090 (DIAMOND GRADE). OVERLAY SHEETING SHALL BE GREEN #1177C ELECTRONIC CUTTABLE FILM.
4. STREET NAME LETTERS SHALL BE 6" IN SIZE, "ROAD GEEK" OR "HIGHWAY GOTHIC" FONT, SERIES 'C' WITH AN UPPER CASE INITIAL FOLLOWED BY LOWER CASE LETTERS.
5. ROAD DESIGNATION, BLOCK NUMBER AND DIRECTION LETTERS SHALL BE 3" UPPER CASE, SERIES 'C' (DIECUT).
6. WHEN STREET NAME LENGTH DOES NOT FIT ON 48" BLADE, LETTERS MAY BE REDUCED TO SERIES 'B'. SERIES 'A' IN NOT ALLOWED.
7. WHEN STREET NAME LENGTH IS SHORT, USE SERIES 'D'.

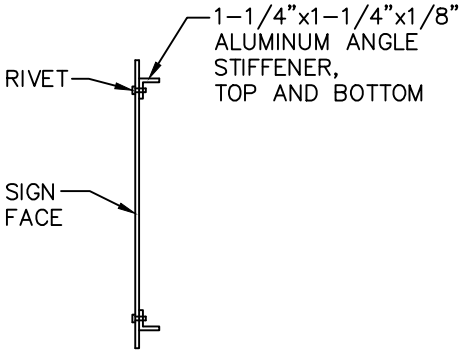
APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
STREET NAME SIGN STREET INTERSECTIONS	REVISIONS 04/29/16 BK 2016 — TS-5



FRONT VIEW



TOP VIEW



SIDE VIEW

NOTES:

1. SIGN BLANK SHALL BE ALUMINUM ALLOY 6061–T6 OR 5052–H38.
2. ALL SHEETING, LETTERS AND NUMERALS SHALL BE 3M BRAND DIAMOND GRADE 3 (DG3) SCOTCHLITE REFLECTIVE MATERIAL. NO SUBSTITUTIONS WILL BE ACCEPTED.
3. BACKGROUND SHEETING SHALL BE GREEN (#4097).
4. BORDER, LETTERS AND NUMERALS SHALL BE WHITE (#3970).
5. STREET NAME LETTERS SHALL BE 12", "HIGHWAY GOTHIC" FONT, SERIES 'E' MODIFIED UPPER CASE INITIAL WITH LOWER CASE SUBSEQUENT LETTERS. "AVE", "ST", "DR", "LN", BLOCK NUMBER AND DIRECTION SHALL BE 5", "HIGHWAY GOTHIC" FONT, SERIES 'E' MODIFIED UPPER CASE LETTERS.
6. SEE STREET NAME SIGN BRACKET STANDARD DRAWING FOR BRACKET INFORMATION.

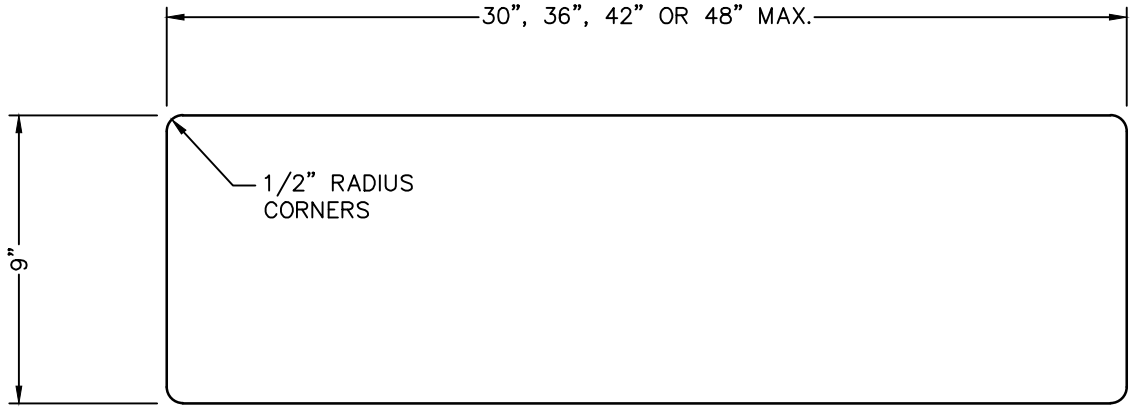
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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

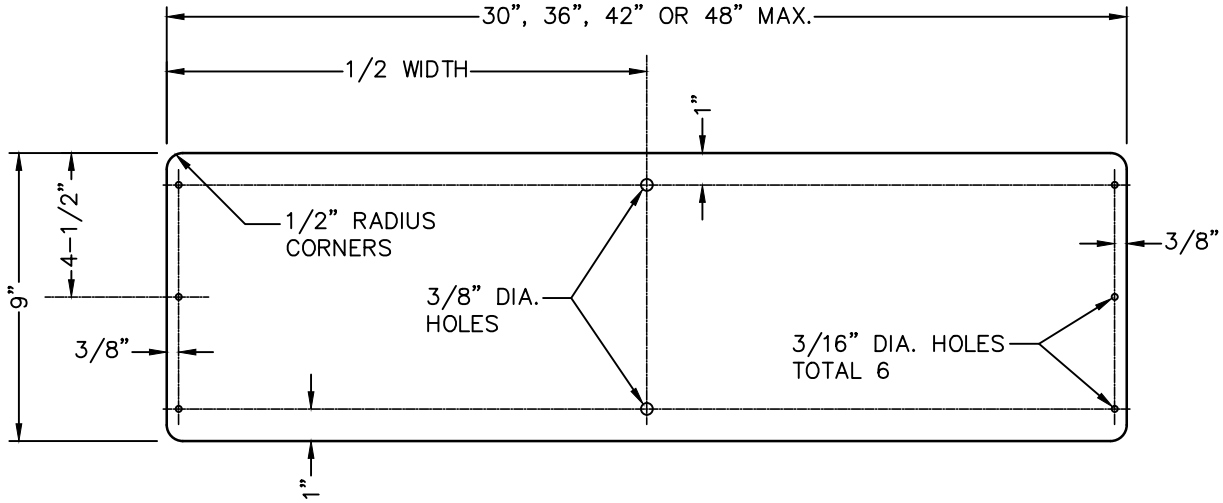
STREET NAME SIGN SIGNALIZED INTERSECTION

REVISIONS
08/25/16
BK 2016

TS–6



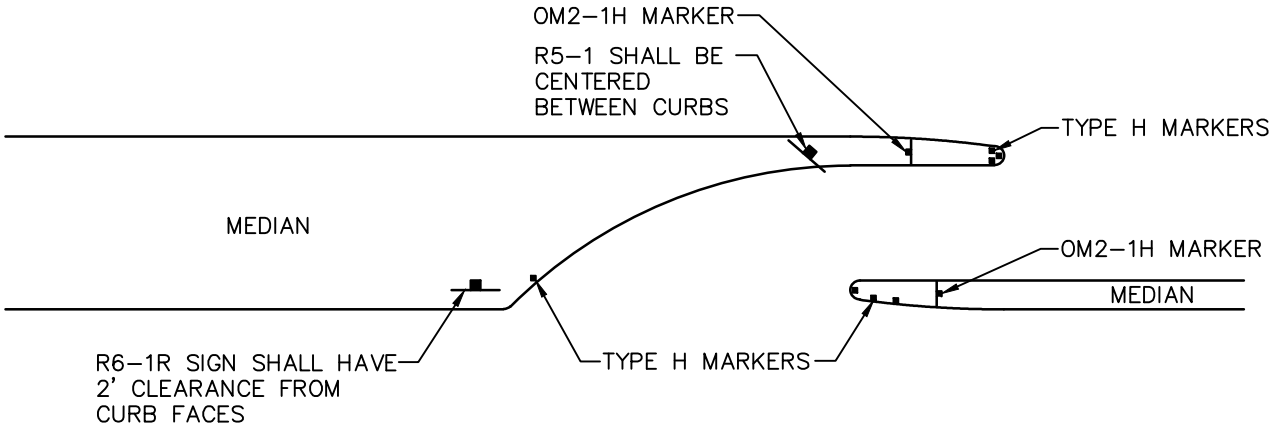
TYPE 1

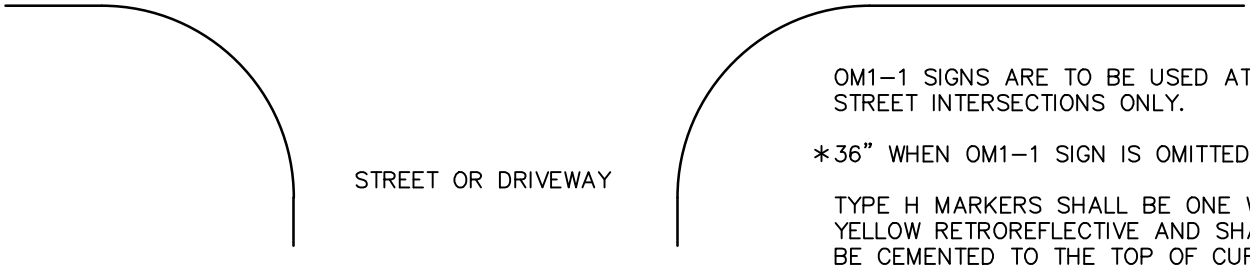


TYPE 2

NOTE:
ALL SIGN MATERIAL SHALL CONFORM TO THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS. SIGN BLANKS SHALL BE 0.08" IN THICKNESS AND SHALL BE ALUMINUM ALLOY #5052-H38. TYPE 2 SIGN BLANKS SHALL BE DRILLED AS SHOWN.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
STREET NAME BLANK	REVISIONS 08/25/16 BK 2016 — TS-7

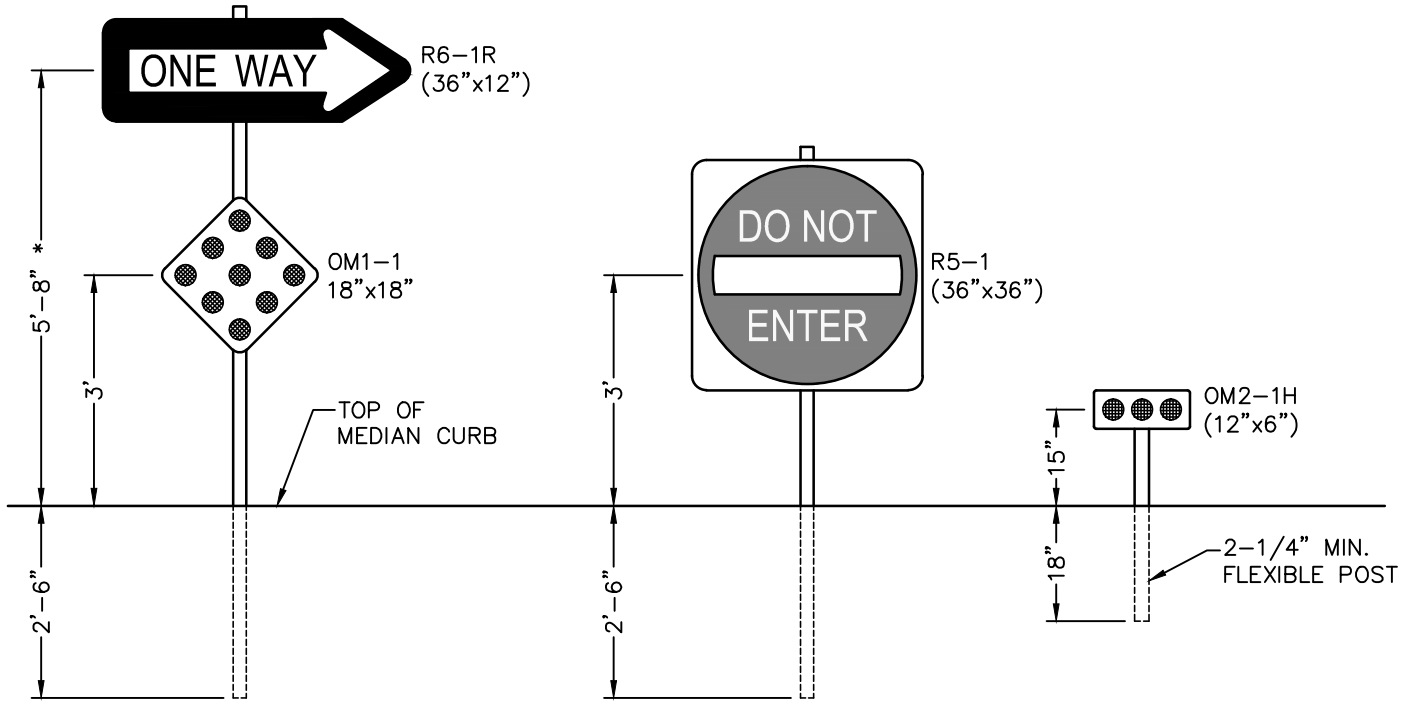




OM1-1 SIGNS ARE TO BE USED AT STREET INTERSECTIONS ONLY.

*36" WHEN OM1-1 SIGN IS OMITTED.

TYPE H MARKERS SHALL BE ONE WAY YELLOW RETROREFLECTIVE AND SHALL BE CEMENTED TO THE TOP OF CURB WITH A RAPID SET TYPE EPOXY ADHESIVE IN CONFORMANCE WITH THE MANUFACTURER'S INSTRUCTIONS.



APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 09/16/16 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

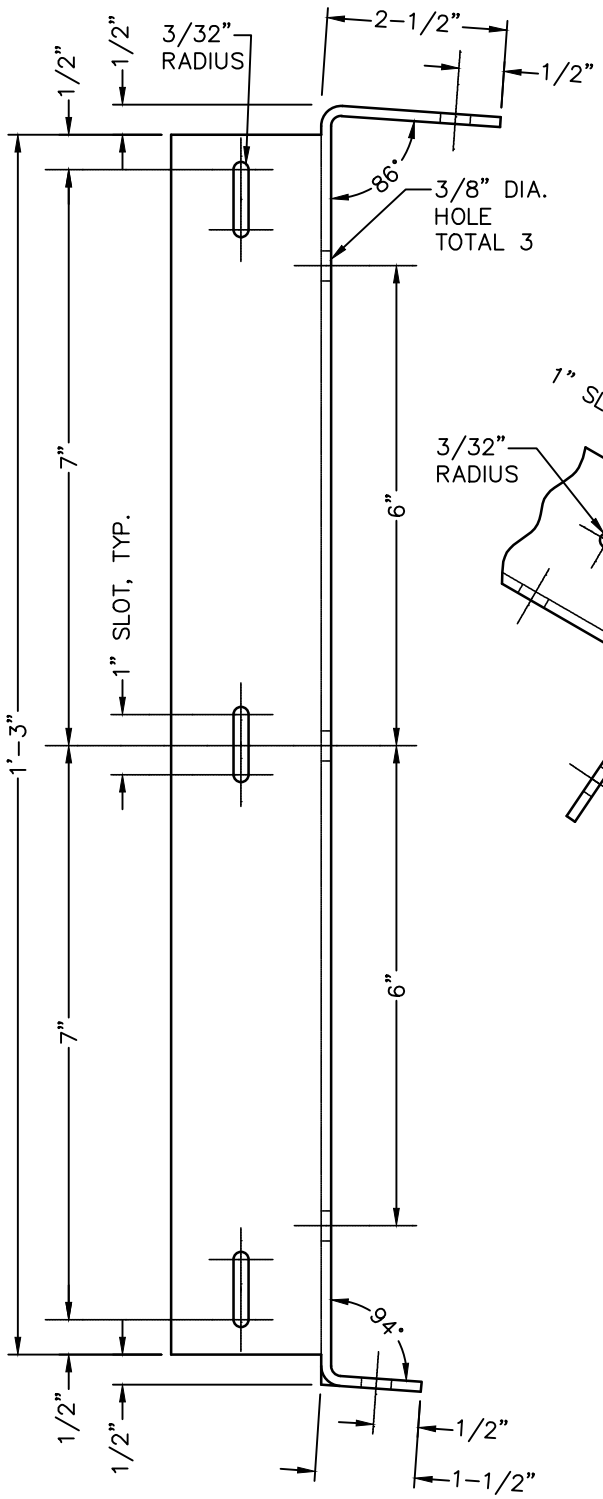
MEDIAN ISLAND OPENING SIGNING

REVISIONS
08/25/16
BK 2016

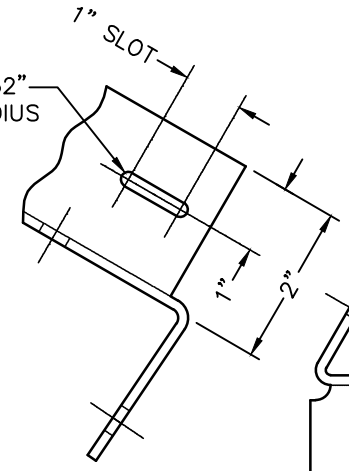
TS-8

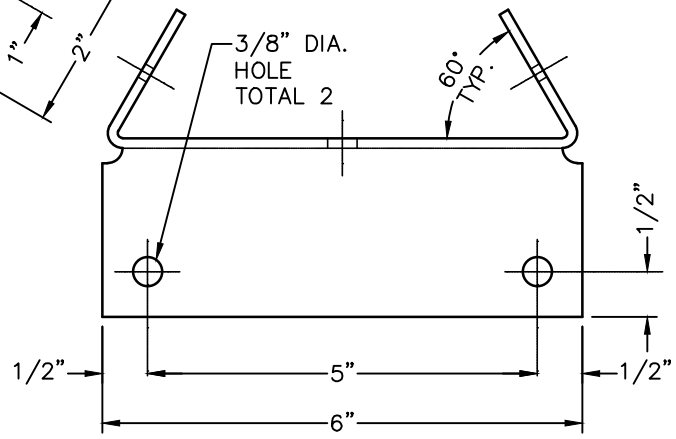
NOTES:

1. ALL MATERIAL SHALL BE 12 GAUGE HOT ROLLED STEEL SHEET, LOW CARBON COMMERCIAL QUALITY. SPECIFICATION QQS-636. GRADE 1010.
2. ALL BRACKETS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER SPECIFICATION ASTM A 123/A 123M.
3. ALL BENDS SHALL BE 1/8" RADIUS.
4. ALL SHARP EDGES SHALL BE DEBURRED.
5. TOLERANCES: DIMENSIONS 1/32"±
   ANGLES 0°30'±
6. ATTACH BRACKET TO THE TRAFFIC SIGNAL POLE USING (3) 3/4" STAINLESS STEEL BANDS, 2 FEET ABOVE THE MAST ARM CONNECTION.

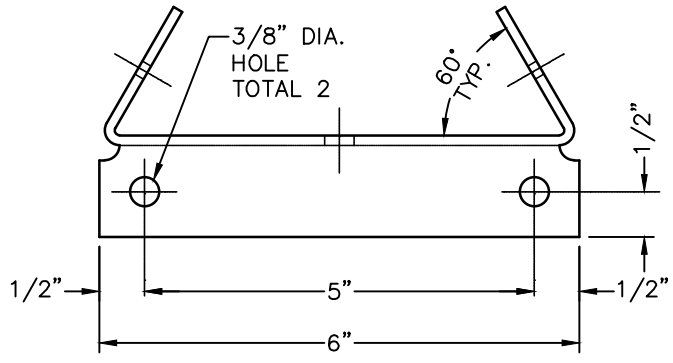


SIDE VIEW





TOP VIEW



BOTTOM VIEW

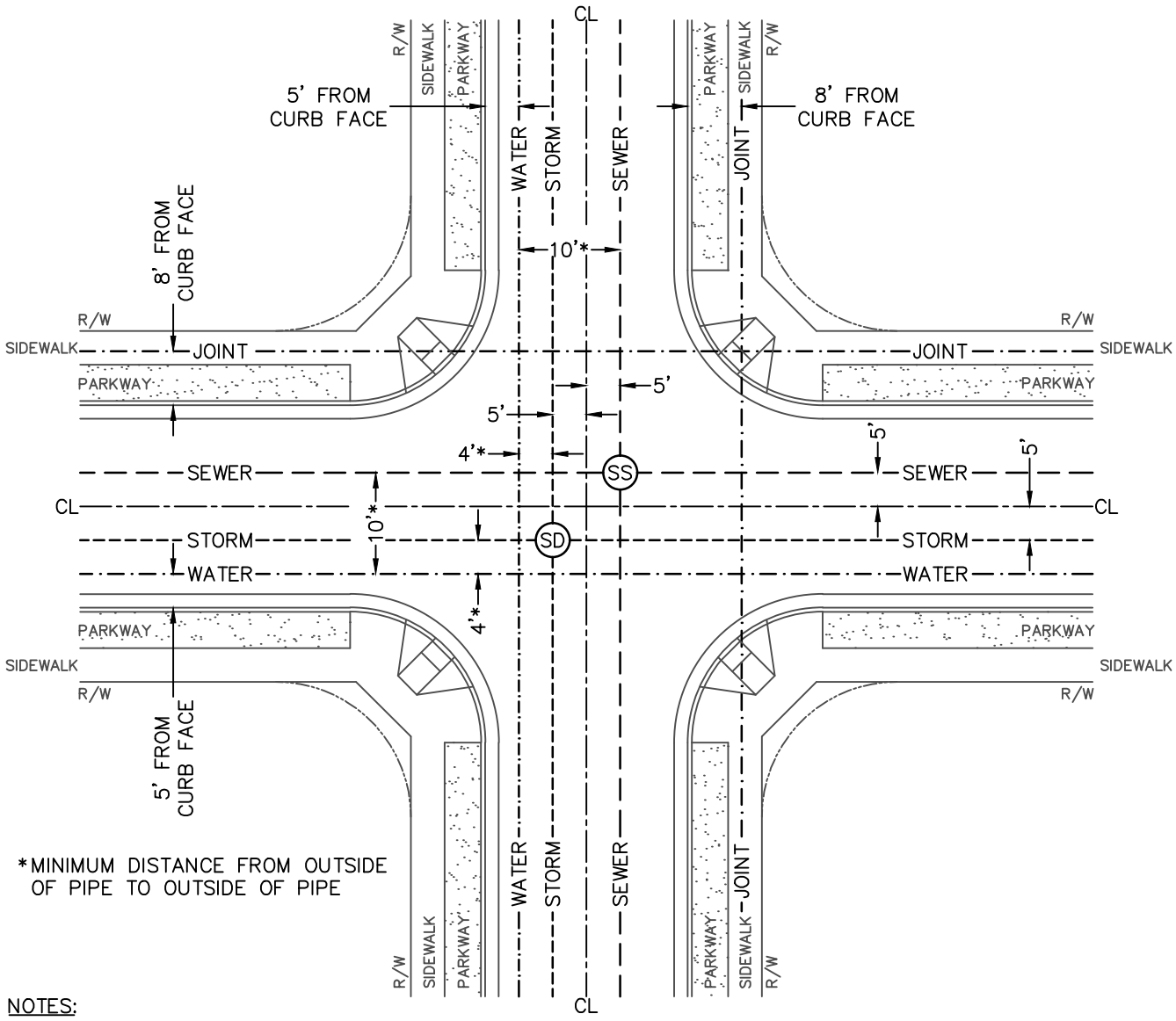
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CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

STREET NAME SIGN BRACKET

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BK_2015

TS-9



NOTES:

1. SANITARY SEWER LINES SHALL BE LOCATED NORTH OR EAST OF THE STREET CENTERLINE AND AT LEAST 10 FT HORIZONTALLY AND 1 FT LOWER THAN WATER MAIN.
2. STORM DRAIN LINES SHALL BE LOCATED SOUTH OR WEST OF THE STREET CENTERLINE.
3. WATER MAIN SHALL BE LOCATED SOUTH OR WEST OF THE STREET CENTERLINE. HORIZONTAL AND VERTICAL CLEARANCES TO SANITARY SEWER AND STORM DRAIN LINES SHALL MEET THE REQUIREMENTS OF THE "STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES GUIDANCE MEMO NO. 2003–02: GUIDANCE FOR THE SEPARATION OF WATER MAINS AND NON–POTABLE PIPELINES".
4. JOINT UTILITY FACILITIES (GAS, ELECTRIC, TELEPHONE AND CABLE TELEVISION) SHALL BE LOCATED NORTH OR EAST OF THE STREET CENTERLINE.
5. IF EXISTING UTILITY LOCATIONS DO NOT CONFORM TO THIS STANDARD, ALTERNATE LOCATIONS MAY BE APPROVED BY CITY ENGINEER.
6. UTILITY LINES SHOULD BE PLACED OUTSIDE THE TRAVELED WAY WHERE POSSIBLE.
7. MINIMUM VERTICAL SEPARATION AT ALL UTILITY CROSSINGS SHALL BE 1 FT OR AS REQUIRED BY THE UTILITY COMPANY; WHICHEVER IS MORE RESTRICTIVE.

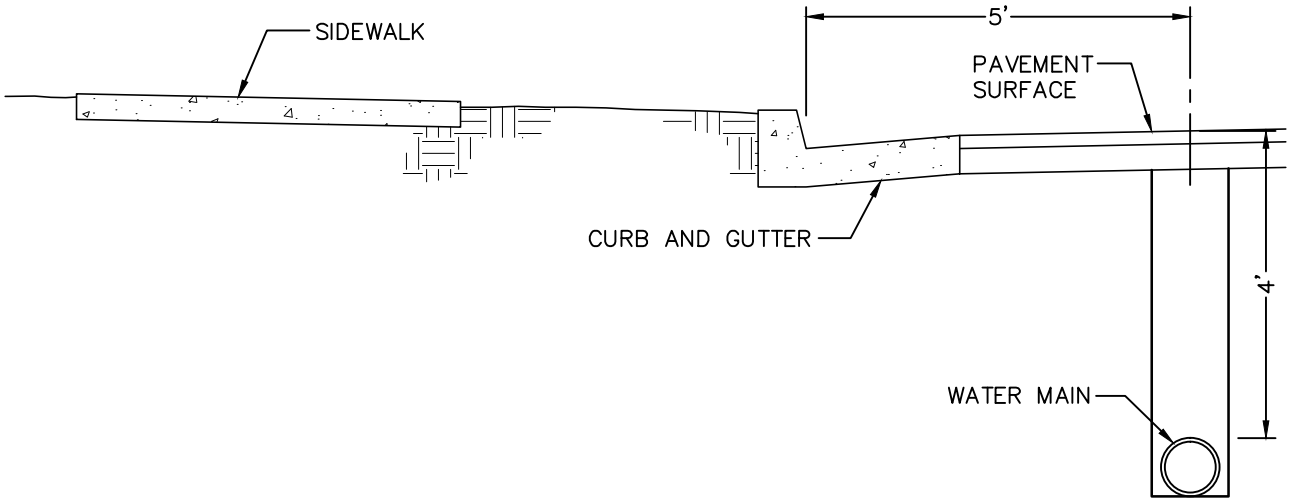
APPROVED BY: _____ 09/16/16
CITY ENGINEER R.P.E. 81734 DATE

CITY OF VISALIA
DESIGN & IMPROVEMENT STANDARDS

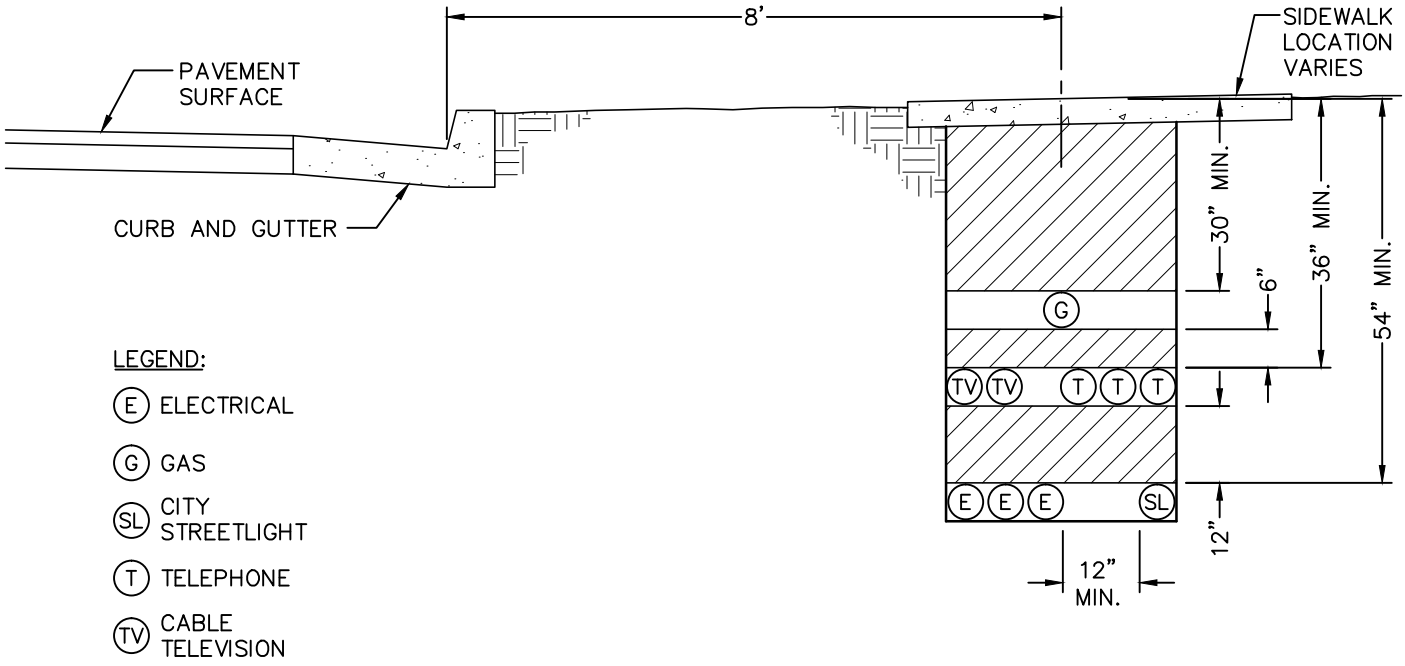
UTILITY LOCATIONS

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08/26/16
BK 2016

U–1



TYPICAL WATER MAIN TRENCH

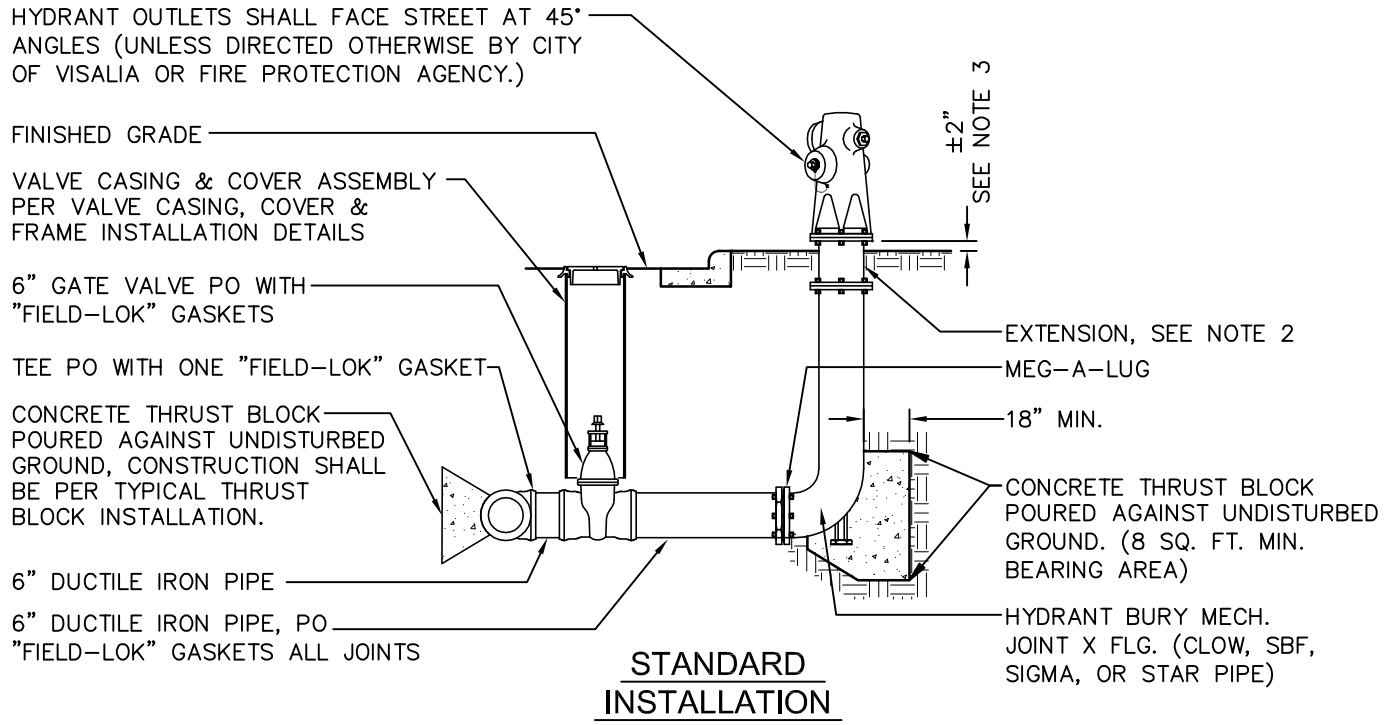


TYPICAL JOINT UTILITY TRENCH

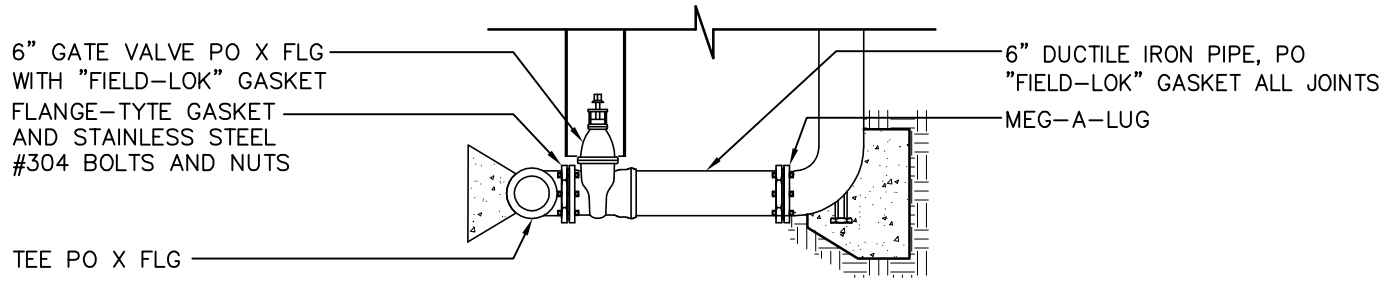
NOTES:

1. SEE TRENCH BACKFILL/PATCH PAVING STANDARD DRAWING FOR TRENCH BACKFILL STANDARDS.
2. ALTERNATE TRENCH CONFIGURATIONS MAY BE PROPOSED AND ARE SUBJECT TO APPROVAL BY THE CITY ENGINEER AND THE UTILITY COMPANIES.

APPROVED BY: _____ CITY ENGINEER R.P.E. 81734 — 09/16/16 DATE	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS	
JOINT UTILITY TRENCH	REVISIONS 09/15/16 BK 2016	U–2



STANDARD INSTALLATION



ALTERNATE INSTALLATION

NOTES:

1. ALL FIRE HYDRANT MATERIALS SHALL COMPLY WITH MATERIAL SPECIFICATIONS.
2. A HYDRANT EXTENSION MAY BE REQUIRED TO ADJUST FOR FINISHED GRADE.
3. FOR WET BARREL HYDRANTS THIS DIMENSION IS FROM FINISHED GRADE TO BURY'S FLANGE OR EXTENSION'S FLANGE WHEN AN EXTENSION IS REQUIRED.
4. PUSH-ON, FLANGED FITTING JOINTS, AND/OR THREADED-FLANGED RISERS MAY BE REQUIRED. VERIFY WITH A CITY OF VISALIA REPRESENTATIVE ALL FIRE HYDRANT MATERIAL PRIOR TO THE INSTALLATION.
5. FIRE HYDRANT BARRICADES SHALL BE REQUIRED WHEN A VERTICAL OR ROLLED CURB DOES NOT EXIST, OR WHEN THE FIRE HYDRANT NEEDS TO BE PROTECTED FROM MOVING VEHICLES.
6. ALL MACHINE BOLTS AND NUTS SHALL BE #304 STAINLESS STEEL, EXCEPT FOR BREAKOFF BOLTS.
7. A 90° ELBOW WITH "FIELD-LOK" GASKETS MAY BE REQUIRED FOR THE FIRE HYDRANT INSTALLATION WHEN SPACE IS LIMITED AND THE HYDRANT LEAD MUST RUN PARALLEL TO THE MAIN OR THE LOCATION OF THE FIRE HYDRANT REQUIRES THE BEND.

APPROVED BY: _____ PUBLIC WORKS DIRECTOR R.C.E. 50022 DATE 09/16/16	CITY OF VISALIA DESIGN & IMPROVEMENT STANDARDS
TYPICAL FIRE HYDRANT INSTALLATION	REVISIONS 11/26/07 — W-1

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Attachment	Title	Description / Contents
Attachment A	**State Water Resources Control Board Order No. 2022-0103-DWQ**	Statewide General Waste Discharge Requirements for Sanitary Sewer Systems. Includes *Attachment D – Sewer System Management Plan Required Elements* detailing mandatory SSMP components and performance expectations.
Attachment B	**City of Visalia Municipal Code – Title 13 (Chapter 13.08 Sanitary Sewer System Regulations)**	Provides the City's legal authority for the construction, connection, use, and maintenance of sanitary sewers; prevention of unauthorized discharges; and enforcement of the Sewer Use Ordinance.
Attachment C	**Glossary of Terms and Acronyms**	Definitions of key regulatory, operational, and technical terms used throughout the SSMP.

STATE WATER RESOURCES CONTROL BOARD
1001 I Street, Sacramento, California 95814
ORDER WQ 2022-0103-DWQ

STATEWIDE WASTE DISCHARGE REQUIREMENTS

GENERAL ORDER FOR SANITARY SEWER SYSTEMS

This Order was adopted by the State Water Resources Control Board on December 6, 2022.
This Order shall become effective **180 days after the Adoption Date of this General Order,** on June 5, 2023. The Enrollee shall comply with the requirements of this Order upon the Effective Date of this General Order.

This General Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, protect the Enrollee from liability under federal, state, or local laws, nor create a vested right for the Enrollee to continue the discharge of waste.

CERTIFICATION

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the State Water Board on December 6, 2022.

AYE:	Chair E. Joaquin Esquivel Vice Chair Dorene D'Adamo Board Member Sean Maguire Board Member Laurel Firestone Board Member Nichole Morgan
NAY:	None
ABSENT:	None
ABSTAIN:	None

Courtney Tyler for
Jeanine Townsend
Clerk to the Board

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1. INTRODUCTION

This General Order regulates sanitary sewer systems designed to convey sewage. For the purpose of this Order, a sanitary sewer system includes, but is not limited to, pipes, valves, pump stations, manholes, siphons, wet wells, diversion structures and/or other pertinent infrastructure, upstream of a wastewater treatment plant headworks. A sanitary sewer system includes:

- Laterals owned and/or operated by the Enrollee;
- Satellite sewer systems; and/or
- Temporary conveyance and storage facilities, including but not limited to temporary piping, vaults, construction trenches, wet wells, impoundments, tanks and diversion structures.

Sewage is untreated or partially treated domestic, municipal, commercial and/or industrial waste (including sewage sludge), and any mixture of these wastes with inflow or infiltration of stormwater or groundwater, conveyed in a sanitary sewer system. Sewage contains high levels of suspended solids, non-digested organic waste, pathogenic bacteria, viruses, toxic pollutants, nutrients, oxygen-demanding organic compounds, oils, grease, pharmaceuticals, and other harmful pollutants.

For the purpose of this General Order, a spill is a discharge of sewage from any portion of a sanitary sewer system due to a sanitary sewer system overflow, operational failure, and/or infrastructure failure. Sewage and its associated wastewater spilled from a sanitary sewer system may threaten public health, beneficial uses of waters of the State, and the environment.

This General Order serves as statewide waste discharge requirements and supersedes the previous State Water Resources Control Board (State Water Board) Order 2006-0003-DWQ and amendments thereafter. All sections and attachments of this General Order are enforceable by the State Water Board and Regional Water Quality Control Boards (Regional Water Boards). Through this General Order, the State Water Board requires an Enrollee to:

- Comply with federal and state prohibitions of discharge of sewage to waters of the State, including federal waters of the United States;
- Comply with specifications, and notification, monitoring, reporting and recordkeeping requirements in this General Order that implement the federal Clean Water Act, the California Water Code (Water Code), water quality control plans (including Regional Water Board Basin Plans) and policies;
- Proactively operate and maintain resilient sanitary sewer systems to prevent spills;
- Eliminate discharges of sewage to waters of the State through effective implementation of a Sewer System Management Plan;
- Monitor, track, and analyze spills for ongoing system-specific performance improvements; and
- Report noncompliance with this General Order per reporting requirements.

An Enrollee is a public, private, or other non-governmental entity that has obtained approval for regulatory coverage under this General Order, including:

- A state agency, municipality, special district, or other public entity that owns and/or operates one or more sanitary sewer systems:
  - greater than one (1) mile in length (each individual sanitary sewer system);
  - one (1) mile or less in length where the State Water Board or a Regional Water Board requires regulatory coverage under this Order; or
- A federal agency, private company, or other non-governmental entity that owns and/or operates a sanitary sewer system of any size where the State Water Board or a Regional Water Board requires regulatory coverage under this Order in response to a history of spills, proximity to surface water, or other factors supporting regulatory coverage.

For the purpose of this Order, a sanitary sewer system includes only systems owned and/or operated by the Enrollee.

2. REGULATORY COVERAGE AND APPLICATION REQUIREMENTS

2.1. Requirements for Continuation of Existing Regulatory Coverage

To continue regulatory coverage from previous Order 2006-0003-DWQ under this General Order, **within the 60-days-prior-to the Effective Date of this General Order**, the Legally Responsible Official of an existing Enrollee shall electronically certify the Continuation of Existing Regulatory Coverage form in the online California Integrated Water Quality System (CIWQS) Sanitary Sewer System Database. The Legally Responsible Official will receive an automated CIWQS-issued Notice of Applicability email, confirming continuation of regulatory coverage under this General Order. All regulatory coverage under previous Order 2006-0003-DWQ will cease on the Effective Date of this Order.

An Enrollee continuing existing regulatory coverage is not required to submit a new application package or pay an application fee for enrollment under this General Order. The annual fee due date for continued regulatory coverage from previous Order 2006-0003-DWQ to this General Order remains unchanged.

A previous Enrollee of Order 2006-0003-DWQ that fails to certify the Continuation of Existing Regulatory Coverage form in the online CIWQS database by the Effective Date of this Order is considered a New Applicant, and will not have regulatory coverage for its sanitary sewer system(s) until:

- A new application package for system(s) enrollment is submitted per section 2.2 (Requirements for New Regulatory Coverage) below; and
- The new application package is approved per section 2.2.2 (Approval of Application Package (For New Applicants Only)).

2.2. Requirements for New Regulatory Coverage

No later than 60 days prior to commencing and/or assuming operation and maintenance responsibilities of a sanitary sewer system, a duly authorized representative that

maintains legal authority over the public or private sanitary sewer system is required to enroll under this General Order by submitting a complete application package as specified below and as provided in Attachment B (Application for Enrollment Form) of this General Order.

Unless required by a Regional Water Board, a public agency that owns a combined sewer system subject to the Combined Sewer Overflow Control Policy (33 U.S. Code § 1342(q)), is not required to enroll, under this Order, the portions of its sanitary sewer system(s) that collects combined sanitary wastewater and stormwater.

2.2.1. Application Package Requirements

The Application for Enrollment package for new applicants must include the following items:

- **Application for Enrollment Form**. The form in Attachment B of this General Order must be completed, signed, and certified by a Legally Responsible Official, in accordance with section 5.1 (Designation of a Legally Responsible Official) of this General Order. If an electronic Application for Enrollment form is available at the time of application, a new applicant shall submit its application form electronically; and
- **Application Fee**. A fee payable to the "State Water Resources Control Board" in accordance with the Fee Schedule in the California Code of Regulations, Title 23, section 2200, or subsequent fee regulations updates.

  The application fee for this General Order is based on the sanitary sewer system's threat to water quality and complexity designations of category 2C or 3C, which is assigned based on the population served by the system. The current Fee Schedule for sanitary sewer systems is listed under subdivision (a)(2) at the following website: Fee Schedule (https://www.waterboards.ca.gov/resources/fees/water_quality/).

2.2.2. Approval of Application Package (For New Applicants Only)

The Deputy Director of the State Water Board, Division of Water Quality (Deputy Director) will consider approval of each complete Application for Enrollment package. The Deputy Director will issue a Notice of Applicability letter which serves as approved regulatory coverage for the new Enrollee.

If the submitted application package is not complete in accordance with section 2.2.1 (Application Package Requirements) of this General Order, the Deputy Director will send a response letter to the applicant outlining the application deficiencies. The applicant will have 60 days from the date of the response letter to correct the application deficiencies and submit the identified items necessary to complete the application package to the State Water Board.

2.2.3. Electronic Reporting Account for New Enrollee

Within 30 days after the date of the Approval of Complete Application Package for System Enrollment, a duly authorized representative for the Enrollee shall obtain a CIWQS Sanitary Sewer System Database user account by clicking the "User Registration" button and following the directions on the CIWQS Login Page

(https://ciwqs.waterboards.ca.gov). If additional assistance is needed to establish an online CIWQS user account, contact State Water Board staff by email at CIWQS@waterboards.ca.gov. The online user account will provide the Enrollee secure access to the online CIWQS database for electronic reporting.

2.3. Regulatory Coverage Transfer

Regulatory coverage under this General Order is not transferable to any person or party except after an existing Enrollee submits a written request for a regulatory coverage transfer to the Deputy Director, at least 60 days in advance of any proposed system ownership transfer. The written request must include a written agreement between the existing Enrollee and the new Enrollee containing:

- Acknowledgement that the transfer of ownership is solely of an existing system with an existing waste discharge identification (WDID) number;
- The specific ownership transfer date in which the responsibility and regulatory coverage transfer between the existing Enrollee and the new Enrollee becomes effective; and
- Acknowledgement that the existing Enrollee is liable for violations occurring up to the ownership transfer date and that the new Enrollee is liable for violations occurring on and after the ownership transfer date.

The Deputy Director will consider approval of the written request. If approved, the Deputy Director will issue a Notice of Applicability letter which serves as an approved transfer of regulatory coverage to the new Enrollee.

3. FINDINGS

3.1. Legal Authorities

3.1.1. Federal and State Regulatory Authority

The objective of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the waters of the United States (33 U.S.C. 1251). The Water Code authorizes the State Water Board to implement the Clean Water Act in the State and to protect the quality of all waters of the State (Water Code sections 13000 and 13160).

3.1.2. Discharge of Sewage

A discharge of untreated or partially treated sewage is a discharge of waste as defined in Water Code section 13050(d) that could affect the quality of waters of the State and is subject to regulation by waste discharge requirements issued pursuant to Water Code section 13263 and Chapter 9, Division 3, Title 23 of the California Code of Regulations. A discharge of sewage may pollute and alter the quality of the waters of the State to a degree that unreasonably affects the beneficial uses of the receiving water body or facilities that serve those beneficial uses (Water Code section 13050(l)(1)).

3.1.3 Water Boards Authority to Require Technical Reports, Monitoring, and Reporting

Water Code sections 13267 and 13383 authorize the Regional Water Boards and the State Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. Water Code section 13267(b), authorizes the Regional Water Boards to "require any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region… or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of water within its region shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires…In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports and shall identify the evidence that supports requiring that person to provide the reports." Water Code section 13267(f) authorizes the State Water Board to require this information if it consults with the Regional Water Boards and determines that it will not duplicate the efforts of the Regional Water Boards. The State Water Board has consulted with the Regional Water Boards and made this determination.

The technical and monitoring reports required by this General Order and Attachment E (Notification, Monitoring, Reporting and Recordkeeping Requirements) are necessary to evaluate and ensure compliance with this General Order. The effort to develop required technical reports will vary depending on the system size and complexity and the needs of the specific technical report. The burden and cost of these reports are reasonable and consistent with the interest of the state in protecting water quality, which is the primary purpose of requiring the reports.

Water Code section 13383(a) authorizes the Water Boards to "establish monitoring, inspection, entry, reporting, and recordkeeping requirements… for any person who discharges, or proposes to discharge, to navigable waters, any person who introduces pollutants into a publicly owned treatment works, any person who owns or operates, or proposes to own or operate, a publicly owned treatment works or other treatment works treating domestic sewage, or any person who uses or disposes, or proposes to use or dispose, of sewage sludge." Section 13383(b) continues, "the state board or the regional boards may require any person subject to this section to establish and maintain monitoring equipment or methods, including, where appropriate, biological monitoring methods, sample effluent as prescribed, and provide other information as may be reasonably required."

Reporting of spills from privately owned sewer laterals and systems pursuant to section 5.15 (Voluntary Reporting of Spills from Privately-Owned Sewer Laterals and/or Private Sanitary Sewer Systems) of this General Order is authorized by Water Code section 13225(c) and encouraged by the State Water Board, wherein a local agency may investigate and report on any technical factors involved in water quality control provided the burden including costs of such reports bears a reasonable relationship to the need for the report and the benefits to be obtained therefrom. The burden of reporting private spills under section 5.15 (Voluntary Reporting of Spills from Privately-Owned Sewer Laterals and/or Private Sanitary Sewer Systems) is minimal and is outweighed by the benefit of providing Regional Water Boards an opportunity to respond to these spills

when an Enrollee, which in many cases has a contractual relationship with the owner of the private system, has knowledge of the spills.

3.1.4. Water Board Authority to Prescribe General Waste Discharge Requirements

Water Code section 13263(i) provides that the State Water Board may prescribe general waste discharge requirements for a category of discharges if the State Water Board finds or determines that:

- The discharges are produced by the same or similar operations;
- The discharges involve the same or similar types of waste;
- The discharges require the same or similar treatment standards; and
- The discharges are more appropriately regulated under general waste discharge requirements than individual waste discharge requirements.

Since 2006, the State Water Board has been regulating over 1,100 publicly owned sanitary sewer systems (See section 3.1.5 (Previous Statewide General Waste Discharge Requirements) of this General Order). California also has a large unknown number of unregulated privately owned sanitary sewer systems. All waste conveyed in publicly owned and privately owned sanitary sewer systems (as defined in this General Order) is comprised of untreated or partially treated domestic waste and/or industrial waste. Generally, sanitary sewer systems are designed and operated to convey waste by gravity or under pressure; system-specific design elements and system-specific operations do not change the common nature of the waste, the common threat to public health, or the common impacts on water quality. Spills of waste from a sanitary sewer system prior to reaching the ultimate downstream treatment facility are unauthorized and enforceable by the State Water Board and/or a Regional Water Board. Therefore, spills from sanitary sewer systems are more appropriately regulated under general waste discharge requirements.

As specified in Water Code sections 13263(a) and 13241, the implementation of requirements set forth in this Order is for the reasonable protection of past, present, and probable future beneficial uses of water and the prevention of nuisance. The requirements implement the water quality control plans (Basin Plans) for each Regional Water Board and take into account the environmental characteristics of sewer service areas and hydrographic units within the state. Additionally, the State Water Board has considered water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality, costs associated with compliance with these requirements, the need for developing housing within California, and the need to protect sources of drinking water and other water supplies.

3.1.5. Previous Statewide General Waste Discharge Requirements

On May 2, 2006, the State Water Board adopted Order 2006-0003-DWQ serving as Waste Discharge Requirements pursuant to Article 4, Chapter 4, Division 7 of the Water Code (commencing with section 13260) for inadvertent discharges to waters of the State. Order 2006-0003-DWQ prohibited discharges of untreated or partially treated sewage. Order 2006-0003-DWQ also required system-specific management, operation, and maintenance of publicly owned sewer systems greater than one mile in length.

To decrease the impacts on human health and the environment caused by sewage spills, the previous Order required enrollees to develop a rehabilitation and replacement plan that identifies system deficiencies and prioritizes short-term and long-term rehabilitation actions. The previous Order also required enrollees to:

1. Maintain information that can be used to establish and prioritize appropriate Sewer System Management Plan activities; and
2. Implement a proactive approach to reduce spills.

The previous Order required Sewer System Management Plan elements for "the proper and efficient management, operation, and maintenance of sanitary sewer systems, while taking into consideration risk management."

On July 30, 2013, the State Water Board amended General Order 2006-0003-DWQ with Order WQ 2013-0058-EXEC, Amending Monitoring and Reporting Program for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems.

Many enrollees of Order 2006-0003-DWQ have already implemented proactive measures to reduce sewage spills. Other enrollees, however, still need technical assistance and funding to improve sanitary sewer system operation and maintenance for the reduction of sewage spills.

3.1.6. Existing Memorandum of Agreement with California Water Environment Association

The California Water Environment Association is a nonprofit organization dedicated to providing water industry certifications, training, and networking opportunities. The Association's Technical Certification Program provides accredited sanitary sewer system operator certification for collection system operators and maintenance workers.

On February 10, 2016, the State Water Board entered into a collaborative agreement with the Association titled *Memorandum of Agreement Between the California State Water Resources Control Board and the California Water Environment Association - Training Regarding Requirements Set Forth in Statewide General Waste Discharge Requirements for Sanitary Sewer Systems*. The Memorandum sets forth collaborative training necessary for regulated sanitary sewer system personnel to operate and maintain a well operating system and ensure full compliance with statewide sewer system regulations.

On March 15, 2018, the State Water Board and the California Water Environment Association amended the existing Memorandum of Agreement to include collaborative outreach and expand training needs associated with further updates to Water Board regulations for sanitary sewer systems. The State Water Board encourages further Agreement updates as necessary to support improved sewer system operations and the professionalism of collection system operators.

3.2. General

3.2.1. Waters of the State

Waters of the State include any surface water or groundwater, including saline waters, within the boundaries of the state as defined in Water Code section 13050(e), and are inclusive of waters of the United States.

3.2.2. Sanitary Sewer System Spill Threats to Public Health and Beneficial Uses

Sewage contains high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen-demanding organic compounds, oil and grease and other pollutants. Sewage spills may cause a public nuisance, particularly when sewage is discharged to areas with high public exposure such as streets and surface waters used for drinking, irrigation, fishing, recreation, or other public consumption or contact uses.

More specifically, sanitary sewer spills may:

- Adversely affect aquatic life and/or threaten water quality when reaching receiving waters;
- Inadvertently release trash, including plastics;
- Impair the recreational use and aesthetic enjoyment of surface waters by polluting surface water or groundwater;
- Threaten public health through direct public exposure to bacteria, viruses, intestinal parasites, and other microorganisms that can cause serious illness such as gastroenteritis, hepatitis, cryptosporidiosis, and giardiasis;
- Negatively impact ecological receptors and biota within surface waters; and
- Cause nuisance including odors, closure of beaches and recreational areas, and property damage.

Sanitary sewer system spills may pollute receiving waters and threaten beneficial uses of surface water and groundwater. Potentially threatened beneficial uses include, but are not limited to the following (with associated acronym representations as included in statewide water quality control plans and Regional Water Boards' Basin Plans):

- Municipal and Domestic Supply (MUN)
- Water Contact Recreation (REC-1) and Non-Contact Water Recreation (REC-2)
- Cold Freshwater Habitat (COLD)
- Warm Freshwater Habitat (WARM)
- Native American Culture (CUL)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Wetland Habitat (WET)
- Agricultural Supply (AGR)
- Estuarine Habitat (EST)

- Commercial and Sport Fishing (COMM)
- Subsistence Fishing (SUB)
- Tribal Tradition and Culture (CUL)
- Tribal Subsistence Fishing (T-SUB)
- Aquaculture (AQUA)
- Marine Habitat (MAR)
- Preservation of Biological Habitats of Special Significance (BIOL)
- Migration of Aquatic Organisms (MIGR)
- Shellfish Harvesting (SHELL)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Hydropower Generation (POW)
- Navigation (NAV)
- Flood Peak Attenuation/Flood Water Storage (FLD)
- Water Quality Enhancement (WQE)
- Fresh Water Replenishment (FRSH)
- Groundwater Recharge (GWR)
- Inland Saline Water Habitat (SAL)

3.2.3. Proactive Sanitary Sewer System Management to Eliminate Spill Causes

Finding 3 of the previous Order, 2006-0003-DWQ, states: “Sanitary sewer systems experience periodic failures resulting in discharges that may affect waters of the state. There are many factors (including factors related to geology, design, construction methods and materials, age of the system, population growth, and system operation and maintenance), which affect the likelihood of an SSO [sanitary sewer overflow]. A proactive approach that requires Enrollees to ensure a system-wide operation, maintenance, and management plan is in place will reduce the number and frequency of SSOs within the state. This approach will in turn decrease the risk to human health and the environment caused by SSOs.”

Many spills are preventable through proactive attention on sanitary sewer system management using the best practices and technologies available to address major causes of spills, including but not limited to:

- Blockages from sources including but not limited to:
  - Fats, oils and grease;
  - Tree roots;
  - Rags, wipes and other paper, cloth and plastic products; and
  - Sediment and debris.
- Sewer system damage and exceedance of sewer system hydraulic capacity from identified system-specific environmental, and climate-change impacts, including but not limited to:

- Sea level rise impacts including flooding, coastal erosion, seawater intrusion, tidal inundation and submerged lands;
- Increased surface water flows due to higher intensity rain events;
- Flooding;
- Wildfires and wildfire induced impacts;
- Earthquake induced damage;
- Landslides; and
- Subsidence.

- Infrastructure deficiencies and failures, including but not limited to:
  - Pump station mechanical failures;
  - System age;
  - Construction material failures;
  - Manhole cover failures;
  - Structural failures; and
  - Lack of proper operation and maintenance.
- Insufficient system capacity (temporary or sustained), due to factors including but not limited to:
  - Excessive and/or increased storm or groundwater inflow/infiltration;
  - Insufficient capacity due to population increase and/or new connections from industrial, commercial and other system users; and
  - Stormwater capture projects utilizing a sanitary sewer system to convey stormwater to treatment facilities for reuse.
- Community impacts, including but not limited to:
  - Power outages;
  - Vandalism; and
  - Contractor-caused or other third party-caused damages.

3.2.4. Underground Sanitary Sewer System Leakage

Portions of some sanitary sewer systems may leak, causing underground exfiltration (exiting) of sewage from the system. Exfiltrated sewage that remains in the underground infrastructure trench and/or the soil matrix, and that does not discharge into waters of the State (surface water or groundwater) may not threaten beneficial uses.

Underground exfiltrated sewage may threaten beneficial uses if discharged to waters of the State. Exfiltrated sewage that discharges to groundwater may impact beneficial uses of groundwater and pollute groundwater supply. Additionally, if in close proximity, exfiltrated sewage may enter into a compromised underground drainage conveyance system that discharges into a water of the United States, or into groundwater that is hydrologically connected to (feeds into) a water of the United States, thus potentially causing: (1) a Clean Water Act violation, (2) threat and impact to beneficial uses, and/or (3) surface water pollution.

3.2.5. Proactive Sanitary Sewer System Management to Reduce Inflow and Infiltration

Excessive inflow (stormwater entering) and infiltration (groundwater seepage entering) to sanitary sewer systems is preventable through proactive sewer system management using the best practices and technologies available. The efficiency of the downstream wastewater treatment processes is dependent on the performance of the sanitary sewer system. When the structural integrity of a sanitary sewer system deteriorates, high volumes of inflow and infiltration can enter the sewer system. High levels of inflow and infiltration increase the hydraulic load on the downstream treatment plant, which can reduce treatment efficiency, lead to bypassing a portion of the treatment process, cause illegal discharge of partially treated effluent, or in extreme situations make biological treatment facilities inoperable (e.g., wash out the biological organisms that treat the waste).

3.3. Water Quality Control Plans, Policies and Resolutions

The nine Regional Water Boards have adopted region-specific water quality control plans (commonly referred to as Basin Plans) that designate beneficial uses, establish water quality objectives, and contain implementation programs and policies to achieve those objectives. The State Water Board has adopted statewide water quality control plans, policies and resolutions establishing statewide water quality objectives, implementation programs and initiatives.

3.3.1. State Water Board Antidegradation Policy

On October 28, 1968, the State Water Board adopted Resolution 68-16, titled Statement of Policy with Respect to Maintaining High Quality of Waters in California, which incorporates the federal antidegradation policy. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings.

The continued prohibition of sewage discharges from sanitary sewer systems into waters of the State aligns with Resolution 68-16. A sewage discharge from sanitary sewers to waters of the State is prohibited by this Order. Therefore, this Order does not allow degradation of waters of the State. In addition, this Order: (1) further expands the existing prohibition of sewage discharges to include waters of the State, in addition to waters of the United States as provided in previous Order 2006-0003-DWQ, and (2) enhances the ability for Water Board enforcement of violations of the established prohibitions.

3.3.2. State Water Board Sources of Drinking Water Policy

On May 19,1988, the State Water Board adopted Resolution 88-63 (amended on February 1, 2006), titled Sources of Drinking Water, establishing state policy that all waters of the State, with certain exceptions, are suitable or potentially suitable for municipal or domestic supply.

3.3.3. State Water Board Cost of Compliance Resolution

On September 24, 2013, the State Water Board adopted Resolution 2013-0029, titled Directing Actions in Response to Efforts by Stakeholders on Reducing Costs of

Compliance While Maintaining Water Quality Protection. Through this resolution, the State Water Board committed to continued stakeholder engagement in identifying and implementing measures to reduce costs of compliance with regulatory orders while maintaining water quality protection and improving regulatory program outcomes.

3.3.4. State Water Board Human Right to Water Resolution

On February 16, 2016, the State Water Board adopted Resolution 2016-0010, titled Adopting the Human Right to Water as a Core Value and Directing its Implementation in Water Board Programs and Activities, addressing the human right to water as a core value and directing Water Board programs to implement requirements to support safe drinking water for all Californians.

On November 16, 2021, the State Water Board adopted Resolution 2021-0050 titled Condemning Racism, Xenophobia, Bigotry, and Racial Injustice, and Strengthening Commitment to Racial Equity, Diversity, Inclusion, Access, and Anti-racism. Among other actions, through Resolution 2021-0050, the State Water Board, in summary as corresponding to this General Order, reaffirms its commitment to its Human Right to Water resolution, upholding that every human being in California deserves safe, clean, affordable, and accessible water for human consumption, cooking, and sanitation purposes. Resolution 2021-0050 provides the State Water Board commitment to:

- Protect public health and beneficial uses of waterbodies in all communities, including communities disproportionately burdened by wastes discharge of waste to land and surface water;
- Restore impaired surface waterbodies and degraded aquifers; and
- Promote multi-benefit water quality projects.

Through Resolution 2021-0050, the State Water Board also commits to expanding implementation of its Climate Change Resolution to address the disproportionate effects of extreme hydrologic conditions and sea-level rise on Black, Indigenous, and people of color communities, prioritizing:

- The right to safe, clean, affordable, and accessible drinking water and sanitation;
- Sustainable management and protection of local groundwater resources;
- Healthy watersheds; and
- Access to surface waterbodies that support subsistence fishing.

On June 7, 2022, the State Water Board adopted a Resolution, titled Authorizing the Executive Director or Designee to Enter into One or More Multi-Year Contracts Up to a Combined Sum of $4,000,000 for a Statewide Wastewater Needs Assessment, supporting the equitable access to sanitation for all Californians and implementation of Resolutions 2016-0010 and 2021-0050.

This General Order supports the State Water Board priority in collecting a comprehensive set of data for California's wastewater systems, including sanitary sewer systems. Data reported per the requirements of this Order will be used with data from other Water Boards' programs, to further develop criteria and create a statewide risk

framework to prioritize critical funding and infrastructure investments for California's most vulnerable populations, including disadvantaged or severely disadvantaged communities with inadequate or failing sanitation systems and threatened access to healthy drinking water supplies.

3.3.5. State Water Board Open Data Resolution

On July 10, 2018, the State Water Board adopted Resolution 2018-0032, titled Adopting Principles of Open Data as a Core Value and Directing Programs and Activities to Implement Strategic Actions to Improve Data Accessibility and Associated Innovation, directing regulatory programs to assure all monitoring and reporting requirements support the State Water Boards' Open Data Initiative.

3.3.6. State Water Board Response to Climate Change

On March 7, 2017, the State Water Board adopted Resolution 2017-0012, titled Comprehensive Response to Climate Change, requiring a proactive response to climate change in all California Water Board actions, with the intent to embed climate change consideration into all programs and activities.

3.4. California Environmental Quality Act

The adoption of this Order is an action to reissue general waste discharge requirements that is exempt from the California Environmental Quality Act (Public Resources Code section 21000 et seq.) because it is an action taken by a regulatory agency to assure the protection of the environment and the regulatory process involves procedures for protection of the environment (Cal. Code Regs., Title 14, section 15308). In addition, the action to adopt this Order is exempt from CEQA pursuant to Cal. Code Regs., Title 14, section 15301, to the extent that it applies to existing sanitary sewer collection systems that constitute "existing facilities" as that term is used in sections 15301 and 15302, to the extent that it results in the repair or replacement of existing systems involving negligible or no expansion of capacity.

3.5. State Water Board Funding Assistance for Compliance with Water Board Water Quality Orders

The State Water Board, Division of Financial Assistance administers the implementation of the State Water Board financial assistance programs, per Board-adopted funding policies. Among other funding areas, the Division administers loan and grant funding for the planning and construction of wastewater and water recycling facilities per funding program-specific policies and guidelines. Applicants may apply for Clean Water State Revolving Fund low-interest loan, Small Community Wastewater grant funding assistance, and other funding available at the time of application, for some of the costs associated with complying with this General Order.

Funding applicants may obtain further information regarding current funding opportunities, and Division of Financial Assistance staff contact information at the following website: Financial Assistance Funding - Grants and Loans | California State Water Resources Control Board.
(https://www.waterboards.ca.gov/water_issues/programs/grants_loans/)

Section 13477.6 of the Water Code authorizes the Small Community Grant Fund. The Small Community Grant Fund allows the State Water Board to provide grant funding assistance to small, disadvantaged communities and small severely disadvantaged communities that may not otherwise be able to afford a loan or similar financing for projects to comply with requirements of this General Order. The State Water Board also considers loan forgiveness on a disadvantaged community-specific basis.

For disadvantaged communities' wastewater needs, the State Water Board places priority on the funding of projects that address:

- Public health;
- Violations of waste discharge requirements and National Pollutant Discharge Elimination System (NPDES) permits;
- Providing sewer system service to existing septic tank owners; and
- High priority public health and water quality concerns identified by a Regional Water Board.

3.6. Notification to Interested Parties

On January 31, 2022, the State Water Board notified interested parties and persons of its intent to reissue Sanitary Sewer Systems General Order 2006-0003-DWQ by issuing a draft General Order for a 60-day public comment period. State Water Board staff conducted extensive stakeholder outreach and encouraged public participation in the adoption process for this General Order. On March 15, 2022, the State Water Board held a public meeting to hear and consider oral public comments. The State Water Board considered all public comments prior to adopting this General Order.

THEREFORE, IT IS HEREBY ORDERED, that pursuant to Water Code sections 13263, 13267, and 13383 this General Order supersedes Order 2006-0003-DWQ, Order WQ 2013-0058-EXEC, and any amendments made to these Orders thereafter, except for enforcement purposes and to meet the provisions contained in Division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, the Enrollee shall comply with the requirements in this Order.

4. PROHIBITIONS

4.1 Discharge of Sewage from a Sanitary Sewer System

Any discharge from a sanitary sewer system that has the potential to discharge to surface waters of the State is prohibited unless it is promptly cleaned up and reported as required in this General Order.

4.2. Discharge of Sewage to Waters of the State

Any discharge from a sanitary sewer system, discharged directly or indirectly through a drainage conveyance system or other route, to waters of the State is prohibited.

4.3. Discharge of Sewage Creating a Nuisance

Any discharge from a sanitary sewer system that creates a nuisance or condition of pollution as defined in Water Code section 13050(m) is prohibited.

5. SPECIFICATIONS

5.1. Designation of a Legally Responsible Official

The Enrollee shall designate a Legally Responsible Official that has authority to ensure the enrolled sanitary sewer system(s) complies with this Order, and is authorized to serve as a duly authorized representative. The Legally Responsible Official must have responsibility over management of the Enrollee's entire sanitary sewer system, and must be authorized to make managerial decisions that govern the operation of the sanitary sewer system, including having the explicit or implicit duty of making major capital improvement recommendations to ensure long-term environmental compliance. The Legally Responsible Official must have or have direct authority over individuals that:

- Possess a recognized degree or certificate related to operations and maintenance of sanitary sewer systems, and/or
- Have professional training and experience related to the management of sanitary sewer systems, demonstrated through extensive knowledge, training and experience.

For example, a sewer system superintendent or manager, an operations manager, a public utilities manager or director, or a district engineer may be designated as a Legally Responsible Official.

The Legally Responsible Official shall complete the electronic CIWQS "User Registration" form (https://ciwqs.waterboards.ca.gov/ciwqs/newUser.jsp). A Legally Responsible Official that represents multiple enrolled systems shall complete the electronic CIWQS "User Registration" form for each system.

The Enrollee shall submit any change to its Legally Responsible Official, and/or change in contact information, to the State Water Board within 30 calendar days of the change by emailing ciwqs@waterboards.ca.gov and copying the appropriate Regional Water Board as provided in Attachment F (Regional Water Quality Control Board Contact Information) of this General Order.

5.2. Sewer System Management Plan Development and Implementation

To facilitate adequate local funding and management of its sanitary sewer system(s), the Enrollee shall develop and implement an updated Sewer System Management Plan. The scale and complexity of the Sewer System Management Plan, and specific elements of the Plan, must match the size, scale and complexity of the Enrollee's sanitary sewer system(s). The Sewer System Management Plan must address, at minimum, the required Plan elements in Attachment D (Sewer System Management Plan – Required Elements) of this General Order. To be effective, the Sewer System Management Plan must include procedures for the management, operation, and maintenance of the sanitary sewer system(s). The procedures must: (1) incorporate the

prioritization of system repairs and maintenance to proactively prevent spills, and (2) address the implementation of current standard industry practices through available equipment, technologies, and strategies.

For an existing Enrollee under Order 2006-0003-DWQ that has certified its Continuation of Existing Regulatory Coverage, per section 2.1 (Requirements for Continuation of Existing Regulatory Coverage) of this General Order:

Within six (6) months of the Adoption Date of this General Order:

- The Legally Responsible Official shall upload the Enrollee's existing Sewer System Management Plan to the online CIWQS Sanitary Sewer System Database.

For a new Enrollee:

Within twelve (12) months of the Application for Enrollment approval date:

- The governing entity of the new Enrollee shall approve its Sewer System Management Plan; and
- The Legally Responsible Official shall certify and upload its Sewer System Management Plan to the online CIWQS Sanitary Sewer System Database.

5.3. Certification of Sewer System Management Plan and Plan Updates

The Legally Responsible Official shall certify and upload its Sewer System Management Plan and all subsequent updates to the online CIWQS Sanitary Sewer System Database.

5.4. Sewer System Management Plan Audits

The Enrollee shall conduct an internal audit of its Sewer System Management Plan, and implementation of its Plan, at a minimum frequency of once every three years. The audit must be conducted for the period after the end of the Enrollee's last required audit period. **Within six months after the end of the required 3-year audit period**, the Legally Responsible Official shall submit an audit report into the online CIWQS Sanitary Sewer System Database per the requirements in section 3.10 (Sewer System Management Plan Audit Reporting Requirements) of Attachment E1 of this General Order.

Audit reports submitted to the CIWQS Sanitary Sewer System Database will be viewable only to Water Boards staff.

The internal audit shall be appropriately scaled to the size of the system(s) and the number of spills. The Enrollee's sewer system operators must be involved in completing the audit. At minimum, the audit must:

- Evaluate the implementation and effectiveness of the Enrollee's Sewer System Management Plan in preventing spills;
- Evaluate the Enrollee's compliance with this General Order;
- Identify Sewer System Management Plan deficiencies in addressing ongoing spills and discharges to waters of the State; and

- Identify necessary modifications to the Sewer System Management Plan to correct deficiencies.

The Enrollee shall submit a complete audit report that includes:

- Audit findings and recommended corrective actions;
- A statement that sewer system operators' input on the audit findings has been considered; and
- A proposed schedule for the Enrollee to address the identified deficiencies.

A new Enrollee of this General Order (that did not have a sanitary sewer system enrolled in the previous State Water Board Order 2006-0003-DWQ) shall conduct its first internal Sewer System Management Plan audit for the time period between the date of submittal of its certified Sewer System Management Plan and the third subsequent December 31st date. The audit report must be submitted into the online CIWQS Sanitary Sewer System Database **by July 1 of the following calendar year**.

See the following tables for clarification:

Initial Audit Period and Audit Due Date for New Enrollees

	Audit Period	Audit Due Date
New Enrollee	Certified Sewer System Management Plan Submittal Date through the third subsequent December 31st date	July 1st date after audit period
Example	*Certified Sewer System Management Plan Submittal Date of August 2, 2025* *Audit Period of August 2, 2025 through December 31, 2027*	*July 1, 2028*

Initial Audit Period for Transition from 2-Year Audit Required in Previous Order 2006-0003-DWQ to 3-Year Audit Required in this General Order

	Audit Period	Audit Due Date
An Enrollee previously regulated by Order 2006-003-DWQ	A 3-year period starting from the end of last required 2-year Audit Period	Within six months after end of 3-year Audit Period
Example	*Last required Audit Period start date of August 2, 2021;* *Audit Period of August 2, 2021 through August 1, 2024*	*February 1, 2025*

Three-Year Ongoing Audit Period

	Audit Period	Audit Due Date
Each Enrollee	A 3-year period starting from the end of last required Audit Period	Within six months after end of 3-year Audit Period

5.5. Six-Year Sewer System Management Plan Update

At a minimum, the Enrollee shall update its Sewer System Management Plan every six (6) years after the date of its last Plan Update due date. (For an Enrollee previously regulated by Order 2006-0003-DWQ, the six-year period shall commence on the due date identified in section 3.11 of Attachment E1 (Notification, Monitoring, Reporting and Recordkeeping Requirements) of this Order. The Updated Sewer System Management Plan must include:

- Elements required in Attachment D (Sewer System Management Plan – Required Elements) of this Order;
- Summary of revisions included in the Plan update based on internal audit findings; and
- Other sewer system management-related changes.

The Enrollee's governing entity shall approve the updated Plan. The Legally Responsible Official shall upload and certify the approved updated Plan in the online CIWQS Sanitary Sewer System Database in accordance with section 3.11 (Sewer System Management Plan Reporting Requirements) of Attachment E1 (Notification, Monitoring, Reporting and Recordkeeping Requirements) of this General Order. During the time period in between Plan updates, the Enrollee shall continuously document changes to its Sewer System Management Plan in a change log attached to the Plan.

5.6. System Resilience

The Enrollee shall include and implement system-specific procedures in its Sewer System Management Plan to proactively prioritize: (1) operation and maintenance, (2) condition assessments, and (3) repair and rehabilitation, to address ongoing system resilience, as specified in Attachment D (Sewer System Management Plan – Required Elements) of this General Order.

5.7. Allocation of Resources

The Enrollee shall:

- Establish and maintain a means to manage all necessary revenues and expenditures related to the sanitary sewer system; and
- Allocate the necessary resources to its sewer system management program for:
  - Compliance with this General Order,
  - Full implementation of its updated Sewer System Management Plan,
  - System operation, maintenance, and repair, and
  - Spill responses.

5.8. Designation of Data Submitters

The Legally Responsible Official may designate one or more individuals as a Data Submitter for reporting of spill data. The Legally Responsible Official shall authorize the designation of Data Submitter(s) through the online CIWQS database (https://ciwqs.waterboards.ca.gov) prior to the individuals establishing a CIWQS user account (https://ciwqs.waterboards.ca.gov/ciwqs/newUser.jsp) and entering spill data into the online CIWQS Sanitary Sewer System Database.

The Legally Responsible Official shall submit any change to its Data Submitter(s), and/or change in Data Submitter contact information, to the State Water Board within 30 calendar days of the change, by emailing ciwqs@waterboards.ca.gov and copying the appropriate Regional Water Board as provided in Attachment F (Regional Water Quality Control Board Contact Information) of this General Order.

5.9. Reporting Certification

The Legally Responsible Official shall electronically certify, on the Enrollee's behalf, all applications, reports, the Sewer System Management Plan(s) and corresponding updates, and other information submitted electronically into the online CIWQS Sanitary Sewer System Database, as follows:

"I certify under penalty of perjury under the laws of the State of California that the electronically submitted information was prepared under my direction or supervision. Based on my inquiry of the person(s) directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete, and complies with the Statewide Sanitary Sewer Systems General Order. I am aware that there are significant penalties for submitting false information."

Hardcopy submittals to the State Water Board must be accompanied by the above certification statement.

5.10. System Capacity

The Enrollee shall maintain the system capacity necessary to convey: (1) base flows during dry weather conditions, and (2) wet weather peak flows consistent with designated local historic storms. Design storms must take into account system-specific stormwater contributions via inflow and infiltration, and location-specific depth of groundwater and storm frequencies. The Enrollee shall implement capital improvements to provide adequate hydraulic capacity to:

- Meet or exceed the design criteria as defined in the Enrollee's System Evaluation and Capacity Assurance element of its Sewer System Management Plan; and
- Prevent system capacity-related spills, and adverse impacts to the treatment efficiency of downstream wastewater treatment facilities.

5.11. System Performance Analysis

The Enrollee shall include a running 10-year system performance analysis in its Annual Report. The analysis must include two CIWQS-generated graphs presenting the following information:

Graph 1 – Total Spill Volume per Year:

X axis: A 10-year period which includes the current calendar year and the nine previous calendar years;

Y axis: The total spill volume, per Spill Category, for each calendar year.

Graph 2 – Total Number of Spills per Year:

X axis: A 10-year period which includes the current calendar year and the nine previous calendar years;

Y axis: The total number of spills, per Spill Category, for each calendar year.

The current calendar year is the calendar year covered in the Annual Report.

The Enrollee shall generate the graphs in CIWQS, using the existing data in the online CIWQS Sanitary Sewer System Database at the following graph generation link: (https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/PublicReportSSOServlet?reportAction=criteria&reportId=sso_operation_report).

5.12. Spill Emergency Response Plan and Remedial Actions

For Existing Enrollees (with regulatory coverage under Order 2006-0003-DWQ):

Within six (6) months of the Adoption Date of this General Order, the Enrollee shall update and implement its Spill Emergency Response Plan, per Attachment D, section 6 (Spill Emergency Response Plan) of this General Order.

For New Enrollees:

Within six (6) months of the Application for Enrollment approval date, the Enrollee shall develop and implement a Spill Emergency Response Plan, per Attachment D, section 6 (Spill Emergency Response Plan) of this General Order.

The Enrollee shall certify, in its Annual Report, that its Spill Emergency Response Plan is up to date.

The Spill Emergency Response Plan shall include measures to protect public health and the environment. The Enrollee shall respond to spills from its system(s) in a timely manner that minimizes water quality impacts and nuisance by:

- Immediately stopping the spill and preventing/minimizing a discharge to waters of the State;
- Intercepting sewage flows to prevent/minimize spill volume discharged into waters of the State;
- Thoroughly recovering, cleaning up and disposing of sewage and wash down water; and
- Cleaning publicly accessible areas while preventing toxic discharges to waters of the State.

5.13. Notification, Monitoring, Reporting and Recordkeeping Requirements

The Enrollee shall comply with notification, monitoring, reporting, and recordkeeping requirements in Attachment E1 of this General Order.

5.13.1. Spill Categories

Individual spill notification, monitoring and reporting must be in accordance with the following spill categories:

- **Category 1 Spill**

  A Category 1 spill is a spill of any volume of sewage from or caused by a sanitary sewer system regulated under this General Order that results in a discharge to:

  - A surface water, including a surface water body that contains no flow or volume of water; or
  - A drainage conveyance system that discharges to surface waters when the sewage is not fully captured and returned to the sanitary sewer system or disposed of properly.

    Any spill volume not recovered from a drainage conveyance system is considered a discharge to surface water, unless the drainage conveyance system discharges to a dedicated stormwater infiltration basin or facility.

A spill from an Enrollee-owned and/or operated lateral that discharges to a surface water is a Category 1 spill; the Enrollee shall report all Category 1 spills per section 3.1 of Attachment E1 (Notification, Monitoring, Reporting and Recordkeeping Requirements) of this General Order.

- **Category 2 Spill**

  A Category 2 spill is a spill of 1,000 gallons or greater, from or caused by a sanitary sewer system regulated under this General Order that does not discharge to a surface water.

  A spill of 1,000 gallons or greater that spills out of a lateral and is caused by a failure or blockage in the sanitary sewer system, is a Category 2 spill.

- **Category 3 Spill**

  A Category 3 spill is a spill of equal to or greater than 50 gallons and less than 1,000 gallons, from or caused by a sanitary sewer system regulated under this General Order that does not discharge to a surface water.

  A spill of equal to or greater than 50 gallons and less than 1,000 gallons, that spills out of a lateral and is caused by a failure or blockage in the sanitary sewer system is a Category 3 spill.

- **Category 4 Spill**

  A Category 4 spill is a spill of less than 50 gallons, from or caused by a sanitary sewer system regulated under this General Order that does not discharge to a surface water.

  A spill of less than 50 gallons that spills out of a lateral and is caused by a failure or blockage in the sanitary sewer system is a Category 4 spill.

5.13.2. Annual Report

The Enrollee shall submit an Annual Report (previously termed as Collection System Questionnaire in Order 2006-0003-DWQ) as specified in section 3.9 (Annual Report) of Attachment E1 (Notification, Monitoring, Reporting and Recordkeeping Requirements) of this General Order.

For new Enrollees: Within 30 days of obtaining a CIWQS account, a new Enrollee shall submit its initial Annual Report, as specified in section 3.9 (Annual Report) of Attachment E1 (Notification, Monitoring, Reporting and Recordkeeping Requirements) of this General Order.

5.14. Electronic Sanitary Sewer System Service Area Boundary Map

For continuing enrollees, starting on July 1, 2025, and no later than December 31, 2025:

For new enrollees – no earlier than July 1, 2025, or within 12 months of the Application for Enrollment approval date, whichever date is later:

The Legally Responsible Official shall submit, to the State Water Board, geospatial data detailing the locations of the Enrollee's sanitary sewer system service area boundary, per the required content and specifications in section 3.8 (Electronic Sanitary Sewer System Service Area Boundary Map) of Attachment E1 of this General Order, for each system identified by a WDID number.

An Enrollee of a disadvantaged community that may need assistance developing an electronic map to comply with this requirement, may contact State Water Board staff for assistance at SanitarySewer@waterboards.ca.gov.

5.15. Voluntary Reporting of Spills from Privately-Owned Sewer Laterals and/or Private Sanitary Sewer Systems

Within 24 hours of becoming aware of a spill (as described below) from a private sewer lateral or private sanitary sewer system that is not owned/operated by the Enrollee, the Enrollee is encouraged to report the following observations to the online CIWQS Sanitary Sewer System Database at the following link: https://ciwqs.waterboards.ca.gov:

- A spill equal or greater than 1,000 gallons that discharges (or has a potential to discharge) to a water of the State, or a drainage conveyance system that discharges to waters of the State; **or**
- Any volume of sewage that discharges (or has a potential to discharge) to surface waters.

In the CIWQS module, the Enrollee is encouraged to identify:

- Time of observation;
- Description of general spill location (for example, street name and cross street names);
- Estimated volume of spill;
- If known, general description of spill destination (for example, flowing into drainage channel, flowing directly into a creek, etc.); and
- If known, name of private system owner/operator.

The CIWQS database will make the name and contact information of the entity voluntarily reporting a private spill, accessible to State and Regional Water Board staff only. The CIWQS database will only make information regarding the actual spill, accessible to the public.

5.16. Voluntary Notification of Spills from Privately-Owned Laterals and/or Systems to the California Office of Emergency Services

Upon observing or acquiring knowledge of any of the following from a private sewer lateral or private sanitary sewer system that is not owned/operated by the Enrollee, the Enrollee is encouraged to notify the California Office of Emergency Services (as provided by Health and Safety Code section 5410 et. seq. and Water Code section 13271), or inform the responsible party that State law requires such notification to the Office of Emergency Services by any person that causes or allows a sewage discharge to waters of the State:

- A spill equal to 1,000 gallons or more that discharges (or has a potential to discharge) to waters of the State, or a drainage conveyance system that discharges to waters of the State; or
- A spill of any volume to surface waters.

5.17. Unintended Failure to Report

If an Enrollee becomes aware that they unintentionally failed to submit relevant facts in any report required in this General Order, the Enrollee shall promptly notify Regional Water Board and State Water Board staff. Regional Water Board contact information is included in Attachment F of this Order. State Water Board staff shall be contacted by email at SanitarySewer@waterboards.ca.gov for assistance in formally amending the corresponding report(s) in the online CIWQS Sanitary Sewer System Database.

5.18. Duty to Report to Water Boards

In accordance with Water Code section 13267 and/or section 13383, upon request by the State Water Board Executive Director (or designee) or a Regional Water Board Executive Officer (or designee), the Enrollee shall provide the requested information which the State or Regional Water Board deems necessary to determine compliance with this General Order.

5.19. Operation and Maintenance

To prevent discharges to the environment, the Enrollee shall maintain in good working order, and operate as designed, any facility or treatment and control system designed to contain sewage and convey it to a treatment plant.

6. PROVISIONS

6.1. Enforcement Provisions

The following enforcement provisions are based on existing federal and state regulations, laws and policies, including the federal Clean Water Act, the state Water Code and the State Water Board Enforcement Policy.

6.1.1. Enforceability of Clean Water Act and Water Code Violations

Noncompliance with requirements of this General Order or discharging sewage without enrolling in this General Order constitutes a violation of the Water Code and a potential

violation of the Clean Water Act and is grounds for an enforcement action by the State Water Board or the applicable Regional Water Board. Failure to comply with the notification, monitoring, inspection, entry, reporting, and recordkeeping requirements may subject the Enrollee to administrative civil liabilities of up to $10,000 a day per violation pursuant to Water Code section 13385; up to $1,000 a day per violation pursuant to Water Code section 13268; or referral to the Attorney General for judicial civil enforcement. Discharging waste not in compliance with the requirements of this General Order or the Clean Water Act may subject the Enrollee to administrative civil liabilities up to $10,000 a day per violation and additional liability up to $10 per gallon of discharge not cleaned up after the first 1,000 gallons of discharge; up to $5,000 a day per violation pursuant to Water Code section 13350 or up to $20 per gallon of waste discharged; or referral to the Attorney General for judicial civil enforcement.

6.1.2. Monetary Penalties

The Water Code provides the State and Regional Water Boards the authority to pursue formal enforcement actions, including imposing administrative liability and civil monetary penalties, for non-compliance with the requirements of this General Order and violations of the Clean Water Act.

6.1.3. Falsifying or Failure to Report

The Water Code provides that any person failing or refusing to furnish technical or monitoring program reports, as required under this General Order, or falsifying any information provided in the technical or monitoring reports is subject to administrative liability and civil monetary penalties. Any person who knowingly fails or refuses to furnish technical or monitoring program reports or falsifies any information provided in reports required by this General Order is subject to criminal penalties.

6.1.4. Severability of General Order

The provisions of this General Order are severable; if any provision of this Order, or the application of any provision of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

6.1.5. Indirect Discharges

In the event that a spill enters into a drainage conveyance system, the Enrollee shall take all feasible steps to prevent discharge of sewage into waters of the State by blocking or redirecting the flow in the drainage conveyance system, removing the sewage from the drainage conveyance system, and cleaning the system in a manner that does not inadvertently impact beneficial uses of the receiving water body.

6.1.6. Water Boards' Considerations for Discretionary Enforcement

Consistent with the State Water Board Enforcement Policy, when considering Water Code section 13327 factors, the State Water Board or a Regional Water Board may consider the Enrollee's efforts to contain, control, clean up, and mitigate spills. In assessing the factors, the State Water Board or the applicable Regional Water Board will consider:

- The Enrollee's compliance with this General Order with a focus on compliance with reporting requirements;
- The Enrollee's provision of adequate funding to implement the requirements of this General Order;
- The Enrollee's compliance with providing a complete and updated Sewer System Management Plan;
- The Enrollee's compliance with implementing its Sewer System Management Plan;
- The overall effectiveness of the Enrollee's Sewer System Management Plan with respect to:
    - System management, operation, and maintenance,
    - Adequate treatment facilities, sanitary sewer system facilities, and/or components with an appropriate design capacity, to reasonably prevent spills (e.g. adequately enlarging treatment or collection facilities to accommodate growth, infiltration and inflow, etc.),
    - Preventive maintenance (including cleaning, root grinding, and fats, oils, and grease control) and source control measures,
    - Implementation of backup equipment,
    - Inflow and infiltration prevention and control,
    - Appropriate sanitary sewer system capacity to prevent spills, and
    - The Enrollee's responsiveness to stop and mitigate the impact of the discharge;
- The Enrollee's compliance with identifying the cause of the spill;
- The Enrollee's use of available information and observations to accurately estimate the spill volume and identify the affected or potentially affected receiving waters;
- The Enrollee's thoroughness of cleaning up sewage in drainage conveyance systems after the spill(s);
- The Enrollee's use of water quality and biological monitoring and assessment to determine the short-term and long-term impacts to beneficial uses and the environment;
- The Enrollee's follow up actions to improve system performance;
- The Enrollee's implementation of feasible alternatives to prevent spills, such as:
    - Use of temporary storage or waste retention,
    - Reduction of system inflow and infiltration,
    - Collection and hauling of waste to a treatment facility,
    - Prevention of and/ or containment of spills due to a design storm event identified in the Enrollee's Sewer System Management Plan,

- Implementation of available equipment, technologies, strategies, and recommended industry practices for maintaining and managing sewer systems to prevent spills, and contain and eliminate discharges to waters of the State; and

- The spill duration and factors beyond the reasonable control of the Enrollee causing the event.

6.1.7. Enforcement Discretion Based on Reporting Compliance

Consistent with the State Water Board Enforcement Policy, the State Water Board or a Regional Water Board may consider the Enrollee's efforts to comply with spill reporting requirements when determining compliance with Water Code section 13267 and section 13383. When assessing Water Code section 13227 factors, the State Water Board or the applicable Regional Water Board will consider:

- The Enrollee's diligence to comply with all reporting requirements in this General Order;
- The use of best available information for the Enrollee's reporting of spill start date and start time in which the release of sewage from the sanitary sewer system initiated;
- The Enrollee's reporting of spill end date, and end time to be the date and time in which the release of sewage from the sanitary sewer system was stopped;
- The Enrollee's diligence to accurately estimate and report spill volumes;
- The Enrollee's subsequent verification and/or updates to initial Draft Spill Reports in accordance with this General Order; and
- The Enrollee's timely certification of required spill reports.

Consistent with Water Code section 13267 and section 13383, the State Water Board or a Regional Water Board may require an Enrollee to report the results of a condition assessment of a specified portion of the Enrollee's sanitary sewer system.

6.2. Other Regional Water Board Orders

It is the intent of the State Water Board that sanitary sewer systems be regulated in a manner consistent with federal and state regulations. This Order will not be interpreted or applied:

- In a manner inconsistent with the federal Clean Water Act;
- To authorize a spill or discharge that is illegal under either the Clean Water Act, the Water Code, and/or an applicable Basin Plan prohibition or water quality standard;
- To prohibit a Regional Water Board from issuing an individual National Pollutant Discharge Elimination System (NPDES) permit or individual waste discharge requirements superseding an Enrollee's regulatory coverage under this General Order for a sanitary sewer system authorized under the Clean Water Act or Water Code;

- To supersede any more specific or more stringent waste discharge requirements or enforcement orders issued by a Regional Water Board; or
- To supersede any more specific or more stringent state or federal requirements in existing regulation, an administrative/judicial order, or Consent Decree.

6.3. Sewer System Management Plan Availability

The Enrollee's updated Sewer System Management Plan must be maintained for public inspection at the Enrollee's offices and facilities and must be available to the public through CIWQS and/or on the Enrollee's website, in accordance with section 3.8 (Sewer System Management Plan Reporting Requirements) of Attachment E1 (Notification, Monitoring, Reporting and Recordkeeping Requirements) of this General Order.

6.4. Entry and Inspection

6.4.1. Entry and Availability of Information

The Enrollee shall allow State and Regional Water Board staff, upon presentation of credentials and other documents as may be required by law, to:

- Enter upon the Enrollee's premises where a regulated facility or activity is located or conducted, or where records are kept under the requirements of this General Order;
- Have access to and reproduce any records required to be maintained by this General Order;
- Inspect any facility and/or equipment (including monitoring and control equipment), practices, or operations required in this General Order; and
- Sample or monitor substances or parameters for assuring compliance with this General Order, or as otherwise authorized by the Water Code.

6.4.2. Pre-Inspection Questionnaire

The Enrollee shall provide pre-inspection information to State and Regional Water Board staff through the completion of a Pre-Inspection Questionnaire provided by Water Board staff.

ATTACHMENT A - DEFINITIONS

Annual Report

An Annual Report (previously termed as Collection System Questionnaire in Order 2006-0003-DWQ) is a mandatory report in which the Enrollee provides a calendar-year update of its efforts to prevent spills.

Basin Plan

A Basin Plan is a water quality control plan specific to a Regional Water Quality Control Board (Regional Water Board), that serves as regulations to: (1) define and designate beneficial uses of surface and groundwaters, (2) establish water quality objectives for protection of beneficial uses, and (3) provide implementation measures.

Beneficial Uses

The term “Beneficial Uses” is a Water Code term, defined as the uses of the waters of the State that may be protected against water quality degradation. Examples of beneficial uses include but are not limited to, municipal, domestic, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

California Integrated Water Quality System (CIWQS)

CIWQS is the statewide database that provides for mandatory electronic reporting as required in State and Regional Water Board-issued waste discharge requirements.

Data Submitter

A Data Submitter is an individual designated and authorized by the Enrollee’s Legally Responsible Official to enter spill data into the online CIWQS Sanitary Sewer System Database. A Data Submitter does not have the authority of a Legally Responsible Official to certify reporting entered into the online CIWQS Sanitary Sewer System Database.

Disadvantaged Community

A disadvantaged community is a community with a median household income of less than eighty percent (80%) of the statewide annual median household income.

For the purpose of this General Order, there is no differentiation between a small and large disadvantaged community.

Drainage Conveyance System

A drainage conveyance system is a publicly- or privately-owned separate storm sewer system, including but not limited to drainage canals, channels, pipelines, pump stations, detention basins, infiltration basins/facilities, or other facilities constructed to transport stormwater and non-stormwater flows.

Enrollee

An Enrollee is a public, private, or other non-governmental entity that has obtained approval for regulatory coverage under this General Order, including:

- A state agency, municipality, special district, or other public entity that owns and/or operates one or more sanitary sewer systems:
  - greater than one (1) mile in length (each individual sanitary sewer system);
  - one mile or less in length where the State Water Resources Control Board or a Regional Water Quality Control Board requires regulatory coverage under this Order, or
- A federal agency, private company, or other non-governmental entity that owns and/or operates a sanitary sewer system of any size where the State Water Resources Control Board or a Regional Water Quality Control Board requires regulatory coverage under this Order in response to a history of spills, proximity to surface water, or other factors supporting regulatory coverage.

Environmentally Sensitive Area

An environmentally sensitive area is a designated agricultural and/or wildlife area identified to need special natural landscape protection due to its wildlife or historical value.

Exfiltration

Exfiltration is the underground exiting of sewage from a sanitary sewer system through cracks, offset or separated joints, or failed infrastructure due to corrosion or other factors.

Flood Control Channel

A flood control channel is a channel used to convey stormwater and non-stormwater flows through and from areas for flood management purposes.

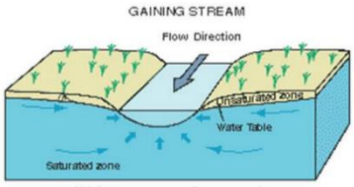
Governing Entity

A governing entity includes but is not limited to the following:

- A publicly elected governing board, council, or commission of a municipal agency;
- A Department or Division director of a federal or state agency that is not governed by a board;
- A governing board or commission of an organization or association; and
- A private system owner/manager that is not governed by a board.

Hydrologically Connected

Two waterbodies are hydrologically connected when one waterbody flows, or has the potential to flow, into the other waterbody. For the purpose of this General Order, groundwater is hydrologically connected to a surface water when the groundwater feeds into the surface water. (The surface waterbody in this example is termed a gaining stream as it gains flow from surrounding groundwater.)



Lateral (including Lower and Upper Lateral)

A lateral is an underground segment of smaller diameter pipe that transports sewage from a customer's building or property (residential, commercial, or industrial) to the Enrollee's main sewer line in a street or easement. Upper and lower lateral boundary definitions are subject to local jurisdictional codes and ordinances, or private system ownership.

A lower lateral is the portion of the lateral located between the sanitary sewer system main, and either the property line, sewer clean out, curb line, established utility easement boundary, or other jurisdictional locations.

An upper lateral is the portion of the lateral from the property line, sewer clean out, curb line, established utility easement boundary, or other jurisdictional locations, to the building or property.

Legally Responsible Official

A Legally Responsible Official is an official representative, designated by the Enrollee, with authority to sign and certify submitted information and documents required by this General Order.

Nuisance

For the purpose of this General Order, a nuisance, as defined in Water Code section 13050(m), is anything that meets all of the following requirements:

- Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property;
- Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and
- Occurs during, or as a result of, the treatment or disposal of wastes.

Private Sewer Lateral

A private sewer lateral is the privately-owned lateral that transports sewage from private property(ies) into a sanitary sewer system.

Private Sanitary Sewer System

A private sanitary sewer system is a sanitary sewer system of any size that is owned and/or operated by a private individual, company, corporation, or organization. A private sanitary sewer system may or may not connect into a publicly owned sanitary sewer system.

Potential to Discharge, Potential Discharge

Potential to Discharge, or Potential Discharge, means any exiting of sewage from a sanitary sewer system which can reasonably be expected to discharge into a water of the State based on the size of the sewage spill, proximity to a drainage conveyance system, and the nature of the surrounding environment.

Receiving Water

A receiving water is a water of the State that receives a discharge of waste.

Resilience

Resilience is the ability to recover from or adjust to adversity or change, and grow from disruptions. Resilience can be built through planning, preparing for, mitigating, and adapting to changing conditions.

Sanitary Sewer System

A sanitary sewer system is a system that is designed to convey sewage, including but not limited to, pipes, manholes, pump stations, siphons, wet wells, diversion structures and/or other pertinent infrastructure, upstream of a wastewater treatment plant headworks, including:

- Laterals owned and/or operated by the Enrollee;
- Satellite sewer systems; and/or
- Temporary conveyance and storage facilities, including but not limited to temporary piping, vaults, construction trenches, wet wells, impoundments, tanks and diversion structures.

For purpose of this Order, sanitary sewer systems include only systems owned and/or operated by the Enrollee.

Satellite Sewer System

A satellite sewer system is a portion of a sanitary sewer system owned or operated by a different owner than the owner of the downstream wastewater treatment facility ultimately treating the sewage.

Sewer System Management Plan

A sewer system management plan is a living document an Enrollee develops and implements to effectively manage its sanitary sewer system(s) in accordance with this General Order.

Sewage

Sewage, and its associated wastewater, is untreated or partially treated domestic, municipal, commercial and/or industrial waste (including sewage sludge), and any mixture of these wastes with inflow or infiltration of stormwater or groundwater, conveyed in a sanitary sewer system.

Spill

A spill is a discharge of sewage from any portion of a sanitary sewer system due to a sanitary sewer system overflow, operational failure, and/or infrastructure failure. Exfiltration of sewage is not considered to be a spill under this General Order if the exfiltrated sewage remains in the subsurface and does not reach a surface water of the State.

Training

Training is in-house or external education and guidance needed that provides the knowledge, skills, and abilities to comply with this General Order.

Wash Down Water

Wash down water is water used to clean a spill area.

Waste

Waste, as defined in Water Code section 13050(d), includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

Waste Discharge Identification Number (WDID)

A waste discharge identification number (WDID) identifies each individual sanitary sewer system enrolled under this General Order. A WDID number is assigned to each enrolled system upon an Enrollee's approved regulatory coverage.

Waters of the State

Waters of the State are surface waters or groundwater within boundaries of the state as defined in Water Code section 13050(e), in which the State and Regional Water Boards have authority to protect beneficial uses. Waters of the State include, but are not limited to, groundwater aquifers, surface waters, saline waters, natural washes and pools, wetlands, sloughs, and estuaries, regardless of flow or whether water exists during dry conditions. Waters of the State include waters of the United States.

Waters of the United States

Waters of the United States are surface waters or waterbodies that are subject to federal jurisdiction in accordance with the Clean Water Act.

Water Quality Objective

A water quality objective is the limit or maximum amount of pollutant, waste constituent or characteristic, or parameter level established in statewide water quality control plans and Regional Water Boards' Basin Plans, for the reasonable protection of beneficial uses of surface waters and groundwater and the prevention of nuisance.

ATTACHMENT B – APPLICATION FOR ENROLLMENT

1. Enrollment Status: (Mark only one item)

☐ New Enrollee

☐ New Enrollee with previous regulatory coverage under Order 2006-0003-DWQ
(that failed to certify continuation of coverage in CIWQS per Order 2022-XXXX-DWQ)
Existing WDID Number: _____

2. Applicant Information:

Legally Responsible Official Submitting Application

First and Last Name: _____

Title: _____

Phone: _____

Email: _____

System Owner/Operator Name: _____

Mailing Address:_____

City, State, Zip:_____

County:_____

Sanitary Sewer System Name: _____

Regional Water Quality Control Board(s): _____

Signature and Date: _____

3. Applicant Type (Check one):

☐ City ☐ County ☐ State ☐ Federal ☐ Special District

☐ Government Combination ☐ Private ☐ Other Non-governmental Entity

4. Wastewater Treatment Plant Receiving Sanitary Sewer System Waste:

Wastewater Treatment Plant Permittee:_____

WDID No.: _____

5. Billing Information

Billing Address: _____

City, State, Zip: _____

Billing Contact Person and Title: _____

Phone and Email Address: _____

6. Application Fee:

The application fee, as required by Water Code section 13260, is based on the daily population served by the sanitary sewer system. See updated Fee Schedule. (https://www.waterboards.ca.gov/resources/fees/water_quality/)

Check one of the following and enter fee amount:

☐ Population Served < 50,000 – Total Fee submitted: $ _____

☐ Population Served ≥ 50,000 – Total Fee submitted: $ _____

Make the fee payment payable to the State Water Resources Control Board and mail the complete application package to:

State Water Resources Control Board, Accounting Office
P. O. Box 1888
Sacramento, CA 95812-1888

Attention: Statewide Sanitary Sewer System Program

7. Application Submittal Certification

I certify under penalty of perjury under the laws of the State of California that to the best of my knowledge and belief, the information in the submitted application package is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Print Name: _____

Title: _____

Signature: _____Date: _____

ATTACHMENT C - NOTICE OF TERMINATION

1. Enrollee Information

Enrollee Name: _____

WDID No:_____

Legally Responsible Official Requesting Termination of Coverage: _____

First and Last Name: _____

Title: _____

Phone: _____

Email: _____

Mailing Address: _____

City, State, Zip: _____

County: _____

Sanitary Sewer System Name(s) or Unique Identifier(s): _____

Regional Water Quality Control Board(s): _____

Signature and Date:_____

2. Basis of Termination

Explanation of termination, including subsequent regulatory coverage and subsequent owner/operator of enrolled sanitary sewer system, as applicable:

_____

_____

_____

_____

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_____

3. Regulatory Coverage Termination Certification

I certify under penalty of perjury under the laws of the State of California that to the best of my knowledge: 1) the sanitary sewer system I officially represent is not required to be regulated under the Statewide Waste Discharge Requirements for Sanitary Sewer Systems Order 2022-XXXX-DWQ, and 2) the information submitted in this Notice of Termination is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I understand that the submittal of this Notice of Termination does not release sanitary sewer system agencies from liability for any violations of the Clean Water Act.

Print Name: _____

Title: _____

Signature: _____Date: _____

For State Water Board Use Only

☐ Approved for Termination ☐ Denied and Returned to Enrollee

Deputy Director of Water Quality Signature: _____

Date: _____Notice of Termination Effective Date: _____

ATTACHMENT D – SEWER SYSTEM MANAGEMENT PLAN – REQUIRED ELEMENTS

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ATTACHMENT D – SEWER SYSTEM MANAGEMENT PLAN – REQUIRED ELEMENTS

A Sewer System Management Plan (Plan) is a living planning document that documents ongoing local sewer system management program activities, procedures, and decision-making – at the scale necessary to address the size and complexity of the subject sanitary sewer system(s). This Plan may incorporate other programs and other plans by reference, to address short-term and long-term system resilience through:

- Proactive planning and decision-making;
- Local government ordinances;
- Updated operations and maintenance activities and procedures;
- Implementation of capital improvements;
- Sufficient local budget to support staff resources, contractors, equipment, and training; and
- Updated training of staff and contractors.

The Enrollee's development, update, and implementation of a Sewer System Management Plan addressing the requirements of this Attachment is an enforceable component of this General Order. As specified in Provision 6.1 (Enforcement Provisions) of this General Order, consistent with the Water Code and the State Water Board Enforcement Policy, the State Water Board or a Regional Water Board may consider the Enrollee's efforts in implementing an effective Sewer System Management Plan to prevent, contain, control, and mitigate spills when considering Water Code section 13327 factors to determine necessary enforcement of this General Order.

This Attachment includes the following required elements that the Enrollee shall address in its Plan and subsequent updates. The Enrollee shall identify any requirement in this Attachment that is not applicable to the Enrollee's sewer system and shall explain in its Plan why the requirement is not applicable.

1. SEWER SYSTEM MANAGEMENT PLAN GOAL AND INTRODUCTION

The goal of the Sewer System Management Plan (Plan) is to provide a plan and schedule to: (1) properly manage, operate, and maintain all parts of the Enrollee's sanitary sewer system(s), (2) reduce and prevent spills, and (3) contain and mitigate spills that do occur.

The Plan must include a narrative Introduction section that discusses the following items:

1.1. Regulatory Context

The Plan Introduction section must provide a general description of the local sewer system management program and discuss Plan implementation and updates.

1.2. Sewer System Management Plan Update Schedule

The Plan Introduction section must include a schedule for the Enrollee to update the Plan, including the schedule for conducting internal audits. The schedule must include milestones for incorporation of activities addressing prevention of sewer spills.

1.3. Sewer System Asset Overview

The Plan Introduction section must provide a description of the Enrollee-owned assets and service area, including but not limited to:

- Location, including county(ies);
- Service area boundary;
- Population and community served;
- System size, including total length in miles, length of gravity mainlines, length of pressurized (force) mains, and number of pump stations and siphons;
- Structures diverting stormwater to the sewer system;
- Data management systems;
- Sewer system ownership and operation responsibilities between Enrollee and private entities for upper and lower sewer laterals;
- Estimated number or percent of residential, commercial, and industrial service connections; and
- Unique service boundary conditions and challenge(s).

Additionally, the Plan Introduction section must provide reference to the Enrollee's up-to-date map of its sanitary sewer system, as required in section 4.1 (Updated Map of Sanitary Sewer System) of this Attachment.

2. ORGANIZATION

The Plan must identify organizational staffing responsible and integral for implementing the local Sewer System Management Plan through an organization chart or similar narrative documentation that includes:

- The name of the Legally Responsible Official as required in section 5.1 (Designation of a Legally Responsible Official) of this General Order;
- The position titles, telephone numbers, and email addresses for management, administrative, and maintenance positions responsible for implementing specific Sewer System Management Plan elements;
- Organizational lines of authority; and
- Chain of communication for reporting spills from receipt of complaint or other information, including the person responsible for reporting spills to the State and Regional Water Boards and other agencies, as applicable. (For example, county

health officer, county environmental health agency, and State Office of Emergency Services.)

3. LEGAL AUTHORITY

The Plan must include copies or an electronic link to the Enrollee's current sewer system use ordinances, service agreements and/or other legally binding procedures to demonstrate the Enrollee possesses the necessary legal authority to:

- Prevent illicit discharges into its sanitary sewer system from inflow and infiltration (I&I); unauthorized stormwater; chemical dumping; unauthorized debris; roots; fats, oils, and grease; and trash, including rags and other debris that may cause blockages;
- Collaborate with storm sewer agencies to coordinate emergency spill responses, ensure access to storm sewer systems during spill events, and prevent unintentional cross connections of sanitary sewer infrastructure to storm sewer infrastructure;
- Require that sewer system components and connections be properly designed and constructed;
- Ensure access for maintenance, inspection, and/or repairs for portions of the service lateral owned and/or operated by the Enrollee;
- Enforce any violation of its sewer ordinances, service agreements, or other legally binding procedures; and
- Obtain easement accessibility agreements for locations requiring sewer system operations and maintenance, as applicable.

4. OPERATION AND MAINTENANCE PROGRAM

The Plan must include the items listed below that are appropriate and applicable to the Enrollee's system.

4.1. Updated Map of Sanitary Sewer System

An up-to-date map(s) of the sanitary sewer system, and procedures for maintaining and providing State and Regional Water Board staff access to the map(s). The map(s) must show gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities within the sewer system service area boundaries.

4.2. Preventive Operation and Maintenance Activities

A scheduling system and a data collection system for preventive operation and maintenance activities conducted by staff and contractors.

The scheduling system must include:

- Inspection and maintenance activities;

- Higher-frequency inspections and maintenance of known problem areas, including areas with tree root problems;
- Regular visual and closed-circuit television (CCTV) inspections of manholes and sewer pipes.

The data collection system must document data from system inspection and maintenance activities, including system areas/components prone to root-intrusion potentially resulting in system backup and/or failure.

4.3. Training

In-house and external training provided on a regular basis for sanitary sewer system operations and maintenance staff and contractors. The training must cover:

- The requirements of this General Order;
- The Enrollee's Spill Emergency Response Plan procedures and practice drills;
- Skilled estimation of spill volume for field operators; and
- Electronic CIWQS reporting procedures for staff submitting data.

4.4. Equipment Inventory

An inventory of sewer system equipment, including the identification of critical replacement and spare parts.

5. DESIGN AND PERFORMANCE PROVISIONS

The Plan must include the following items as appropriate and applicable to the Enrollee's system:

5.1. Updated Design Criteria and Construction Standards and Specifications

Updated design criteria, and construction standards and specifications, for the construction, installation, repair, and rehabilitation of existing and proposed system infrastructure components, including but not limited to pipelines, pump stations, and other system appurtenances. If existing design criteria and construction standards are deficient to address the necessary component-specific hydraulic capacity as specified in section 8 (System Evaluation, Capacity Assurance and Capital Improvements) of this Attachment, the procedures must include component-specific evaluation of the design criteria.

5.2. Procedures and Standards

Procedures, and standards for the inspection and testing of newly constructed, newly installed, repaired, and rehabilitated system pipelines, pumps, and other equipment and appurtenances.

6. SPILL EMERGENCY RESPONSE PLAN

The Plan must include an up to date Spill Emergency Response Plan to ensure prompt detection and response to spills to reduce spill volumes and collect information for prevention of future spills. The Spill Emergency Response Plan must include procedures to:

- Notify primary responders, appropriate local officials, and appropriate regulatory agencies of a spill in a timely manner;
- Notify other potentially affected entities (for example, health agencies, water suppliers, etc.) of spills that potentially affect public health or reach waters of the State;
- Comply with the notification, monitoring and reporting requirements of this General Order, State law and regulations, and applicable Regional Water Board Orders;
- Ensure that appropriate staff and contractors implement the Spill Emergency Response Plan and are appropriately trained;
- Address emergency system operations, traffic control and other necessary response activities;
- Contain a spill and prevent/minimize discharge to waters of the State or any drainage conveyance system;
- Minimize and remediate public health impacts and adverse impacts on beneficial uses of waters of the State;
- Remove sewage from the drainage conveyance system;
- Clean the spill area and drainage conveyance system in a manner that does not inadvertently impact beneficial uses in the receiving waters;
- Implement technologies, practices, equipment, and interagency coordination to expedite spill containment and recovery;
- Implement pre-planned coordination and collaboration with storm drain agencies and other utility agencies/departments prior, during, and after a spill event;
- Conduct post-spill assessments of spill response activities;
- Document and report spill events as required in this General Order; and
- Annually, review and assess effectiveness of the Spill Emergency Response Plan, and update the Plan as needed.

7. SEWER PIPE BLOCKAGE CONTROL PROGRAM

The Sewer System Management Plan must include procedures for the evaluation of the Enrollee's service area to determine whether a sewer pipe blockage control program is needed to control fats, oils, grease, rags and debris. If the Enrollee determines that a program is not needed, the Enrollee shall provide justification in its Plan for why a program is not needed.

The procedures must include, at minimum:

- An implementation plan and schedule for a public education and outreach program that promotes proper disposal of pipe-blocking substances;
- A plan and schedule for the disposal of pipe-blocking substances generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of substances generated within a sanitary sewer system service area;
- The legal authority to prohibit discharges to the system and identify measures to prevent spills and blockages;
- Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, best management practices requirements, recordkeeping and reporting requirements;
- Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the fats, oils, and grease ordinance;
- An identification of sanitary sewer system sections subject to fats, oils, and grease blockages and establishment of a cleaning schedule for each section; and
- Implementation of source control measures for all sources of fats, oils, and grease reaching the sanitary sewer system for each section identified above.

8. SYSTEM EVALUATION, CAPACITY ASSURANCE AND CAPITAL IMPROVEMENTS

The Plan must include procedures and activities for:

- Routine evaluation and assessment of system conditions;
- Capacity assessment and design criteria;
- Prioritization of corrective actions; and
- A capital improvement plan.

8.1 System Evaluation and Condition Assessment

The Plan must include procedures to:

- Evaluate the sanitary sewer system assets utilizing the best practices and technologies available;

- Identify and justify the amount (percentage) of its system for its condition to be assessed each year;
- Prioritize the condition assessment of system areas that:
    - Hold a high level of environmental consequences if vulnerable to collapse, failure, blockage, capacity issues, or other system deficiencies;
    - Are located in or within the vicinity of surface waters, steep terrain, high groundwater elevations, and environmentally sensitive areas;
    - Are within the vicinity of a receiving water with a bacterial-related impairment on the most current Clean Water Act section 303(d) List;
- Assess the system conditions using visual observations, video surveillance and/or other comparable system inspection methods;
- Utilize observations/evidence of system conditions that may contribute to exiting of sewage from the system which can reasonably be expected to discharge into a water of the State;
- Maintain documents and recordkeeping of system evaluation and condition assessment inspections and activities; and
- Identify system assets vulnerable to direct and indirect impacts of climate change, including but not limited to: sea level rise; flooding and/or erosion due to increased storm volumes, frequency, and/or intensity; wildfires; and increased power disruptions.

8.2. Capacity Assessment and Design Criteria

The Plan must include procedures to identify system components that are experiencing or contributing to spills caused by hydraulic deficiency and/or limited capacity, including procedures to identify the appropriate hydraulic capacity of key system elements for:

- Dry-weather peak flow conditions that cause or contributes to spill events;
- The appropriate design storm(s) or wet weather events that causes or contributes to spill events;
- The capacity of key system components; and
- Identify the major sources that contribute to the peak flows associated with sewer spills.

The capacity assessment must consider:

- Data from existing system condition assessments, system inspections, system audits, spill history, and other available information;
- Capacity of flood-prone systems subject to increased infiltration and inflow, under normal local and regional storm conditions;

- Capacity of systems subject to increased infiltration and inflow due to larger and/or higher-intensity storm events as a result of climate change;
- Increases of erosive forces in canyons and streams near underground and above-ground system components due to larger and/or higher-intensity storm events;
- Capacity of major system elements to accommodate dry weather peak flow conditions, and updated design storm and wet weather events; and
- Necessary redundancy in pumping and storage capacities.

8.3. Prioritization of Corrective Action

The findings of the condition assessments and capacity assessments must be used to prioritize corrective actions. Prioritization must consider the severity of the consequences of potential spills.

8.4. Capital Improvement Plan

The capital improvement plan must include the following items:

- Project schedules including completion dates for all portions of the capital improvement program;
- Internal and external project funding sources for each project; and
- Joint coordination between operation and maintenance staff, and engineering staff/consultants during planning, design, and construction of capital improvement projects; and Interagency coordination with other impacted utility agencies.

9. MONITORING, MEASUREMENT AND PROGRAM MODIFICATIONS

The Plan must include an Adaptive Management section that addresses Plan-implementation effectiveness and the steps for necessary Plan improvement, including:

- Maintaining relevant information, including audit findings, to establish and prioritize appropriate Plan activities;
- Monitoring the implementation and measuring the effectiveness of each Plan Element;
- Assessing the success of the preventive operation and maintenance activities;
- Updating Plan procedures and activities, as appropriate, based on results of monitoring and performance evaluations; and
- Identifying and illustrating spill trends, including spill frequency, locations and estimated volumes.

10. INTERNAL AUDITS

The Plan shall include internal audit procedures, appropriate to the size and performance of the system, for the Enrollee to comply with section 5.4 (Sewer System Management Plan Audits) of this General Order.

11. COMMUNICATION PROGRAM

The Plan must include procedures for the Enrollee to communicate with:

- The public for:
  - Spills and discharges resulting in closures of public areas, or that enter a source of drinking water, and
  - The development, implementation, and update of its Plan, including opportunities for public input to Plan implementation and updates.
- Owners/operators of systems that connect into the Enrollee's system, including satellite systems, for:
  - System operation, maintenance, and capital improvement-related activities.

ATTACHMENT E1 – NOTIFICATION, MONITORING, REPORTING AND RECORDKEEPING REQUIREMENTS

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ATTACHMENT E1– NOTIFICATION, MONITORING, REPORTING AND RECORDKEEPING REQUIREMENTS

The Notification Requirements (section 1), Spill-specific Monitoring Requirements (section 2), Reporting Requirements (section 3) and Recordkeeping Requirements (section 4) in this Attachment are pursuant to Water Code section 13267 and section 13383, and are an enforceable component of this General Order. For the purpose of this General Order, the term:

- Notification means the notifying of appropriate parties of a spill event or other activity.
- Spill-specific Monitoring means the gathering of information and data for a specific spill event to be reported or kept as records.
- Reporting means the reporting of information and data into the online California Integrated Water Quality System (CIWQS) Sanitary Sewer System Database.
- Recordkeeping means the maintaining of information and data in an official records storage system.

Failure to comply with the notification, monitoring, reporting and recordkeeping requirements in this General Order may subject the Enrollee to civil liabilities of up to $10,000 a day per violation pursuant to Water Code section 13385; up to $1,000 a day per violation pursuant to Water Code section 13268; or referral to the Attorney General for judicial civil enforcement.

Water Code section 13193 et seq. requires the Regional Water Quality Control Boards (Regional Water Boards) and the State Water Resources Control Board (State Water Board) to collect sanitary sewer spill information for each spill event and make this information available to the public. Sanitary sewer spill information for each spill event includes but is not limited to: Enrollee contact information for each spill event, spill cause, estimated spill volume and factors used for estimation, location, date, time, duration, amount discharged to waters of the State, response and corrective action(s) taken.

1. NOTIFICATION REQUIREMENTS

1.1. Notification of Spills of 1,000 Gallons or Greater to the California Office of Emergency Services

Per Water Code section 13271, for a spill that discharges in or on any waters of the State, or discharges or is deposited where it is, or probably will be, discharged in or on any waters of the State, the Enrollee shall notify the California Office of Emergency Services and obtain a California Office of Emergency Services Control Number as soon as possible **but no later than two (2) hours** after:

- The Enrollee has knowledge of the spill; and
- Notification can be provided without substantially impeding cleanup or other emergency measures.

The notification requirements in this section apply to individual spills of 1,000 gallons or greater, from an Enrollee-owned and/or operated laterals, to a water of the State.

1.2. Spill Notification Information

The Enrollee shall provide the following spill information to the California Office of Emergency Services before receiving a Control Number, as applicable:

- Name and phone number of the person notifying the California Office of Emergency Services;
- Estimated spill volume (gallons);
- Estimated spill rate from the system (gallons per minute);
- Estimated discharge rate (gallons per minute) directly into waters of the State or indirectly into a drainage conveyance system;
- Spill incident description:
  - Brief narrative of the spill event, and
  - Spill incident location (address, city, and zip code) and closest cross streets and/or landmarks;
- Name and phone number of contact person on-scene;
- Date and time the Enrollee was informed of the spill event;
- Name of sanitary sewer system causing the spill;
- Spill cause or suspected cause (if known);
- Amount of spill contained;
- Name of receiving water body receiving or potentially receiving discharge; and
- Description of water body impact and/ or potential impact to beneficial uses.

1.3. Notification of Spill Report Updates

Following the initial notification to the California Office of Emergency Services and until such time that the Enrollee certifies the spill report in the online CIWQS Sanitary Sewer System Database, the Enrollee shall provide updates to the California Office of Emergency Services regarding substantial changes to:

- Estimated spill volume (increase or decrease in gallons initially estimated);
- Estimated discharge volume discharged directly into waters of the State or indirectly into a drainage conveyance system (increase or decrease in gallons initially estimated); and
- Additional impact(s) to the receiving water(s) and beneficial uses.

2. SPILL-SPECIFIC MONITORING REQUIREMENTS

2.1 Spill Location and Spread

The Enrollee shall visually assess the spill location(s) and spread using photography, global positioning system (GPS), and other best available tools. The Enrollee shall document the critical spill locations, including:

- Photography and GPS coordinates for:
  - The system location where spill originated.

    For multiple appearance points of a single spill event, the points closest to the spill origin.
- Photography for:
  - Drainage conveyance system entry locations,
  - The location(s) of discharge into surface waters, as applicable,
  - Extent of spill spread, and
  - The location(s) of clean up.

2.2 Spill Volume Estimation

To assess the approximate spill magnitude and spread, the Enrollee shall estimate the total spill volume using updated volume estimation techniques, calculations, and documentation for electronic reporting. The Enrollee shall update its notification and reporting of estimated spill volume (which includes spill volume recovered) as further information is gathered during and after a spill event.

2.3. Receiving Water Monitoring

2.3.1. Receiving Water Visual Observations

Through visual observations and use of best available spill volume-estimating techniques and field calculation techniques, the Enrollee shall gather and document the following information for spills discharging to surface waters:

- Estimated spill travel time to the receiving water;
- For spills entering a drainage conveyance system, estimated spill travel time from the point of entry into the drainage conveyance system to the point of discharge into the receiving water;
- Estimated spill volume entering the receiving water; and
- Photography of:
  - Waterbody bank erosion,
  - Floating matter,
  - Water surface sheen (potentially from oil and grease),

- Discoloration of receiving water, and
- Impact to the receiving water.

2.3.2. Receiving Water – Water Quality Sampling and Analysis

For sewage spills in which an estimated 50,000 gallons or greater are discharged into a surface water, the Enrollee shall conduct the following water quality sampling no later than **18 hours** after the Enrollee's knowledge of a potential discharge to a surface water:

- Collect one water sample, each day of the duration of the spill, at:
  - The DCS-001 location as described in section 2.3.4 (Receiving Water Sampling Locations) of this Attachment, if sewage discharges to a surface water via a drainage conveyance system; and/or
  - Each of the three receiving water sampling locations in section 2.3.4 (Receiving Water Sampling Locations) of this Attachment;

    If the receiving water has no flow during the duration of the spill, the Enrollee must report "No Sampling Due To No Flow" for its receiving water sampling locations.

The Enrollee shall analyze the collected receiving water samples for the following constituents per section 2.3.3 (Water Quality Analysis Specifications) of this Attachment:

- Ammonia, and
- Appropriate bacterial indicator(s) per the applicable Basin Plan water quality objectives, including one or more of the following, unless directed otherwise by the Regional Water Board:
  - Total Coliform Bacteria
  - Fecal Coliform Bacteria
  - *E-coli*
  - Enterococcus

  Dependent on the receiving water(s), sampling of bacterial indicators shall be sufficient to determine post-spill (after the spill) compliance with the water quality objectives and bacterial standards of the California Ocean Plan or the California Inland Surface Water Enclosed Bays, and Estuaries Plan, including the frequency and/or number of post-spill receiving water samples as may be specified in the applicable plans.

The Enrollee shall collect and analyze additional samples as required by the applicable Regional Water Board Executive Officer or designee.

2.3.3. Water Quality Analysis Specifications

Spill monitoring must be representative of the monitored activity (40 Code of Federal Regulations section 122.41(j)(1)).

Sufficiently Sensitive Methods

Sample analysis must be conducted according to sufficiently sensitive test methods approved under 40 Code of Federal Regulations Part 136 for the sample analysis of pollutants. For the purposes of this General Order, a method is sufficiently sensitive when the minimum level of the analytical method approved under 40 Code of Federal Regulations Part 136 is at or below the receiving water pollutant criteria.

Environmental Laboratory Accreditation Program-Accredited Laboratories

The analysis of water quality samples required per this General Order must be performed by a laboratory that has accreditation pursuant to Article 3 (commencing with section 100825) of Chapter 4 of Part 1 of Division 101 of the Health and Safety Code. (Water Code section 13176(a).) The State Water Board accredits laboratories through its Environmental Laboratory Accreditation Program (ELAP).

2.3.4. Receiving Water Sampling Locations

The Enrollee shall collect receiving water samples at the following locations.

Sampling of Flow in Drainage Conveyance System (DCS) Prior to Discharge

Sampling Location	Sampling Location Description
DCS-001	A point in a drainage conveyance system before the drainage conveyance system flow discharges into a receiving water.

Receiving Surface Water Sampling (RSW)[1]

Sampling Location	Sampling Location Description
RSW-001 Point of Discharge	A point in the receiving water where sewage initially enters the receiving water.
RSW-001U: Upstream of Point of Discharge	A point in the receiving water, upstream of the point of sewage discharge, to capture ambient conditions absent of sewage discharge impacts.

Sampling Location	Sampling Location Description
RSW-001D: Downstream of Point of Discharge	A point in the receiving water, downstream of the point of sewage discharge, where the spill material is fully mixed with the receiving water.

[1] The Enrollee must use its best professional judgment to determine the upstream and downstream distances based on receiving water flow, accessibility to upstream/downstream waterbody banks, and size of visible sewage plume.

2.4. Safety and Access Exceptions

If the Enrollee encounters access restrictions or unsafe conditions that prevents its compliance with spill response requirements or monitoring requirements in this General Order, the Enrollee shall provide documentation of access restrictions and/or safety hazards in the corresponding required report.

3. REPORTING REQUIREMENTS

All reporting required in this General Order must be submitted electronically to the online CIWQS Sanitary Sewer System Database (https://ciwqs.waterboards.ca.gov), unless specified otherwise in this General Order. Electronic reporting may solely be conducted by a Legally Responsible Official or Data Submitter(s) previously designated by the Legally Responsible Official, as required in section 5.8 (Designation of Data Submitters) of this General Order.

The Enrollee shall report any information that is protected by the Homeland Security Act, by email to SanitarySewer@waterboards.ca.gov, with a brief explanation of the protection provided by the Homeland Security Act for the subject report to be protected from unauthorized disclosure and/or public access, and for official Water Board regulatory purposes only.

3.1. Reporting Requirements for Individual Category 1 Spill Reporting

3.1.1. Draft Spill Report for Category 1 Spills

Within three (3) business days of the Enrollee's knowledge of a Category 1 spill, the Enrollee shall submit a Draft Spill Report to the online CIWQS Sanitary Sewer System Database.

The Draft Spill Report must, at minimum, include the following items:

1. Contact information: Name and telephone number of Enrollee contact person to respond to spill-specific questions;
2. Spill location name;
3. Date and time the Enrollee was notified of, or self-discovered, the spill;
4. Operator arrival time;

5. Estimated spill start date and time;
6. Date and time the Enrollee notified the California Office of Emergency Services, and the assigned control number;
7. Description, photographs, and GPS coordinates of the system location where the spill originated;
    - If a single spill event results in multiple appearance points, provide GPS coordinates for the appearance point closest to the failure point and describe each additional appearance point in the spill appearance point explanation field;
8. Estimated total spill volume exiting the system;
9. Description and photographs of the extent of the spill and spill boundaries;
10. Did the spill reach a drainage conveyance system? If Yes:
    - Description of the drainage conveyance system transporting the spill;
    - Photographs of the drainage conveyance system entry location(s);
    - Estimated spill volume fully recovered from the drainage conveyance system;
    - Estimated spill volume remaining within the drainage conveyance system;
11. Description and photographs of all discharge point(s) into the surface water;
12. Estimated spill volume that discharged to surface waters; and
13. Estimated total spill volume recovered.

3.1.2. Certified Spill Report for Category 1 Spills

Within 15 calendar days of the spill end date, the Enrollee shall submit a Certified Spill Report for Category 1 spills, to the online CIWQS Sanitary Sewer System Database. Upon completion of the Certified Spill Report, the online CIWQS Sanitary Sewer System Database will issue a final spill event identification number.

The Certified Spill Report must, at minimum, include the following mandatory information in addition to all information in the Draft Spill Report per section 3.1.1 (Draft Spill Report for Category 1 Spills) above:

1. Description of the spill event destination(s), including GPS coordinates if available, that represent the full spread and reach of the spill;
2. Spill end date and time;
3. Description of how the spill volume estimations were calculated, including at a minimum:
    - The methodology, assumptions and type of data relied upon, such as supervisory control and data acquisition (SCADA) records, flow monitoring or other telemetry information used to estimate the volume of the spill discharged, and the volume of the spill recovered (if any volume of the spill was recovered), and
    - The methodology(ies), assumptions and type of data relied upon for estimations of the spill start time and the spill end time;

4. Spill cause(s) (for example, root intrusion, grease deposition, etc.);
5. System failure location (for example, main, lateral, pump station, etc.);
6. Description of the pipe material, and estimated age of the pipe material, at the failure location;
7. Description of the impact of the spill;
8. Whether or not the spill was associated with a storm event;
9. Description of spill response activities including description of immediate spill containment and cleanup efforts;
10. Description of spill corrective action, including steps planned or taken to reduce, eliminate, and prevent reoccurrence of the spill, and a schedule of major milestones for those steps;
11. Spill response completion date;
12. Detailed narrative of investigation and investigation findings of cause of spill;
13. Reasons for an ongoing investigation (as applicable) and the expected date of completion;
14. Name and type of receiving water body(s);
15. Description of the water body(s), including but not limited to:
    - Observed impacts on aquatic life,
    - Public closure, restricted public access, temporary restricted use, and/or posted health warnings due to spill,
    - Responsible entity for closing/restricting use of water body, and
    - Number of days closed/restricted as a result of the spill.
16. Whether or not the spill was located within 1,000 feet of a municipal surface water intake; and
17. If water quality samples were collected, identify sample locations and the parameters the water quality samples were analyzed for. If no samples were taken, Not Applicable shall be selected.

3.1.3. Spill Technical Report for Individual Category 1 Spill in which 50,000 Gallons or Greater Discharged into a Surface Water

For any spill in which 50,000 gallons or greater discharged into a surface water, **within 45 calendar days** of the spill end date, the Enrollee shall submit a Spill Technical Report to the online CIWQS Sanitary Sewer System Database. The Spill Technical Report, at minimum, must include the following information:

1. Spill causes and circumstances, including at minimum:
    - Complete and detailed explanation of how and when the spill was discovered;

- Photographs illustrating the spill origin, the extent and reach of the spill, drainage conveyance system entrance and exit, receiving water, and post-cleanup site conditions;
- Diagram showing the spill failure point, appearance point(s), the spill flow path, and ultimate destinations;
- Detailed description of the methodology employed, and available data used to calculate the discharge volume and, if applicable, the recovered spill volume;
- Detailed description of the spill cause(s);
- Description of the pipe material, and estimated age of the pipe material, at the failure location;
- Description of the impact of the spill;
- Copy of original field crew records used to document the spill; and
- Historical maintenance records for the failure location.

2. Enrollee's response to the spill:
   - Chronological narrative description of all actions taken by the Enrollee to terminate the spill;
   - Explanation of how the Sewer System Management Plan Spill Emergency Response Plan was implemented to respond to and mitigate the spill; and
   - Final corrective action(s) completed and a schedule for planned corrective actions, including:
     - Local regulatory enforcement action taken against an illicit discharge in response to this spill, as applicable,
     - Identifiable system modifications, and operation and maintenance program modifications needed to prevent repeated spill occurrences, and
     - Necessary modifications to the Emergency Spill Response Plan to incorporate lessons learned in responding to and mitigating the spill.
3. Water Quality Monitoring, including at minimum:
   - Description of all water quality sampling activities conducted;
   - List of pollutant and parameters monitored, sampled and analyzed; as required in section 2.3 (Receiving Water Monitoring) of this Attachment;
   - Laboratory results, including laboratory reports;
   - Detailed location map illustrating all water quality sampling points; and
   - Other regulatory agencies receiving sample results (if applicable).
4. Evaluation of spill impact(s), including a description of short-term and long-term impact(s) to beneficial uses of the surface water.

3.1.4. Amended Certified Spill Reports for Individual Category 1 Spills

The Enrollee shall update or add additional information to a Certified Spill Report within **90 calendar days** of the spill end date by amending the report or by adding an attachment to the Spill Report in the online CIWQS Sanitary Sewer System Database. The Enrollee shall certify the amended report.

After **90 calendar days**, the Enrollee shall contact the State Water Board at SanitarySewer@waterboards.ca.gov to request to amend a Spill Report. The Legally Responsible Official shall submit justification for why the additional information was not reported within the Amended Spill Report due date.

3.2. Reporting Requirements for Individual Category 2 Spill Reporting

3.2.1. Draft Spill Report for Category 2 Spills

Within three (3) business days of the Enrollee's knowledge of a Category 2 spill, the Enrollee shall submit a Draft Spill Report to the online CIWQS Sanitary Sewer System Database.

The Draft Spill Report must, at minimum, include the following items:

1. Contact information: Name and telephone number of Enrollee contact person to respond to spill-specific questions;
2. Spill location name;
3. Date and time the Enrollee was notified of, or self-discovered, the spill;
4. Operator arrival time;
5. Estimated spill start date and time;
6. Date and time the Enrollee notified the California Office of Emergency Services, and the assigned control number;
7. Description, photographs, and GPS coordinates of the system location where the spill originated;

   If a single spill event results in multiple appearance points, provide GPS coordinates for the appearance point closest to the failure point and describe each additional appearance point in the spill appearance point explanation field;
8. Estimated total spill volume exiting the system;
9. Description and photographs of the extent of the spill and spill boundaries;
10. Did the spill reach a drainage conveyance system? If Yes:
    - Description of the drainage conveyance system transporting the spill;
    - Photographs of the drainage conveyance system entry location(s);
    - Estimated spill volume fully recovered from the drainage conveyance system;
    - Estimated spill volume remaining within the drainage conveyance system;

- Estimated spill volume discharged to a groundwater infiltration basin or facility, if applicable; and

11. Estimated total spill volume recovered.

3.2.2. Certified Spill Report for Category 2 Spills

Within 15 calendar days of the spill end date, the Enrollee shall submit a Certified Spill Report for the Category 2 spill, to the online CIWQS Sanitary Sewer System Database (https://ciwqs.waterboards.ca.gov). Upon completion of the Certified Spill Report, the online CIWQS Sanitary Sewer System Database will issue a final spill event identification number.

The Certified Spill Report must, at minimum, include the following mandatory information in addition to all information in the Draft Spill Report per section 3.2.1 (Draft Spill Report for Category 2 Spills) above:

1. Description of the spill event destination(s), including GPS coordinates if available, that represent the full spread and reach of the spill;
2. Spill end date and time;
3. Description of how the spill volume estimations were calculated, including at a minimum:
   - The methodology, assumptions and type of data relied upon, such as supervisory control and data acquisition (SCADA) records, flow monitoring or other telemetry information used to estimate the volume of the spill discharged, and the volume of the spill recovered (if any volume of the spill was recovered), and
   - The methodology(ies), assumptions and type of data relied upon for estimations of the spill start time and the spill end time;
4. Spill cause(s) (for example, root intrusion, grease deposition, etc.);
5. System failure location (for example, main, pump station, etc.);
6. Description of the pipe/infrastructure material, and estimated age of the pipe material, at the failure location;
7. Description of the impact of the spill;
8. Whether or not the spill was associated with a storm event;
9. Description of spill response activities including description of immediate spill containment and cleanup efforts;
10. Description of spill corrective action, including steps planned or taken to reduce, eliminate, and prevent reoccurrence of the spill, and a schedule of major milestones for those steps;
11. Spill response completion date;
12. Detailed narrative of investigation and investigation findings of cause of spill;
13. Reasons for an ongoing investigation (as applicable) and the expected date of completion; and

14. Whether or not the spill was located within 1,000 feet of a municipal surface water intake.

3.2.3. Amended Certified Spill Reports for Individual Category 2 Spills

The Enrollee shall update or add additional information to a Certified Spill Report within **90 calendar days** of the spill end date by amending the report or by adding an attachment to the Spill Report in the online CIWQS Sanitary Sewer System Database. The Enrollee shall certify the amended report.

After **90 calendar days**, the Enrollee shall contact the State Water Board at SanitarySewer@waterboards.ca.gov to request to amend a Spill Report. The Legally Responsible Official shall submit justification for why the additional information was not reported within the Amended Spill Report due date.

3.3. Monthly Certified Spill Reporting for Category 3 Spills

The Enrollee shall report and certify all Category 3 spills to the online CIWQS Sanitary Sewer System Database within 30 calendar days after the end of the month in which the spills occurred. (For example, all Category 3 spills occurring in the month of February shall be reported and certified by March 30th). After the Legally Responsible Official certifies the spills, the online CIWQS Sanitary Sewer System Database will issue a spill event identification number for each spill.

The monthly reporting of all Category 3 spills must include the following items for each spill:

1. Contact information: Name and telephone number of Enrollee contact person to respond to spill-specific questions;
2. Spill location name;
3. Date and time the Enrollee was notified of, or self-discovered, the spill;
4. Operator arrival time;
5. Estimated spill start date and time;
6. Description, photographs, and GPS coordinates where the spill originated:
    - If a single spill event results in multiple appearance points, provide GPS coordinates for the appearance point closest to the failure point and describe each additional appearance point in the spill appearance point explanation field;
7. Estimated total spill volume exiting the system;
8. Description and photographs of the extent of the spill and spill boundaries;
9. Did the spill reach a drainage conveyance system? If Yes:
    - Description of the drainage conveyance system transporting the spill;
    - Photographs of the drainage conveyance system entry locations(s);
    - Estimated spill volume fully recovered from the drainage conveyance system; and

- Estimated spill volume discharged to a groundwater infiltration basis or facility, if applicable.

10. Estimated total spill volume recovered;
11. Description of the spill event destination(s), including GPS coordinates, if available, that represent the full spread and reaches of the spill;
12. Spill end date and time;
13. Description of how the spill volume estimations were calculated, including, at minimum:
    - The methodology and type of data relied upon, including supervisory control and data acquisition (SCADA) records, flow monitoring or other telemetry information used to estimate the volume of the spill discharged, and the volume of the spill recovered (if any volume of the spill was recovered), and
    - The methodology and type of data relied upon to estimate the spill start time, on-going spill rate at time of arrival (if applicable), and the spill end time;
14. Spill cause(s) (for example, root intrusion, grease deposition, etc.);
15. System failure location (for example, main, pump station, etc.);
16. Description of the pipe/infrastructure material, and estimated age of the pipe/infrastructure material, at the failure location;
17. Description of the impact of the spill;
18. Whether or not the spill was associated with a storm event;
19. Description of spill response activities including description of immediate spill containment and cleanup efforts;
20. Description of spill corrective actions, including steps planned or taken to reduce, eliminate, and prevent reoccurrence of the spill, and a schedule of the major milestones for those steps; including, at minimum:
    - Local regulatory enforcement action taken against an illicit discharge in response to this spill, as applicable, and
    - Identifiable system modifications, and operation and maintenance program modifications needed to prevent repeated spill occurrences at the same spill event location, including:
      - Adjusted schedule/method of preventive maintenance,
      - Planned rehabilitation or replacement of sanitary sewer asset,
      - Inspected, repaired asset(s), or replaced defective asset(s),
      - Capital improvements,
      - Documentation verifying immediately implemented system modifications and operating/maintenance modifications,
      - Description of spill response activities,

- Spill response completion date, and
- Ongoing investigation efforts, and expected completion date of investigation to determine the full cause of spill;

21. Detailed narrative of investigation and investigation findings of cause of spill.

3.4. Monthly Certified Spill Reporting for Category 4 Spills

The Enrollee shall report and certify the estimated total spill volume exiting the sanitary sewer system, and the total number of all Category 4 spills to the online CIWQS Sanitary Sewer System Database, within 30 calendar days after the end of the month in which the spills occurred.

3.5. Amended Certified Spill Reports for Category 3 Spills

Within 90 calendar days of the certified Spill Report due date, the Enrollee may update or add additional information to a certified Spill Report by amending the report or by adding an attachment to the Spill Report in the online CIWQS Sanitary Sewer System Database. The Enrollee shall certify the amended report.

After 90 calendar days, the Legally Responsible Official shall contact the State Water Board at SanitarySewer@waterboards.ca.gov to request to amend a certified Spill Report. The Legally Responsible Official shall submit justification for why the additional information was not reported within the 90-day timeframe for amending the certified Spill Report, as provided above.

3.6. Annual Certified Spill Reporting of Category 4 and/or Lateral Spills

For all Category 4 spills and spills from its owned and/or operated laterals that are caused by a failure or blockage in the lateral and that do not discharge to a surface water, the Enrollee shall:

- Maintain records per section 4.4. of this Attachment;

  The Enrollee shall provide records upon request by State Water Board or Regional Water Board staff.

- Annually upload and certify a report, in an appropriate digital format, of all recordkeeping of spills to the online CIWQS Sanitary Sewer System Database, by February 1st after the end of the calendar year in which the spills occurred.

A spill from an Enrollee-owned and/or operated lateral that discharges to a surface water is a Category 1 spill; the Enrollee shall report all Category 1 spills per section 3.1 of Attachment E1 (Notification, Monitoring, Reporting and Recordkeeping Requirements) of this General Order.

3.7. Monthly Certification of "No-Spills" or "Category 4 Spills" and/or "Non-Category 1 Lateral Spills"

If either (1) no spills occur during a calendar month or (2) only Category 4, and/or Enrollee-owned and/or operated lateral spills (that do not discharge to a surface water) occur during a calendar month, the Enrollee shall certify, within 30 calendar days after

the end of each calendar month, either a “No-Spill” certification statement, or a “Category 4 Spills” and/or “Non-Category 1 Lateral Spills” certification statement, in the online CIWQS Sanitary Sewer System Database, certifying that there were either no spills, or Category 4 and/or Non-Category 1 Lateral Spills that will be reported annually (per section 3.6 of this Attachment) for the designated month.

If a spill starts in one calendar month and ends in a subsequent calendar month, and the Enrollee has no further spills of any category, in the subsequent calendar month, the Enrollee shall certify “no-spills” for the subsequent calendar month.

If the Enrollee has no spills from its systems during a calendar month, but the Enrollee voluntarily reported a spill from a private lateral or a private system, the Enrollee shall certify “no-spills” for that calendar month.

If the Enrollees has spills from its owned and/or operated laterals during a calendar month, the Enrollee shall not certify “no spills” for that calendar month.

3.8. Electronic Sanitary Sewer System Service Area Boundary Map

The Legally Responsible Official shall submit, to the State Water Board, an up-to-date electronic spatial map of its sewer system service area boundaries. The map must be in accordance with section 5.14 (Electronic Sanitary Sewer System Service Area Boundary Map) of this General Order and the specification provided on the statewide Sanitary Sewer Systems program website. The map must include the location of wastewater treatment facility(ies) that treats the sewer system waste, if in the same sewer service boundary.

By the Effective Date of this General Order, specifications for the electronic sanitary sewer service area boundary map format will be provided on the statewide Sanitary Sewer Systems Order program website.

3.9. Annual Report (Previously termed as Collection System Questionnaire in General Order 2006-0003-DWQ)

A new Enrollee shall complete and submit its first certified Annual Report into the online CIWQS Sanitary Sewer System Database, **within 30 days of obtaining a CIWQS account**; Subsequent Annual Reports are due by April 1 of each year.

All enrollees shall update their previous year’s Annual Report, **by April 1 of each year after the Effective Date of this General Order,** for each calendar year (January 1 through December 31)**.**

The Annual Report must be entered directly into the online CIWQS Sanitary Sewer System Database. The Enrollee’s Legally Responsible Official shall certify the Annual Report as instructed in CIWQS;

The Annual Report must address, and update as applicable, the following items:

- Population served;

- Updated sewer system service area boundary map, if service area boundary has changed from original map submitted per section 5.14 (Electronic Sanitary Sewer System Service Area Boundary Map) of this General Order;
- Number of system operation and maintenance staff:
  - Entry level (less than two years of experience),
  - Journey level (greater than two years of experience),
  - Supervisory level, and
  - Managerial level;
- Number of operation and maintenance staff certified as a certified collection system operator by the California Water Environmental Association (CWEA), with:
  - Corresponding number of certified collection system operator grade levels (Grade I, II, III, IV, and V);
- System information:
  - Miles of system gravity and force mains,
  - Number of upper and lower service laterals connected to system,
  - Estimated number of upper and lower laterals owned and/or operated by the Enrollee,
  - Portion of laterals that is Enrollee's responsibility,
  - Average age the major components of system infrastructure,
  - Number and age of pump stations, and
  - Estimated total miles of the system pipeline not accessible for maintenance;
- Name and location of the treatment plant(s) receiving sanitary sewer system's waste;
- Name of satellite sewer system tributaries;
- Number of system's gravity sewer above or underground crossings of water bodies throughout system;
- Number of force main (pressurized pipe) above or underground crossings of water bodies throughout system;
- Number of siphons used to convey waste throughout the sewer system;
- Miles of sewer system cleaned;
- Miles of sewer system video inspected, or comparable (i.e., video closed-circuit television or alternative inspection methods);
- System Performance Evaluation as specified in section 5.11 (System Performance Analysis) of this General Order;
- Major spill causes (for example, root intrusion, grease deposition);

- System infrastructure failure points (for example, main, pump station, lateral, etc.);
- Ongoing spill investigations; and
- Actions taken to address system deficiencies.

3.10. Sewer System Management Plan Audit Reporting Requirements

The Enrollee shall submit its Sewer System Management Plan Audit and other pertinent audit information, in accordance with section 5.4 (Sewer System Management Plan Audits) of this General Order, to the online CIWQS Sanitary Sewer System Database **by six (6) months after the end of the 3-year audit period**.

If a Sewer System Management Plan Audit is not conducted as required: the Enrollee shall:

- Update the online CIWQS Sanitary Sewer System Database and select the justification for not conducting the Audit; and
- Notify its corresponding Regional Water Board (see Attachment F (Regional Water Quality Control Board Contact Information)) of the justification for the lapsed requirements.

The Enrollee's reporting of a justification for not conducting a timely Audit does not justify non-compliance with this General Order. The Enrollee shall:

- Submit the late Audit as required in this General Order; and
- Comply with subsequent Audit requirements and due dates corresponding with the original audit cycle.

3.11. Sewer System Management Plan Reporting Requirements

For an Existing Enrollee previously regulated by Order 2006-0003-DWQ: **Within every six (6) years after the required due date of its last Plan Update**, the Legally Responsible Official shall upload and certify a local governing entity-approved Sewer System Management Plan Update to the online CIWQS Sanitary Sewer System Database. If the electronic document format or size capacity prevents the electronic upload of the Plan, the Legally Responsible Official shall report an electronic link to its updated Sewer System Management Plan posted on its own website.

Order 2006-0003-DWQ required each enrollee to develop its initial Sewer System Management Plan per the following schedule, with required Plan updates at a frequency of 5-years thereafter:

Systems serving populations: Greater than 100,000: May 2, 2009

Between 100,000 and 10,000: August 2, 2009

Between 10,000 and 2,500: May 2, 2010

Less than 2,500: August 2, 2010

This Order carries forth the previously-required Plan Update schedule per Order 2006-0003-DWQ. Per the six-year Plan Update frequency required in this Order, the Enrollee shall upload and certify its first Plan Update, to the online CIWQS Sanitary Sewer System Database by the following due dates, with subsequent Plan Updates at the frequency of six years thereafter:

Systems serving populations: Greater than 100,000: May 2, 2025

Between 100,000 and 10,000: August 2, 2025

Between 10,000 and 2,500: May 2, 2026

Less than 2,500: August 2, 2026

For a New Enrollee: **Within twelve (12) months of its Application for Enrollment Approval date**, the Legally Responsible Official of a new Enrollee shall upload and certify a local governing entity-approved Sewer System Management Plan to the online CIWQS Sanitary Sewer System Database. If electronic document format or size capacity prevents the electronic upload of the Plan, the Legally Responsible Official shall report an electronic link to its Sewer System Management Plan posted on its own website. The due date for subsequent 6-year Plan updates, is six (6) years from the submittal due date of the new Enrollee's first Sewer System Management Plan.

4. RECORDKEEPING REQUIREMENTS

The Enrollee shall maintain records to document compliance with the provisions of this General Order, and previous General Order 2006-0003-DWQ as applicable, for each sanitary sewer system owned, including any required records generated by an Enrollee's contractor(s).

4.1. Recordkeeping Time Period

The Enrollee shall maintain records of documents required in this Attachment, including records collected for compliance with this General Order, and records collected in accordance with previous General Order 2006-0003-DWQ, for five (5) years.

4.2. Availability of Documents

The Enrollee shall make the records required in this General Order readily available, either electronic or hard copies, for review by Water Board staff during onsite inspections or through an information request.

4.3. Spill Reports

The Enrollee shall maintain records for each of the following spill-related events and activities:

- Spill event complaint, including but not limited to records documenting how the Enrollee responded to notifications of spills. Each complaint record must, at a minimum, include the following information:
    - Date, time, and method of notification,

- Date and time the complainant first noticed the spill, if available,
- Narrative description of the complaint, including any information the caller provided regarding whether the spill has reached surface waters or a drainage conveyance system, if available,
- Complainant's contact information, if available, and
- Final resolution of the complaint;

- Records documenting the steps and/or remedial action(s) undertaken by the Enrollee, using all available information, to comply with this General Order, and previous General Order 2006-0003-DWQ as applicable;
- Records documenting how estimate(s) of volume(s) and, if applicable, volume(s) of spill recovered were calculated;
- All California Office of Emergency Services notification records, as applicable; and
- Records, in accordance with the Monitoring Requirements in this Attachment.

4.4. Recordkeeping of Category 4 Spills and Non-Category 1 Lateral Spills

An Enrollee must maintain the following records for each individual Category 4 spill and for each individual non-Category 1 Enrollee-owned and/or operated lateral spill, and report in accordance to section 3.6 (Annual Certified Spill Reporting of Category 4 and/or Lateral Spills) of this Attachment.

Recordkeeping of Individual Category 4 Spill Information:

1. Contact information: Name and telephone number of Enrollee contact person to respond to spill-specific questions;
2. Spill location name;
3. Description and GPS coordinates for the system location where the spill originated;
4. Did the spill reach a drainage conveyance system? If Yes:
   - Description of drainage conveyance system location,
   - Estimated spill volume fully recovered within the drainage conveyance system, and
   - Estimated spill volume remaining within the drainage conveyance system;
5. Estimated total spill volume exiting the sanitary sewer system;
6. Spill date and start time;
7. Spill cause(s) (for example, root intrusion, grease deposition, etc.);
8. System failure location (for example, main, pump station, etc.);
9. Description of spill response activities including description of immediate spill containment and cleanup efforts;
10. Description of how the volume estimation was calculated, including, at minimum:

- The methodology and type of data relied upon, including supervisory control and data acquisition (SCADA) records, flow monitoring or other telemetry information used to estimate the volume of the spill discharged, and the volume of the spill recovered (if any volume of the spill was recovered), and
- The methodology and type of data relied upon to estimate the spill start time, on-going spill rate at time of arrival (if applicable), and the spill end time;

11. Description of implemented system modifications and operating/maintenance modifications.

Recordkeeping of Individual Lateral Spill Information:

1. Date and time the Enrollee was notified of, or self-discovered, the spill;
2. Location of individual spill;
3. Estimated individual spill volume;
4. Spill cause(s) (for example, root intrusion, grease deposition, etc.); and
5. Description of how the volume estimations were calculated.

Total Annual Spill Information:

1. Estimated total annual spill volume;
2. Description of spill corrective actions, including at minimum:
   - Local regulatory enforcement action taken against the sewer lateral owner in response to a spill, as applicable, and
   - System operation, maintenance and program modifications implemented to prevent repeated spill occurrences at the same spill location.

4.5. Sewer System Telemetry Records

The Enrollee shall maintain the following sewer system telemetry records if used to document compliance with this General Order, and previous General Order 2006-0003-DWQ as applicable, including spill volume estimates:

- Supervisory control and data acquisition (SCADA) system(s);
- Alarm system(s);
- Flow monitoring device(s) or other instrument(s) used to estimate sewage flow rates, and/or volumes;
- Computerized maintenance management system records; and
- Asset management-related records.

4.6. Sewer System Management Plan Implementation Records

The Enrollee shall maintain records documenting the Enrollee's implementation of its Sewer System Management Plan, including documents supporting its Sewer System Management Plan audits, corrections, modifications, and updates to the Sewer System Management Plan.

4.7. Audit Records

The Enrollee shall maintain, at minimum, the following records pertaining to its Sewer System Management Plan audits, and other internal audits:

- Completed audit documents and findings;
- Name and contact information of staff and/or consultants that conducted or involved in the audit; and
- Follow-up actions based on audit findings.

4.8. Equipment Records

The Enrollee shall maintain a log of all owned and leased sewer system cleaning, operational, maintenance, construction, and rehabilitation equipment.

4.9. Work Orders

The Enrollee shall maintain record of work orders for operations and maintenance projects.

ATTACHMENT E2 – SUMMARY OF NOTIFICATION, MONITORING AND REPORTING REQUIREMENTS

This Attachment provides a summary of notification, monitoring and reporting requirements, by spill category, and for Enrollee-owned and/or operated laterals as required in Attachment E1 of this General Order, for quick reference purposes only.

Table E2-1

Spill Category 1: Spills to Surface Waters

Spill Requirement	Due	Method
Notification	**Within two (2) hours** of the Enrollee's knowledge of a Category 1 spill of 1,000 gallons or greater, discharging or threatening to discharge to surface waters: Notify the California Office of Emergency Services and obtain a notification control number.	California Office of Emergency Services at: (800) 852-7550 (Section 1 of Attachment E1)
Monitoring	• Conduct spill-specific monitoring; • Conduct water quality sampling of the receiving water within **18 hours** of initial knowledge of spill of 50,000 gallons or greater to surface waters.	(Section 2 of Attachment E1)
Reporting	• Submit Draft Spill Report **within three (3) business days** of the Enrollee's knowledge of the spill; • Submit Certified Spill Report **within 15 calendar days** of the spill end date; • Submit Technical Report **within 45 calendar days** after the spill end date for a Category 1 spill in which **50,000 gallons or greater** discharged to surface waters; and • Submit Amended Spill Report **within 90 calendar days** after the spill end date.	(Section 3.1 of Attachment E1)

Table E2-2
Spill Category 2: **Spills of 1,000 Gallons or Greater That Do Not Discharge to Surface Waters**

Spill Requirements	Due	Method
Notification	**Within two (2) hours** of the Enrollee's knowledge of a Category 2 spill of 1,000 gallons or greater, discharging or threatening to discharge to waters of the State: Notify California Office of Emergency Services and obtain a notification control number.	California Office of Emergency Services at: (800) 852-7550 (Section 1 of Attachment E1)
Monitoring	Conduct spill-specific monitoring.	(Section 2 of Attachment E1)
Reporting	• Submit Draft Spill Report **within three (3) business days** of the Enrollee's knowledge of the spill; • Submit Certified Spill Report **within 15 calendar days** of the spill end date; and • Submit Amended Spill Report **within 90 calendar days** after the spill end date.	(Section 3.2 of Attachment E1)

Table E2-3
Spill Category 3: Spills of Equal or Greater than 50 Gallons and Less than 1,000 Gallons That Does Not Discharge to Surface Waters

Spill Requirements	Due	Method
Notification	Not Applicable	Not Applicable
Monitoring	Conduct spill-specific monitoring.	(Section 2 of Attachment E1)
Reporting	• Submit monthly Certified Spill Report to the online CIWQS Sanitary Sewer System Database within **30 calendars days** after the end of the month in which the spills occur; and • Submit Amended Spill Reports **within 90 calendar days** after the Certified Spill Report due date.	(Section 3.3 and 3.5 of Attachment E1)

Table E2-4
Spill Category 4: Spills Less Than 50 Gallons That Do Not Discharge to Surface Waters

Spill Requirements	Due	Method
Notification	Not Applicable	Not Applicable
Monitoring	Conduct spill-specific monitoring.	(Section 2 of Attachment E1)
Reporting	• If, during any calendar month, Category 4 spills occur, certify monthly, the estimated total spill volume exiting the sanitary sewer system, and the total number of all Category 4 spills into the online CIWQS Sanitary Sewer System Database, within 30 days after the end of the calendar month in which the spills occurred. • Upload and certify a report, in an acceptable digital format, of all Category 4 spills to the online CIWQS Sanitary Sewer System Database, by February 1st after the end of the calendar year in which the spills occur.	(Section 3.4, 3.6, 3.7 and 4.4 of Attachment E1)

Table E2-5
Enrollee Owned and/or Operated Lateral Spills That Do Not Discharge to Surface Waters

Spill Requirements	Due	Method
Notification	**Within two (2) hours** of the Enrollee's knowledge of a spill of 1,000 gallons or greater, from an enrollee-owned and/or operated lateral, discharging or threatening to discharge to waters of the State: Notify California Office of Emergency Services and obtain a notification control number. Not applicable to a spill of less than 1,000 gallons.	California Office of Emergency Services at: (800) 852-7550 (Section 1 of Attachment E1)
Monitoring	Conduct visual monitoring.	(Section 2 of Attachment E1)
Reporting	• Upload and certify a report, in an acceptable digital format, of all lateral spills (that do not discharge to a surface water) to the online CIWQS Sanitary Sewer System Database, by February 1st after the end of the calendar year in which the spills occur. • Report a lateral spill of any volume that discharges to a surface water as a Category 1 spill.	(Sections 3.6, 3.7 and 4.4 of Attachment E1)

ATTACHMENT F – REGIONAL WATER QUALITY CONTROL BOARD CONTACT INFORMATION

This Attachment provides a map, list of counties, and contact information to assist the Enrollee in identifying the corresponding Regional Water Quality Control Board office, for all Regional Water Board notification requirements in this General Order.



Region 1 -- North Coast Regional Water Quality Control Board:
Del Norte, Glenn, Humboldt, Lake, Marin, Mendocino, Modoc, Siskiyou, Sonoma, and Trinity counties.

RB1SpillReporting@waterboards.ca.gov or (707) 576-2220

Region 2 -- San Francisco Bay Regional Water Quality Control Board:
Alameda, Contra Costa, San Francisco, Santa Clara (Northern most part of Morgan Hill), San Mateo, Marin, Sonoma, Napa, Solano counties.

RB2SpillReports@waterboards.ca.gov or (510) 622-2369

Region 3 -- Central Coast Regional Water Quality Control Board:
Santa Clara (most of Morgan Hill), San Mateo (Southern portion), Santa Cruz, San Benito, Monterey, Kern (small portions), San Luis Obispo, Santa Barbara, Ventura (Northern portion) counties.

CentralCoast@waterboards.ca.gov or (805) 549-3147

Region 4 -- Los Angeles Regional Water Quality Control Board:
Los Angeles, Ventura counties (small portions of Kern and Santa Barbara counties).

rb4-ssswdr@waterboards.ca.gov or (213) 576-6600

Region 5 -- Central Valley Regional Water Quality Control Board:

Rancho Cordova (Sacramento) Office: Colusa, Lake, Sutter, Yuba, Sierra, Nevada, Placer, Yolo, Napa, (North East), Solano (West), Sacramento, El Dorado, Amador, Calaveras, San Joaquin, Contra Costa (East), Stanislaus, Tuolumne counties.

RB5sSpillReporting@waterboards.ca.gov or (916) 464-3291

Fresno Office: Fresno, Kern, Kings, Madera, Mariposa, Merced, and Tulare counties, and small portions of San Benito and San Luis Obispo counties.

RB5fSpillReporting@waterboards.ca.gov or (559) 445-5116

Redding Office: Butte, Glen, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Tehama counties.

RB5rSpillReporting@waterboards.ca.gov or (530) 224-4845

Region 6 -- Lahontan Regional Water Quality Control Board:

Lake Tahoe Office: Alpine, Modoc (East), Lassen (East side and Eagle Lake), Sierra, Nevada, Placer, El Dorado counties.

RB6sSpillReporting@waterboards.ca.gov or (530) 542-5400

Victorville Office: Mono, Inyo, Kern (East), San Bernardino, Los Angeles (North East corner) counties.

RB6vSpillReporting@waterboards.ca.gov or (760) 241-6583

Region 7 -- Colorado River Basin Regional Water Quality Control Board:

Imperial county and portions of San Bernardino, Riverside, San Diego counties.

RB7SpillReporting@waterboards.ca.gov or (760) 346-7491

Region 8 -- Santa Ana Regional Water Quality Control Board:

Orange, Riverside, San Bernardino counties.

RB8SpillReporting@waterboards.ca.gov or (951) 782-4130

Region 9 -- San Diego Regional Water Quality Control Board:

San Diego county and portions of Orange and Riverside counties.

RB9Spill_Report@waterboards.ca.gov or (619) 516-1990

End of Order 2022-0103-DWQ

Chapter 13.08

SEWER SERVICE SYSTEM

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These wastewater discharge regulations set uniform requirements for discharges of domestic and industrial waste and drainage water into the city sewerage system to enable the city to comply with the administrative provisions of the Clean Water Grant Regulations, water quality requirements set by the Regional Water Quality Control Board and the applicable effluent limitations, national standards of performance, toxic and pretreatment effluent standards, and any other discharge criteria which are required or authorized by state and federal law, and to derive the maximum public benefit by regulating the quality and quantity of wastewater discharged into those systems. (Ord. 2006-02 (part), 2006: Prior code § 4100)

13.08.020 Rules and regulations.

The following rules and regulations concerning sewer construction, disposal of sewage and drainage of buildings, and connection to and use of the sewerage system of the city are adopted, and all work in respect thereto shall be performed as herein required and not otherwise. (Ord. 2006-02 (part), 2006: Prior code § 4101)

13.08.030 Short title.

This chapter shall be known as the "Wastewater Ordinance of the City of Visalia." (Ord. 2006-02 (part), 2006: Prior code § 4103)

Article 2. Definitions

13.08.040 Definitions.

As used in this chapter, the following terms are defined in this section:

"Acceptable private sewerage disposal system" means adequate earth-covered underground septic tanks, cesspools, leach lines and wells, and/or combinations thereof; not including privies, privy vaults, open cesspools, or similar devices.

"Act" or "the act" means the Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. 1251, et. seq.

"Applicant" means the person making application for a permit for a sewer or plumbing installation, who shall be the owner of premises to be served by the sewer or plumbing installation for which a permit or waiver is requested, or his authorized agent.

"Authorized representative" means:

1. If the discharger is a corporation, an authorized representative shall mean:

a. President of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation;

b. The manager of one or more manufacturing, production, or operational facilities employing more than two hundred fifty (250) persons or having gross annual sales or expenditures exceeding twenty-five million dollars ($25,000,000.00), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

2. If the discharger is a partnership, or sole proprietorship, an authorized representative shall mean a general partner or proprietor, respectively;

3. If the discharger is a federal, state or local governmental facility, an authorized representative shall mean a director or highest official appointed or designated to oversee the operation and performance of the activities of the governmental facility, or his/her designee;

4. The individuals described in this section may designate another authorized representative if the authorization is in writing, the authorization specifies the individual or position responsible for the overall operation of the facility from which the discharge originates or having overall responsibility for environmental matters for the company, and the written authorization has been submitted to the city.

"Available sewer" means a community sewer within two hundred (200) feet of the property line of any premises.

"Beneficial uses" means uses of the waters of the state that may be protected against quality degradation including, but not necessarily limited to, domestic, municipal, agricultural and industrial supply, power generation, recreation, aesthetic enjoyment, and the preservation and enhancement of fish, wildlife and other aquatic resources or reserves, and other uses, both tangible or intangible as specified by federal and state law.

"Biochemical oxygen demand (BOD)" means the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five days at twenty (20) degrees C, expressed in milligrams per liter.

"Building" means a structure used for any purpose which contains a fixture, plumbing system or sanitary facility of any type.

"Building drain" means that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the side sewer.

"Categorical pretreatment standards" means National Categorical Pretreatment Standard(s). Any regulation containing pollutant discharge limits promulgated by the EPA in accordance with Section 307(b) and (c) of the Act which applies to a specific category of industrial discharger.

"Cesspool" means an excavation in the ground which receives the discharge of a drainage system, or part thereof, so designed and constructed as to retain the organic matter and solids discharging therein, but permitting the liquids to seep through the bottom and sides.

"Chlorine demand" means the amount of chlorine required to produce a free chlorine residual of 0.1 mg/l after a contact time of fifteen (15) minutes as measured by the Iodometric Method on a sample at a temperature of twenty (20) degrees C in accordance with the procedures in standard methods.

"City" means the city of Visalia, California.

"City council" means the city council of the city.

"City engineer" means the city engineer of the city or the engineer's authorized deputy, agent or representative.

"City manager" means the city manager of the city or the manager's authorized deputy, agent or representative.

"Clean Water Grant Program Regulations" means the latest regulations of the California Code of Regulations, Title 23, Chapter 3, Subchapter 7, and any subsequent amendments thereto.

"Commercial discharger" means any discharger not specifically defined as a residential, industrial, or institutional discharger.

"Commercial garbage grinder" means a mechanical unit for pulverizing solid wastes produced by commercial dischargers.

"Community sewer" means a sewer owned and operated by the city or other public agency tributary to a treatment facility operated by the city.

"Compatible pollutant" means biochemical oxygen demand, suspended solids, settleable solids, pH and fecal coliform bacteria; plus other pollutants that the city's treatment facilities are designed to accept and/or remove. Compatible pollutants are noncompatible when discharged in quantities that have an adverse effect on the city's system or NPDES permit compliance.

"Connection" means the physical attachment of a building, premises, fixture, plumbing system, trap, pretreatment facility, or any other facility discharging wastewater to a community sewer.

"Connection fee" means a one time charge for new connections to the collection system. The fee is normally paid at the time of issuance of a building permit.

"Contamination" means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. Contamination shall include any equivalent effect resulting from the disposal of wastewater, whether or not waters of the state are affected.

"Contractor" means an individual, firm, corporation, partnership or association duly licensed by the state of California to perform the type of work to be done under a permit.

"County" means the county of Tulare, California.

"Developed lot" means a parcel of ground of record, of less than five acres, created by subdivision or lot split, and occupied by a residential, commercial, institutional or industrial structure.

"Director" means the director(s) of the department(s) of the city or such other person as may be designated by the director to perform the services or make the determinations permitted or required in this chapter to be made by the director.

“Discharger” means any person who discharges or causes the discharge of wastewater to a community sewer system or directly to the POTW. Discharger shall mean the same as user.

"Dissolved solids" means the solid matter in solution in wastewater, as determined by evaporation of a sample from which all suspended matter has been removed by filtration, in accordance with the procedures in standard methods.

"Domestic sewage" means the waterborne wastes derived from the ordinary living processes and of such character as to permit satisfactory disposal, without special treatment, into the community sewer.

"Dwelling unit" means a building or portion of a building arranged, intended or designed to be occupied by not more than one family and having facilities for sleeping, eating, cooking and sanitary purposes.

"Effluent" means wastewater or other liquid, partially or completely treated, or in its natural state, or any portion thereof flowing out of a reservoir, basin, treatment plant or industrial treatment plant.

"Fixture" means lavatory, tub, shower, water closet, garbage disposal or other facility connected by a drain to the sewer.

"Fixture unit" means the flow producing effluent of different fixtures on the collection system as defined by the most recent edition adopted by the city of the Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials, a nonprofit organization.

"Garbage" means putrescible animal, fish, fowl, fruit, or vegetable refuse or any part thereof resulting from the preparation, storage, handling, processing or consumption of food.

"Grease" means any material which is extractable from an acidified sample of a waste by hexane or other designated solvent and as determined by the appropriate methods and procedures approved by the Environmental Protection Agency, and identified in 40 CFR Part 136. Grease includes fats and oils.

"Grease interceptor" means a pretreatment device designed and installed to separate fats, oils and grease from wastewater.

“Holding tank waste” means any waste from holding tanks such as chemical toilets, campers, trailers, septic tanks or other such tanks intended to temporarily contain septage wastes.

"Incompatible pollutant" means any pollutant which is not a compatible pollutant as defined in this section.

"Indirect discharge" means the introduction of pollutants into the city's wastewater collection or treatment systems from any nondomestic source regulated under the provisions of the Act, Section 307, as amended, or as otherwise identified by the city.

“Industrial user” means a source of indirect discharge.

"Industrial waste" means the waterborne waste and wastewater from any producing, manufacturing or processing operation of whatever nature, including institutional and commercial operations, where water is used for laundering, vehicle cleaning, or the removal of significant quantities of wastes of nonhuman origin, as distinct from sanitary sewage.

"Industrial waste inspector" means the representative of the city specifically authorized as industrial waste inspector.

"Institutional discharger" means any public or nonprofit school, church, hospital, lodge, club, fire department, library, memorial building or other public or nonprofit activity which discharges only sanitary sewage to city's system.

“Interference” means the inhibition or disruption of the sewer system, treatment process or operations of the wastewater treatment plant which contributes to the violation of city's NPDES permit caused by a discharge, either alone or in conjunction with discharge or discharges from other sources. The term includes prevention of sewage sludge use or disposal by the city in accordance with Section 405 of the Act (33 U.S.C. 1345) or any criteria, guidelines, or regulations developed pursuant to the Solid Waste Disposal Act (SWDA), the Clean Air Act, the Toxic Substances Control Act, the Marine Protection, Research, and Sanctuaries Act, or more stringent state criteria (including those contained in any state sludge management plan prepared pursuant to Title IV of SWDA) applicable to the method of disposal or use employed by the city.

"Mass emission rate" means the weight of material discharged to the sewer system during a given time interval. Unless otherwise specified, the mass emission rate shall mean pounds per day of a particular constituent or combination of constituents.

"Natural outlet" means any outlet into a water course, pond, ditch, lake or other body of surface or groundwater.

"New source" means:

1. Any building, structure, facility or installation from which there is or may be a discharge of pollutants, the construction of which commenced after the publication of proposed pretreatment standards under Section 307(c) of the Act which will be applicable to such source if standards are thereafter promulgated in accordance with that section, provided that:

a. The building, structure, facility or installation is constructed at a site at which no other source is located; or

b. The building, structure, facility or installation totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or

c. The production or wastewater generating process of the building, structure, facility or installation are substantially independent of an existing source at the same site. In determining whether these are substantially independent, factors such as the extent to which the new facility is integrated with the existing plant, and the extent to which the new facility is engaged in the same general type of activity as the existing source, will be considered.

2. Construction on a site at which an existing source is located results in a modification rather than a new source if the construction does not create a new building, structure, facility or installation meeting the criteria of subsections (1)(b) or (1)(c) of this definition, but otherwise alters, replaces, or adds to existing process or production equipment.

3. Construction of a new source is determined to have commenced if the owner or operator has:

a. Begun, or caused to being as part of a continuous on-site construction program:

i. Any placement, assembly, or installation of facilities or equipment; or

ii. Significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which is necessary for the placement, assembly, or installation of new source facilities or equipment; or

b. Entered into a binding contractual obligation for the purchase of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase, or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering and design studies do not constitute a contractual obligation under this definition.

"Nuisance" means anything which is injurious to health or is offensive to the senses or an obstruction to the free use of property so as to interfere with a person's comfort or enjoyment of life or property, or which affects at the same time an entire community or neighborhood or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

"Outside sewer" means a sanitary sewer, beyond the limits of the city, not subject to control or jurisdiction of the city.

“POTW (Publicly Operated Treatment Works)” means the city sewage treatment facilities, known also as the sewage treatment plant, the water conservation plant, or the wastewater treatment plant.

“Pass through” means the discharge of pollutants through the city's treatment system into navigable waters in quantities or concentrations which alone or in conjunction with a discharge or discharges from other sources is a cause of a violation of any requirement of the city's NPDES permit, including an increase in magnitude or duration of the violation.

"Peak flow rate" means the annually determined highest flow rate of sewage or industrial waste discharged to a public sewer over a period of at least fifteen (15) minutes at any time during the preceding twelve (12) month period.

"Permit" means any written authorization to install or construct sewers or to discharge to the city sewerage system required pursuant to this or any other regulation of the city.

"Person" means any individual, firm, company, partnership, association, organization, the United States of America, the state of California, a political subdivision, governmental agency or other public or municipal corporation.

"pH" means the logarithm of the reciprocal of the hydrogen-ion activity in moles per liter of solution as determined by standard methods and procedures approved by the Environmental Protection Agency, and identified in 40 CFR Part 136.

"Plumbing fixtures" means receptacles that receive liquid, water, or wastewater and discharge them into a drainage system.

"Plumbing system" means the distributing pipes for the water supply; the fixtures and fixture traps; the soil, waste and vent pipes; the building drain and building sewer, and the stormwater drainage pipes; with their devices, appurtenances, and connections within and adjacent to the building.

"Pollution" means an alteration of the quality of the receiving waters of the state by waste to a degree which unreasonably affects such waters for beneficial use or for facilities which serve such beneficial uses. Pollution may include, but not be limited to, contamination.

"Premises" means any lot, place or parcel of land or any building, structure, mobile home, or any part of a building, structure, or mobile home on any lot, place or parcel of land.

1. "Residential premises" means all premises used exclusively for residential purposes except for boarding houses, dormitories, motels, hotels, hospitals, convalescent homes, or other premises used primarily as a temporary place of residence, and discharging only sanitary sewage.

2. "Nonresidential premises" means all premises other than residential premises.

"Pretreatment facility" means any works or device for the treatment or flow limitation of sewage or industrial waste, prior to discharge into a public sewer.

“Pretreatment requirements” means any substantive or procedural requirement related to pretreatment, other than a pretreatment standard, imposed on an industrial user.

"Pretreatment standard" means any prohibitive discharge standards, categorical pretreatment standards and/or local limitations on wastewater discharge characteristics.

"Private sewer," "building sewer" or "house service sewer" means that part of the building sewer beginning at the junction thereof with the building plumbing or drainage system and terminating at the property line or at the easement line.

"Properly shredded garbage" means the wastes from the preparation, cooking, and dispensing of food that have been shredded to such a degree that all particles shall be carried freely under the flow conditions normally prevailing in public sewers, with no particles greater than one-half inch (1.27 centimeters) in any dimension.

"Public sewer" ("community sewer") means a sewer directly controlled by the city.

"Radioactive material" means material containing chemical elements that spontaneously change their atomic structure by emitting any particles, rays or energy forms.

"Receiving water quality requirements" means requirements for the city's treatment plant effluent and/or the waters to which such effluent is discharged, established by law or by state or federal regulatory agencies, for the protection of receiving water quality.

"Residential discharger" means any discharger whose premises are used solely for residential purposes.

"Sanitary sewage" means any and all waste substances, liquids or solids associated with human habitation, excluding storm, surface and groundwaters, and industrial wastes.

"Sanitary sewer" means a sewer which carries only sanitary or sanitary and industrial wastewaters and to which storm, surface, and groundwaters are not intentionally admitted.

"Septage receiving station" means a facility at the Visalia Water Conservation Plant for receipt of septic and holding tank wastes.

“Septage waste” means the liquid and semi- solid material removed from septic tanks or other holding tanks used to temporarily contain domestic sewage.

“Septage waste hauler” means an entity permitted to transport septage waste from various locations to the wastewater treatment facility.

"Septic tank" means a watertight receptacle which receives the discharge of a drainage system or part thereof, designed and constructed so as to retain solids, digest organic matter through a period of detention, and allow the liquids to discharge into the soil outside of the tank through a system of open joint piping or a seepage pit meeting the requirements of the Uniform Plumbing Code.

"Sewage" ("wastewater") means a combination of the water-carried wastes from residences, commercial buildings, institutions, and industrial establishments, together with such ground, surface and storm waters as may be present.

"Sewerage system" means all facilities for collecting, pumping, storing, treating and disposing of sewage.

"Sewage treatment plant" means the city sewage treatment facilities known also as the water conservation plant or the wastewater treatment plant.

"Sewer" means a pipe or conduit for holding and carrying sewage, including manholes and all other appurtenance facilities which are necessary or convenient to the holding or carrying of sewage.

1. "House sewer" (building sewer) means that portion of the side sewer from the lateral sewer to its connection to the building drain.

2. "Interceptor sewer" means a public sewer in a public right-of-way receiving the discharges from main or trunk sewers and conveying said sewage to the sewage treatment plant.

3. "Lateral sewer" means that portion of the side sewer which is within the public right-of-way.

4. "Main sewer" means a publicly owned sewer in a public right-of-way to which side sewer connections from private properties are or may be connected for the disposal of domestic or industrial waste.

5. "Side sewer" means the privately owned and maintained sewer which connects the plumbing system of the building to the main sewer. The side sewer begins at the point of connection to the main sewer, including the wye, and terminates at the point of connection to the building drain two feet outside the foundation line or building wall. Side sewer includes the lateral sewer and the house sewer.

6. "Trunk sewer" means a public sewer in a public right-of-way receiving the discharge from one or more main sewers and conveying said sewage to another trunk sewer or to an interceptor sewer.

"Sewer service charge" means a charge established to obtain equitable payment from all dischargers for the cost of construction, operation and maintenance of the sewerage facilities.

"Shall" is mandatory; "may" is permissive.

“Significant industrial user” means any industrial user which:

1. May be subject to categorical pretreatment standards;

2. Discharges an average twenty-five thousand (25,000) gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater);

3. Contributes a process wastestream which makes up five percent or more of the average dry weather hydraulic or organic capacity of the treatment plant; or

4. Is designated as significant by the city on the basis that the industrial user has a reasonable potential for adversely affecting the operation of the system or for violating any pretreatment standard or requirement.

"Significant noncompliance" occurs when one or more of the following criteria occur:

1. Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all the measurements taken for the same pollutant parameter during a six (6)-month period exceed (by any magnitude) a numeric pretreatment standard or requirement, including instantaneous limits, as defined by 40 CFR 403.3(l);

2. Technical review criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of all the measurements taken for the same pollutant parameter during a six (6)-month period equal or exceed the product of the numeric pretreatment standard or requirement including instantaneous limits, as defined by 40 CFR 403.3(l) multiplied by the applicable TRC (TRC = 1.4 for BOD, TSS, fats, oil, and grease and 1.2 for all other pollutants except pH);

3. Any other violation of a pretreatment standard or requirement as defined by 40 CFR 403.3(l) (daily maximum, long-term average, instantaneous limit, or narrative standard) that the POTW determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of POTW personnel or the general public);

4. Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or to the environment or has resulted in the POTW's exercise of its emergency authority under paragraph 40 CFR 403.8 (f)(l)(vi)(B) to halt or prevent such a discharge;

5. Failure to meet, within ninety (90) days after the schedule date, a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance;

6. Failure to provide, within forty-five (45) days after the due date, required reports such as baseline monitoring reports, ninety (90)-day compliance reports, periodic self-monitoring reports, and reports on compliance with compliance schedules;

7. Failure to accurately report noncompliance;

8. Any other violation or group of violations, which may include a violation of best management practices, which the POTW determines will adversely affect the operation or implementation of the local pretreatment program.

"Slug" means any discharge of water, sewage, or industrial waste which in concentration of any given constituent or in quantity of flow exceeds for any period of duration longer than fifteen (15) minutes more than three times the average twenty-four (24) hour concentration or flows.

"Solid wastes" means the nonliquid carried wastes normally considered to be suitable for disposal with refuse at sanitary landfill refuse disposal sites.

"Street" means a public highway, road, street, avenue, alley way, public place, easement or right-of-way for vehicle or pedestrian use.

"Storm drain" ("storm sewer") means a sewer which carries storm and surface waters and drainage, but excludes sanitary sewage and industrial wastes, other than unpolluted cooling water.

"Suspended solids" means solids that either float on the surface of or are in suspension in, water, sewage, or other liquids; and which are removable by laboratory filtering.

"Trade secret" means any formula, plan, pattern, process, tool, mechanism, compound, procedure, production data, or compilation of information which is not patented, which is known only to certain individuals within a commercial concern who are using it to fabricate, produce or compound an article of trade or a service having commercial value, and which gives its user an opportunity to obtain a business advantage over competitors who do not know or use it.

"Trap" means any facility designed, constructed and operated for the purpose of removing and retaining dangerous, deleterious or prohibited constituents from wastewater by differential gravity separation before discharge to the public sewer.

"Unpolluted water" means water to which no constituent has been added, either intentionally or accidentally, which would render such water unacceptable to the agency having jurisdiction thereof for disposal to storm or natural drainages or directly to surface waters.

"Unsanitary" means contrary to those principles which are known to promote and safeguard health.

“User” means any person who discharges or causes the discharge of wastewater to a community sewer system or directly to the POTW. User shall mean the same as discharger.

"User classification" means a classification of users based on the 1987 edition of the Standard Industrial Classification (SIC) Manual prepared by the Federal Executive Office of Management and Budget.

"Waste" means and includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation of whatever nature, including such waste placed within containers of whatever nature prior to, and for purposes of, disposal.

"Wastewater constituents and characteristics" means the individual chemical, physical, bacteriological and radiological parameters, including volume and flow rate, and such other parameters that serve to define, classify or measure the contents, quality, quantity and strength of wastewater.

"Watercourse" means a channel in which a flow of water occurs either continuously or intermittently.

"Water softener" means a unit using the ion exchange process and requiring sodium chloride to regenerate the exchange bed designed to remove hardness (magnesium and/or calcium ions) from a water supply.

"Waters of the state" means any water, surface or underground, including saline waters, within the boundaries of the state. (Ord. 2011-08 § 2, 2011: Ord. 2006-02 (part), 2006: Ord. 2003-20 (part), 2003; Ord. 2000-18 §§ 1 (part), 2 (part), 2000: prior code §§ 4104--4199)

Article 3. Use of Public Sewers Required

13.08.050 Disposal of wastes.

It is unlawful for any person to place, deposit, or permit to be deposited in any unsanitary manner, upon public or private property within the city, or in an area under jurisdiction of said city, any human or animal excrement, garbage or other objectionable waste. (Ord. 2006-02 (part), 2006: Prior code § 4200)

13.08.060 Treatment of wastes required.

It is unlawful to discharge to any natural outlet or watercourse any sewage, industrial wastes, or other polluted waters, except where suitable treatment has been provided in accordance with provisions of this chapter. (Ord. 2006-02 (part), 2006: Prior code § 4201)

13.08.070 Unlawful disposal.

Except as provided in this chapter, it is unlawful to construct or maintain any privy, privy vault, septic tank, cesspool, seepage pit or other facility intended or used for the disposal of sewage. (Ord. 2006-02 (part), 2006: Prior code § 4202)

13.08.080 Occupancy prohibited.

No building, industrial facility or other structure shall be occupied until the owner of the premises has complied with this chapter. (Ord. 2006-02 (part), 2006: Prior code § 4203)

13.08.090 Private sewerage disposal systems--Continuation of use.

Whether or not public sewers exist or are installed in public streets or rights-of-way abutting annexed and developed properties, existing acceptable private sewerage disposal systems may continue to be maintained and used by the property owners for service of the dwellings and structures existing at the time of adoption of this chapter only, except as hereinafter restricted or excepted. Acceptable private sewerage disposal systems include adequate earth-covered underground septic tanks, cesspools, leach lines and wells, and/or combinations thereof. Determination of the acceptability of a private system shall be the responsibility of the city. (Ord. 2006-02 (part), 2006: Prior code § 4204)

13.08.100 Private sewerage disposal systems--Restrictions and exceptions, continuation of use.

A. Dwellings or structures connected to or utilizing privies, privy vaults, open cesspools, or similar unacceptable private sewerage disposal systems shall, immediately upon annexation to the city, be connected to an available public sewerage system.

B. Whenever it is determined that an existing adequate private sewerage disposal system is in need of major repairs to ensure continuation of the proper operation of that system, the dwelling or structure served must be connected to an available public sewerage system within sixty (60) days. Major repairs does not include such items as septic tank pumping and usual maintenance functions.

C. Whenever state or county health authorities, or the city, declare an individual private disposal system, or the systems in the area, to be a health hazard or to be creating a public nuisance, the use of such system, or systems, shall be discontinued within the period of time specified by the city and connection(s) to public sewer made forthwith.

D. Whenever an area, under the authority of the special assessment acts of the state of California is assessed for sewer

construction, all benefitted property owners may be required by the city council to connect to the public sewer system, where in the opinion of the council the conditions described in subsection (c) of this section exist or are incipient.

E. Where main sewers are installed, for the public welfare and at public expense, the city council may require abutting property owners to connect thereto within a period of time specified by the council. (Ord. 2006-02 (part), 2006: Prior code § 4205)

Article 4. Private Sewerage Disposal Construction

13.08.110 Prohibition of new systems or connections.

No new private sewerage disposal systems shall be constructed within the city, and no new dwellings or structures shall be connected to existing private systems; except as hereinafter excepted. (Ord. 2006-02 (part), 2006: Ord. 2003-20 (part), 2003; Prior code § 4206)

13.08.120 Sewer not available.

Where a public sewer is not available, the building sewer shall be connected to a private sewerage disposal system complying with the provisions of this chapter. (Ord. 2006-02 (part), 2006: Ord. 2003-20 (part), 2003; Prior code § 4207)

13.08.125 City's option to extend sewer.

Where there is no available public sewer, the city shall have the option, at its sole discretion, to extend the public sewer to within two hundred (200) feet of the property line and require connection thereto, as set forth herein. If the city waives its option to extend sewer system, such waiver shall be in writing from the city manager to the applicant. Such waiver is required prior to applicant commencing installation of a private sewage disposal system. (Ord. 2006-02 (part), 2006: Ord. 2003-20 (part), 2003

13.08.130 Permit required.

Before commencement of construction of a private sewage disposal system the owner shall first obtain a written permit from the city. The written application for such permit shall be supplemented by any plans, specifications, and other information deemed necessary by the city as well as the sewer extension waiver signed by city manager. A permit and inspection fee shall be paid to the city at the time application is filed, in accordance with the provisions of this chapter. (Ord. 2006-02 (part), 2006: Ord. 2003-20 (part), 2003; Prior code § 4208)

13.08.140 Inspection required.

A permit for a private sewage disposal system shall not become effective until the installation is completed to the satisfaction of the city. The city shall be allowed to inspect the work at any stage of construction and, in any event, the applicant for the permit shall provide twenty-four (24) hour notice to the city when the work is ready for final inspection, and before any underground portions are covered. (Ord. 2006-02 (part), 2006: Ord. 2003-20 (part), 2003; Prior code § 4209)

13.08.150 Design requirements.

The type, capacities, location and layout of a private sewage disposal system shall comply with recommendations of the department of public health of the state of California and the health officer of Tulare County, as determined by the city. No permit shall be issued for any private sewage disposal system requiring subsurface soil absorption capacity where the characteristics of the property do not indicate sufficient soil absorption qualities. No septic tank, cesspool, anaerobic tank or chemical process shall be permitted to discharge to any public sewer or any stream or watercourse. (Ord. 2006-02 (part), 2006: Prior code § 4210)

13.08.160 Cost of maintenance by owner.

The owner shall operate and maintain private sewage disposal facilities in a sanitary manner at all times, at no expense to the city. (Ord. 2006-02 (part), 2006: Prior code § 4211)

13.08.170 Additional requirements.

No statement contained in this article shall be construed to interfere with any additional requirements that may be imposed by any law, ordinance, rule or regulation administered by the county health office or city building inspector. (Ord. 2006-02 (part), 2006: Prior code § 4212)

Article 5. Sewer Extensions, Financing and Costs Repayment

13.08.180 Private financing.

The purpose of this article is to provide an expedient method of financing sewer construction in cases where all benefitted property owners do not wish to participate in such construction and shall not benefit therefrom until connecting to such sewer construction. The method shall provide for equal proportion of cost within a reasonable period of time among the parcels to be benefitted. The following method is not intended to be exclusive.

A. Petition for Extension. Owners of real property desiring to have the city sewer system extended in accordance with the

provisions of this article, shall make written application therefore to the city, stating the location and limits of the requested public sewer extension, together with a description of their property. The city shall evaluate the feasibility and practicality of the proposed sewer extension and shall estimate the cost of the project, including all costs normally charged by the city to persons extending public sewers, and shall submit to the council a map showing the area to be served and benefitted by said sewer extension. All such sewer extensions shall be within the boundary lines of a public street or a public easement. The sewer extension shall extend across the parcel boundaries being served. The minimum cost to any property owner shall be not less than required by Section 13.08.180(C). The city manager shall report to the city council regarding the proposed sewer extension and if the council determines said extension to be in the public interest, it may grant the request for initiation of the sewer extension project.

B. Deposit of Funds for Construction and Costs. Whenever the application of property owners for public sewer extension has been granted by the city council, the applicant shall deposit with the city, in cash, an amount equal to the total cost estimate of the project. No work shall be started upon the project until the specified deposit has been made.

C. Performance. The city shall prepare plans, specifications, and proposal agreements for the construction of the proposed public sewer extension and shall advertise for sealed proposals. Contracts shall be let to the lowest responsible bidder by the city council. Upon completion and acceptance of the work by the city, the city shall prepare a statement of the final cost of the public extension. If it shall be found that the actual cost upon completion of the project is less than the estimated cost, the excess of the money paid to the city shall be refunded to the applicants in the same proportion that it was paid to the city. When the actual cost exceeds the estimated cost, the applicants upon notice and demand shall forthwith pay the prorated deficiency in cash. No connection to the constructed sewer shall be permitted by the city until such additional payment, if necessary, is made.

D. Cost of Distribution. The city shall prepare a statement of the final cost of the public sewer, and a map showing the prorated costs to the various parcels of property benefitted.

E. Connection Requirements. Whenever the sewer system of the city has been extended in accordance with the provisions of this article, those owners of property benefitted, or their successors in interest who have not heretofore contributed their proportionate share of the cost of the public sewer extension in the amount set up in the city's final cost sheet, shall not be permitted to connect with the public sewer extension unless, and until, they shall have paid to the city the amount in cash stated on the city's final costs sheet, or the current year connection fee as required by Section 13.08.750(C), whichever is greater. All such payments shall be in addition to any other fees required by other city ordinances or regulations.

F. Private Sewers. Any property owner in the public sewer extension district who has, prior to said sewer extension, constructed a private sewer connection to the public sewer for his property at his own expense, shall not be required to contribute to the cost of said public sewer extension except where such property derives increased benefits therefrom as determined by the city and as approved by the council. Such property owner shall pay only the amount so approved before connecting his property to the public sewer extension.

G. Refunds. Periodically upon demand, the city shall refund to the persons originally paying for a sewer extension proportionate amounts paid to the city by property owners who did not participate in the original cost and who have been given permits to connect to the extended sewer and have paid for said connection as provided for in this chapter.

H. Termination of Refunds. Any claim by a contributing property owner for a refund which is available due to payment by benefitted property owners, shall be made within a period of ten years of the filing of the final cost statement. All money paid after the lapse of ten years shall be retained by the city.

I. Oversizing Sewer Mains. The city may oversize any sewer main from the minimum eight inch diameter if it is determined by the city that a larger line would be needed to serve other developments. If a larger line is installed, the city shall pay only the additional oversizing cost. (Ord. 2006-02 (part), 2006: Prior code § 4213)

13.08.190 Public financing.

The purpose of this article is to provide an equitable method for the assessing of costs and the financing of such costs for the provision of sanitary sewer service to developed lots within the city and/or annexing to the city. The following method is not intended to be exclusive.

A. Definitions and Restrictions.

1. A developed lot is defined for purposes of this article as a parcel of ground of record less than five acres, a parcel created by subdivision or lot split and any of the above occupied by a residential, institutional, or commercial structure.

2. The provisions of this article shall apply when at least ninety (90) percent of the area proposed for sewer service is composed of developed lots which are using private sewage disposal systems.

3. No area shall be considered for sewer service under the provisions of this article unless at least fifty (50) percent of the property owners of the developed lots sign a sewer connection agreement with the city in accordance with the procedures outlined hereinafter.

4. Developed lots larger than those in the surrounding neighborhood or subdivision which are subject to further development under existing zoning restrictions shall be assessed at charges higher than those described hereinafter when, in the opinion of the city engineer, such higher charges are required as a matter of equitable sewer cost assessment.

B. Financing of Sewer Extensions. Sewer extensions to be constructed under the provisions of this article may be financed by the city. The city must be reimbursed for this financed cost at such time as benefiting property owners connect to the sewer, except that sewers may be financed for a period not to exceed five years from the date of connection under the financing provisions of the short form of the 1911 Act, Chapter 27, (commencing with Section 5870 through 5895.54) of the Streets and Highways Code, state of California. The limits imposed with respect to such 1911 Act financing are a minimum annual payment to the city of fifty dollars ($50.00) plus interest with the repayment of the total amount due, with interest, to be completed in not more than five years. All monies received as a result of this chapter shall be paid to the Sanitation Fund of the city.

C. Public Financing. The city council shall establish annually by resolution the sewer connection fee which is to represent the total cost of public sewer facilities to the benefitted property owners under this article, which fee shall include and take the place of all other charges and fees other than the monthly sewer service charge specified in this chapter. Such resolution shall be adopted by the council in each calendar year. The resolution currently in effect shall prevail until such time as the resolution for the new year is adopted.

D. The connection fee shall be based on a recommendation by the city engineer considering the costs of sewer extensions for the preceding twelve-month period. The connection fee shall include the cost of sewer laterals to the property line, manholes, main line costs, plumbing permit, and the trunkline capacity charge and treatment plant capacity charge outlined in Section 13.08.750 and shall be a uniform cost per lot; except, that additional fees may be stipulated for additional dwelling units on such lots. The above provisions shall be dependent upon budgeted or specified allocations by the city council of funds sufficient to carry out the purposes of this subsection. The city council, by this chapter in no way undertakes to guarantee the provision of sewer service to any area within or annexing to the city except when, in the council's opinion, the city is able to finance such facilities, and when it is the council's judgment that there is priority need for such facilities with respect to other municipal service.

E. Sewer Connection Agreements. The property owner signing the sewer connection agreement consents to:

1. Pay any and all applicable sewer connection fees as set forth in Article 9, Sections 13.08.710 through 13.08.820;

2. Connect to the sewer line and pay the normal sewer service charge as set forth in Article 10, Sections 13.08.830 through 13.08.890. (Ord. 2006-02 (part), 2006: Prior code § 4214)

13.08.200 Existing sewer cost repayment.

The purpose of this article is to assure repayment to the city by directly benefitted property owners for connections to trunk sewers abutting properties not otherwise adequately served by the public sewer system, where such trunk sewers have been built at public expense and where the property owners directly connecting thereto receive benefits in excess of those accruing to the general area served by the trunk sewer; and further to require payment to the city for connection to main sewers where the owners and/or developers of connected and directly benefitted property have not paid for their proportionate share of the cost of construction of the main sewer.

A. Application. This article shall not apply to connections to existing sewers within the boundaries of the incorporated area of the city, as said boundaries existed on April 12, 1948, as outlined in the map thereof on file in the office of the city engineer.

B. Payment. Prior to issuance of a sewer connection permit for properties desiring to connect directly to the aforementioned trunk sewers, or main sewers, the persons desiring to connect thereto shall pay to the city a cost determined annually by council resolution under Section 13.08.750. It is the intent of this article to provide that property owners directly benefitted by the construction of trunk or main sewers at a location where they may connect directly thereto without extension of the public sewer, shall pay to the city the costs which they would normally have incurred were they to have constructed, or to have participated in the construction of, sewer facilities to serve their property. Single-family residences within the city limits of the city which are permitted to connect to an existing sanitary sewer line may have their charges set on the tax roll if they so elect. The procedure of the short form of the 1911 Act assessment as set forth in the Street and Highways Code, Chapter 27 shall be followed. The limits imposed are a minimum annual payment to the city of fifty dollars ($50.00), with the repayment of all charges, with interest, to be completed in not more than five years.

C. Exceptions. The provisions of this article shall apply to connection to existing main or trunk sewer lines with the following exceptions:

1. Those sewers constructed under the provisions of either the short or long form of the 1911 Act of the state of California Streets and Highways Code where assessments are or have been made on the basis of benefits;

2. Sewer connections of the existing single family dwellings in those areas which are deemed by the council to be unable to finance public sewer improvements and described as such by council resolution, said boundaries being as outlined on maps thereof on file in the city engineer's office;

3. Sewers constructed under the provisions of Sections 13.08.180 or 13.08.190 or similar provisions of prior city ordinances;

4. Sewers constructed under council annexation agreements;

5. Sewers constructed pursuant to approved development agreements.

D. Disposition of Funds. All monies received as a result of this section shall be deposited into the sanitation fund of the

city. No monies received as a result of this chapter shall be repayable to any developer or property owner who has constructed main sewers for the benefit of his property. Such repayments shall be made only when the developer or property owner has fully complied with the provisions of Section 13.08.180. Further, no developer or property owners shall have the right to sell, lease, assign, or otherwise purport to convey sewer connection rights to any main sewer for other than directly benefitted properties owned by said developer at the time of design approval by the city. (Ord. 2006-02 (part), 2006: Prior code § 4215)

13.08.205 Payment for sewer connections prior to July 1, 2010.

Notwithstanding the provisions of Section 13.08.190 B. and Section 13.08.200 B., payment for connection of single family residences inside the city limits made to sanitary sewer lines after January 1, 2004 and prior to July 1, 2010, may be placed on the county tax roll pursuant to the provisions of Chapter 27 of the Streets and Highways Code, with the repayment of all charges, with interest, to be completed in not more than ten (10) years.

(Ord. 2006-02 (part), 2006: Ord. 2003-15 (part), 2003)

Article 6. Side Sewers and Connections

13.08.210 Permit required.

No person shall cause or permit a premises to be initially connected to the sewer system nor shall any person increase the number of dwelling units on residential premises connected to the sewer system, change the use of residential premises connected to the sewer system to a nonresidential use, increase the area of nonresidential premises devoted to a nonresidential use, or change the use of nonresidential premises to a residential use without a connection permit issued by the director as provided by this chapter. (Ord. 2006-02 (part), 2006: Ord. 2000-18 §§ 1 (part), 2 (part), 2000: prior code § 4216)

13.08.220 Installation and/or connection of lateral sewers by city.

A. Except as otherwise directed by the city, the city shall install all lateral sewers, making connections therefrom to main and trunk sewers, and charging the property owner for the costs thereof. This installation shall terminate at the property line (street right-of-way line); line and grade to said termination shall be determined by the city engineer, as shall procedures for requesting such installations.

B. Where determined by the city engineer to be in the best interest of the city and/or the property owner, and in all new subdivision installations, the property owner shall be requested to have the lateral sewer installed by a licensed contractor in lieu of city installation. In such instances, the city shall be responsible for cutting wyes into existing sewers.

C. In either case, city installation or property owner installation, all costs and expenses incident to the installation and connection of a lateral sewer shall be borne by the owner, except where otherwise provided in this chapter. (Ord. 2006-02 (part), 2006: Prior code § 4217)

13.08.230 Design considerations.

Minimum size and slope in the side sewer shall be in accordance with the requirements of the city. (Ord. 2006-02 (part), 2006: Prior code § 4218)

13.08.240 Separate sewers.

Every building must be separately connected to a public sewer. No two adjacent lots abutting the same area shall be permitted to join in the use of the same side sewer. However, one or more buildings located on premises belonging to the same owner may be served with the same side sewer during the period of said ownership. Upon the subsequent subdivision and/or sale of a portion of said lot, the portion not directly connected with such public sewer shall be separately connected with a public sewer, and it is unlawful for the owner thereof to continue to use or maintain such indirect connection. (Ord. 2006-02 (part), 2006: Prior code § 4219)

13.08.250 Sewer too low.

In any building in which any portion of the building drain or building sewer is too low to permit gravity flow to the public sewer, sewage drained by such building drain or sewer shall be lifted by artificial means, approved by the city engineer, and discharged to the public sewer at the expense of the owner. (Ord. 2006-02 (part), 2006: Prior code § 4220)

13.08.260 Connection to public sewer.

The applicant for a side sewer permit shall notify the city when the building sewer is ready for inspection and connection to the public sewer or lateral sewer. (Ord. 2006-02 (part), 2006: Prior code § 4221)

13.08.270 Safety precautions.

All excavations for a side sewer installation being installed by the owner's contractor shall be maintained in a safe and workmanlike manner, and adequately guarded with barricades and/or lights so as to protect the public from hazard, in full accordance with all applicable state and federal regulations. (Ord. 2006-02 (part), 2006: Prior code § 4222)

13.08.280 Completion of work.

Streets, sidewalks, parkways and other property disturbed in the course of a contractor's work shall be restored in a manner satisfactory to the city. (Ord. 2006-02 (part), 2006: Prior code § 4223)

13.08.290 Maintenance of side sewers.

Side sewers, including lateral sewers and wyes, shall be maintained by the owner of the property served in good order and condition, at his or her sole cost and expense. (Ord. 2006-02 (part), 2006: Prior code § 4224)

Article 7. Public Sewer Construction

13.08.300 Permit required.

No person shall construct, extend or connect to any public sewer without first obtaining a written permit from the city and paying all fees and connection charges and furnishing bonds and/or cash deposits as required herein. The provisions of this section requiring permits shall not be construed to apply to contractors constructing sewers and appurtenances under contracts awarded and entered into with the city. (Ord. 2006-02 (part), 2006: Prior code § 4225)

13.08.310 Plans, profiles and specifications required.

A. The application for a permit for public sewer construction shall be accompanied by complete plans, profiles and specifications, complying with all applicable ordinances, rules and regulations of the city, prepared by a registered civil engineer, showing all details of the proposed work.

B. The application, together with the plans, profiles and specifications shall be examined by the city engineer who shall within twenty (20) working days approve them as filed or require them to be modified as deemed necessary for proper installation. When the city engineer is satisfied that the proposed work is proper and that the plans, profiles and specifications are sufficient and correct, he shall order the issuance of a permit predicated upon the payment of all connection charges, fees and deposits and furnishing required bonds. The permit shall prescribe such terms and conditions as necessary in the public interest. (Ord. 2006-02 (part), 2006: Prior code § 4226)

13.08.320 Subdivision.

The requirements of Sections 13.08.300 and 13.08.310 shall be fully complied with before any final subdivision map shall be approved by the city council. The final subdivision map shall provide for the dedication for public use of all streets, easements or rights of way in which public sewer lines are to be constructed. (Ord. 2006-02 (part), 2006: Prior code § 4227)

13.08.330 Easements or rights-of-way.

In the event that an easement is required for an extension of the public sewer, the applicant shall procure and have accepted by the city council a proper easement or grant of right-of-way sufficient in law to allow the laying and maintenance of such extension. (Ord. 2006-02 (part), 2006: Prior code § 4228)

13.08.340 Persons authorized to perform work.

Only properly licensed contractors shall be authorized to perform the work of public sewer construction within the city. All terms and conditions of the permit issued by the city to the applicant shall be binding on the contractor. The requirements of this section shall apply to side sewers installed concurrently with public sewer construction. (Ord. 2006-02 (part), 2006: Prior code § 4229)

13.08.350 Grade stakes.

Grade and line stakes shall be set by a registered civil engineer prior to the start of work on any public sewer construction. The contractor shall be responsible for accurately transferring grades to sewer inverts. The engineer shall provide copies of cut sheets to the contractor and to the city. (Ord. 2006-02 (part), 2006: Prior code § 4230)

13.08.360 Compliance with local regulations.

Any person constructing a sewer within a street or public right-of-way or easement shall comply with all state, county or city laws, ordinances, rules and regulations pertaining to the cutting of pavement, opening, barricading, lighting and protecting of trenches, backfilling and repaving thereof, and shall obtain all permits and pay all fees required by other departments having jurisdiction prior to the issuance of a permit by the city. (Ord. 2006-02 (part), 2006: Prior code § 4231)

13.08.370 Protection of excavation.

A. The applicant shall maintain such barriers, lights and signals as are necessary to give warning to the public at all times that a sewer is under construction and of each dangerous condition to be encountered as a result thereof. Applicant shall also likewise protect the public in the use of the sidewalk against any such conditions in connection with the construction of the sewer. Streets, sidewalks, parkways and other property disturbed in the course of the work shall be reinstalled in a manner satisfactory to the city or any other public agency having jurisdiction thereover.

B. If the city engineer determines that the construction site is not adequately signed and the contractor evades the

engineer's warning or it is after working hours, the engineer shall have the recourse to obtain the necessary signing devices from any source available and all costs related thereto shall be borne by the contractor. (Ord. 2006-02 (part), 2006: Prior code § 4232)

13.08.380 Design and construction standards.

Minimum standards for the design and construction of sewers within the city or subject to the jurisdiction of the city shall be the "Sanitary and Storm Sewer Specifications" of the city. The city engineer may permit modifications of those specifications or may require higher standards where unusual conditions are encountered. "As-built" drawings showing the actual location of all sewers, structures, wyes, and laterals shall be filed with the city before final acceptance of the work. (Ord. 2006-02 (part), 2006: Prior code § 4233)

13.08.390 Bond--Public sewer construction.

Prior to the issuance of a permit for public sewer construction the applicant shall furnish to the city a faithful performance bond or cash deposit in the amount of the total estimated cost of the work. Said bond shall be in the minimum amount of one thousand dollars ($1,000.00) and shall be secured by a surety or sureties satisfactory to the city. The cash deposit or faithful performance bond shall be conditioned upon the performance of the terms and conditions of the permit and shall guarantee the correction of faulty workmanship and the replacement of defective materials for a period of one year after the date of acceptance of the work. (Ord. 2006-02 (part), 2006: Prior code § 4234)

13.08.400 All work to be inspected.

All sewer construction work, building sewers, plumbing and drainage systems shall be inspected by an inspector acting for the city to insure compliance with all requirements of the city. No sewer shall be covered at any point until it has been inspected and passed for acceptance. No sewer shall be connected either directly or indirectly to the city's public sewer system until the work covered by appropriate permit has been completed, inspected and approved. All sewers shall be cleaned of all debris accumulated from construction operations. (Ord. 2006-02 (part), 2006: Prior code § 4235)

13.08.410 Notification.

It shall be the duty of the person doing the work authorized by permit to notify the office of the city that said work is ready for inspection. Such notification shall be given not less than twenty-four (24) hours before the work is to be inspected and if notice is made verbally, it shall be followed by written notice. It shall be the duty of the person doing the work to make sure that the work is ready for inspection by the city before giving the above notification. (Ord. 2006-02 (part), 2006: Prior code § 4236)

13.08.420 Correct notices.

When any work has been inspected and the work is unsatisfactory, a written notice to that effect shall be given instructing the permittee, or the agent of such permittee, within ten days, to comply to such order or notice for work authorized by the permit in accordance with the ordinances, rules and regulations of the city. (Ord. 2006-02 (part), 2006: Prior code § 4237)

13.08.430 All costs paid by owner.

All costs and expenses incident to the installation and connection of any sewer or other work for which a permit has been issued shall be borne by the permittee. The permittee shall indemnify the city from any loss or damage that may directly or indirectly be occasioned by the work. (Ord. 2006-02 (part), 2006: Prior code § 4238)

13.08.440 Contract with outside industrial and commercial users.

A. Use by an industry or commercial establishment located outside the city limits ("outside user") shall not be granted if it shall impair the usage of the sewer system or any part thereof by property within the city.

B. Enlargements, extensions or modifications of the city sewer system for use by outside industries or commercial establishments, shall be solely at the cost of such user and the city shall, upon completion, be granted title to and hold full control of such extension, enlargements or modifications.

C. Failure or refusal of any outside user to comply with any condition of this article or of any contract granted hereunder, shall be sufficient grounds for cutting off its connection with the sewer system after five days written notice thereof by the city.

D. Determination by the city that the use of the city sewer system by an outside user is resulting in impairment of the use by property within the city, shall give the city the conclusive right to terminate any contract user's further use of said city sewer system or any part thereof.

E. Any existing contracts with outside users for city sewer system usage shall not be modified by the provisions of this chapter until such time as such contracts have terminated.

F. Maximum protection to the city shall be provided in the drafting of any contract and such protection shall include enforcement of the pretreatment provisions of the city's NPDES permit and provision for annexation to the city of the property occupied by users at such time as annexation is, in the opinion of the city, feasible, with sufficient penalty fees in said contract to guarantee compliance with this stipulation.

G. All contracts with outside users shall be approved by the city council.

H. Permission shall not be granted to connect any lot or parcel of land outside the city to any public sewer in or under the jurisdiction of the city unless a permit thereof is obtained. The applicant shall first enter into a contract in writing whereby he shall bind himself, his heirs, successors and assigns to abide by all ordinances, rules and regulations in regard to the manner in which such sewer shall be used, the manner of connecting therewith, and the plumbing and drainage in connection therewith and also shall agree to pay all fees required for securing the permit and a monthly fee in the amount set by the city for the privilege of using such sewer. The granting of permission for connection to the city sewer system by an outside user shall be optional with the city council. (Ord. 2006-02 (part), 2006: Prior code § 4239)

13.08.450 Street excavation permit.

A separate permit must be secured from the city or the county or any other person having jurisdiction thereover by permittees or contractors intending to excavate in a public street for the purpose of installing sewers or making sewer connections.

A. No person shall enter, obstruct, uncover or tamper with any portion of the public sewer, or connect to it, or dispose anything into any sewer and/or sewer manhole without the written permission of the city engineer.

B. No person or party shall remove or demolish any building or structures with plumbing fixtures connected directly or indirectly to the public sewer without first notifying the city engineer of such intention. All openings in or leading to the public sewer line or lines caused by such work shall be sealed watertight and inspected by the city engineer before being backfilled.

C. No person shall fill or backfill over, or cause to cover, or obstruct access to, any sewer manhole.

D. No person shall erect any improvements, structures, or buildings over public sewers without the written permission of the city engineer. (Ord. 2006-02 (part), 2006: Prior code § 4240)

13.08.460 Liability.

A. The city and its officers, agents and employees shall not be answerable for any liability or injury or death to any person or damage to any property arising during or growing out of the performance of any work by any permittee. The permittee shall be answerable for, and shall save the city and its officers, agents and employees harmless from any liability imposed by law upon the city or its officers, agents or employees, including all costs, expenses, fees and interest incurred in defending same or in seeking to enforce this provision. The permittee shall be solely liable for any defects in the performance of permittee's work or any failure which may develop therein.

B. Every person, firm, company, corporation, or organization applying for a permit shall file with the engineering department a policy, true copy thereof, or certificate of insurance, accompanied by an endorsement signed by the underwriter or an authorized representative, as evidence that the applicant has obtained and maintains and shall require all of its subcontractors to maintain the following insurance requirements:

1. Comprehensive general liability coverage with limits of not less than one million dollars ($1,000,000.00) combined single limit per occurrence for bodily injury, personal injury, and property damage. Such insurance shall: (a) name city, its appointed and elected officials, officers, employees and agents as additionally insureds; and (b) be primary with respect to any insurance or self-insurance programs maintained by the city; and (c) contain standard cross liability provisions;

2. Commercial automobile liability insurance with a combined single limit of no less than five hundred thousand dollars ($500,000.00) per occurrence. Applicants whose transportation operations are governed by the public utilities commission shall possess limits as required by the commission;

3. Worker's compensation coverage with statutory limits, and employer's liability insurance with limits of not less than one million dollars ($1,000,000.00) per accident.

C. Greater amounts may be required as determined by the city from time to time by resolution. Permittee must pay premiums thereon and permittee shall not commence work until all insurance required has been obtained and such insurance has been approved by the city. (Ord. 2006-02 (part), 2006: Prior code § 4241)

13.08.470 Time limit on permits.

If work under a permit is not commenced within six months from the date of issuance or if after partial completion the work shall be discontinued for a period of six months, or if the connection or work authorized by such permit is not completed within one year from date of issuance of permit, the permit shall thereupon become void and no further work shall be done until a new permit shall have been secured. A new fee shall be paid upon the issuance of said new permit. (Ord. 2006-02 (part), 2006: Prior code § 4242)

Article 8. Regulation of Wastewater Discharges

13.08.480 Prohibitions on discharges.

No user shall introduce or cause to be introduced into the POTW any pollutant or wastewater which causes pass through or interference. These general prohibitions apply to all users of the POTW whether or not they are subject to categorical pretreatment standards or any other National, State, or local pretreatment standards or requirements.

No person shall discharge to a public sewer wastes which, in the opinion of the director, cause, or are capable of causing either alone or by interaction with other substances:

A. A fire or explosive hazard;

B. Obstruction of flow in a sewer system or injury of the system or damage to the wastewater collection, treatment or disposal facilities;

C. Danger to life or safety of personnel;

D. A nuisance, or prevention of the effective maintenance or operation of the sewer system, through having a strong, unpleasant odor;

E. Air pollution by the release of toxic or malodorous gases or malodorous gas-producing substances;

F. No person or industrial user shall discharge to the city's facilities any substance which has or contains:

1. An end-of-pipe discharge temperature in excess of one hundred fifty (150) degrees Fahrenheit (sixty-five and one-half (65.5) degrees C), or a temperature which will inhibit biological activity in the treatment plant, but in no case heat which will cause the influent at the headworks of the treatment plant to exceed one hundred four (104) degrees F (forty (40) degrees C);

2. More than two hundred (200) mg/l of total oil or grease;

3. Any gasoline, benzene, naphtha, fuel oil or other inflammable or explosive liquid, solid or gas;

4. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in amounts that will cause interference or pass through;

5. Any garbage that has not been properly shredded;

6. Any ashes, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, wood, or any other solid, or viscous substance capable of causing obstructions to the flow in sewers or other interference with the proper operation of the sewage system;

7. Any waters or wastes having a pH lower than 5.5 or higher than 9.0 or having any other corrosive characteristic capable of causing damage or hazard to structures, equipment or personnel of the sewage system;

8. Any waters or wastes containing toxic or poisonous substances in sufficient quantity to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals or create any hazard in the receiving waters of the sewage treatment plant;

9. Any noxious or malodorous gas or substance capable of creating a public nuisance;

10. No discharge to the sewer shall be permitted that when blended with the remaining city flow shall cause an excess of the following constituent levels in the discharge from the sewage treatment plant.

a. Chlorides: one hundred fifty (150) mg/l,

b. Dissolved solids: six hundred (600) mg/l,

c. Sodium ratio: seventy (70) percent,

d. pH, outside limits: 6.5-8.5 ph units;

11. Which exerts an excessive chemical oxygen demand or chlorine demand to such a degree that the total wastewater received at the sewage treatment plant exceeds treatable limits, as established by the city, for such wastewater;

12. Which shall produce discoloration of the sewage treatment plant effluent;

13. With a volume of flow or concentration of wastes constituting "slugs" as defined in Section 13.08.040;

14. Any substance which may cause the treatment plant's effluent or any other product of the treatment plant such as residues, sludges, or scums, to be unsuitable for reclamation and reuse or to interfere with the reclamation process. In no case shall a substance discharged to city's facilities cause the plant to be in noncompliance with sludge use or disposal criteria, guidelines or regulations developed under Section 405 of the Act; any criteria, guidelines, or regulations affecting sludge use or disposal developed pursuant to the Solid Waste Disposal Act, the Clean Air Act, the Toxic Substances Control Act, or State criteria applicable to the sludge management method being used;

15. Any substance which may cause the treatment plant to violate its NPDES permit or the receiving water quality standards;

16. Pollutants which create a fire or explosive hazard in the city's wastewater collection and/or treatment systems, including, but not limited to, wastestreams with a closed-cup flashpoint of less than one hundred forty (140) degrees F (sixty (60) degrees C) using the test methods specified in 40 CFR Part 261.21.

G. A detrimental environmental impact or a nuisance in the waters of the state or a condition unacceptable to any public agency having regulatory jurisdiction over the city; discoloration or any other condition in the quality of the city's treatment

works effluent in such a manner that receiving water quality requirements established by city's NPDES permit cannot be met;

H. Conditions at or near the city's treatment works which violates any statute or any rule, regulation, or ordinance of any public agency or state or federal regulatory body;

I. Quantities or rates of flow which overload the city's collection or treatment facilities or cause excessive city collection or treatment costs. (Ord. 2011-08 § 3, 2011: Ord. 2006-02 (part), 2006: Prior code § 4245)

13.08.490 Prohibitions on storm drainage and ground water.

Storm water, ground water, rain water, water well development water, monitoring well discharge, swimming pool filter backwash, street drainage, subsurface drainage, irrigation drainage, or yard drainage shall not be discharged through direct or indirect connections to a community sewer. The city shall require cessation of such discharge if found to be existing. (Ord. 2006-02 (part), 2006: Prior code § 4246)

13.08.500 Prohibition on unpolluted water.

Unpolluted water, including, but not limited to, cooling water, process water or blow-down from cooling towers or evaporative coolers, or surface drainage from streets, curb and gutter or parking lots, shall not be discharged through direct or indirect connection to a public sanitary sewer. All installations of air-conditioning systems require the issuance of a permit therefore by the city and the payment of customary building and/or plumbing permit fees to the city prior to commencement of installation. All evaporative coolers shall be furnished with a circulating pump or be drained to yard areas, seepage wells or leaching devices, or storm drains. All new installations of industrial, commercial or residential air conditioning units shall have cooling water discharge recirculated or shall be of such type as not to require cooling water discharge. In no case shall discharge be permitted to be connected to the sanitary sewer system; except, that condensation only from cooling towers may be discharged to the sanitary sewer system by permit only. In no case shall water from evaporative coolers or air conditioning units be allowed to discharge onto public streets, alleys or sidewalks or to in any manner create a public nuisance. (Ord. 2006-02 (part), 2006: Prior code § 4247)

13.08.510 Limitations on radioactive wastes.

No person shall discharge or cause to be discharged, any radioactive waste into a community sewer. (Ord. 2006-02 (part), 2006: Prior code § 4248)

13.08.520 Limitations on the use of garbage grinders.

A. Waste from garbage grinders shall not be discharged into a community sewer except:

1. Wastes generated in preparation of food normally consumed on the premises;

2. Where the user has obtained a permit for that specific use from the city, and agrees to undertake whatever self-monitoring is required to enable the city to equitably determine the user charges based on the waste constituents and characteristics.

B. Such grinders must shred the waste to a degree that all particles shall be carried freely under normal flow conditions prevailing in the community sewer, with no particles greater than one-half inch (1.27 centimeters) in any dimension. Garbage grinders shall not be used for grinding plastic, paper products, inert materials, or garden refuse. The installation and operation of any garbage grinder equipped with a motor of one-half horsepower or greater shall be subject to the review and approval of the city. (Ord. 2006-02 (part), 2006: Prior code § 4249)

13.08.530 Limitations on point of discharge.

No person shall discharge any substances directly into a manhole or other opening in a community sewer other than through an approved side sewer, unless upon written application by the discharger and payment of the applicable charges and fees, the city issues a permit for such direct discharges. (Ord. 2006-02 (part), 2006: Prior code § 4250)

13.08.540 Holding tank waste and septic tank waste.

A discharger proposing to discharge holding tank waste and septic tank waste into the septage receiving station must secure a permit. No discharge shall be allowed to any location except the septage receiving station. If a permit is granted for discharge of such waste, the discharger shall pay the applicable user charges and fees and shall meet such other conditions as required by the city. (Ord. 2006-02 (part), 2006: Prior code § 4251)

13.08.550 Limitations on wastewater strength.

A. No person or industrial discharger shall discharge wastewater containing in excess of the following instantaneous maximum allowable limitations:

Pollutant	Instantaneous Maximum Allowable Discharge Limit (mg/l)
Arsenic	0.05
Cadmium	0.02

Chromium	3.44
Copper	1.97
Cyanide	0.16
Lead	0.30
Mercury	0.02
Nickel	2.86
Silver	0.76
Zinc	0.64

B. No person or industrial user shall discharge wastes with an electrical conductivity in excess of the flow weighted average EC of the source water plus five hundred (500) umhos/cm or a total of one thousand (1,000) umhos/cm, whichever is lower, except as provided for below.

C. To promote and encourage water conservation efforts, the maximum allowable electrical conductivity may be adjusted as determined by the following formulas and definitions

1. Definitions

"EC regulatory" shall mean flow weighted average EC of the source water plus five hundred (500) umhos/cm or a total of one thousand (1,000) umhos/cm, whichever is lower. Flow weighted average EC for source water shall be based on the local public or private water supplier's annual water quality report.

"EC industry" shall mean derived flow weighted monthly average EC permit limit for an industrial user. The maximum EC industry value due to water conservation efforts is one thousand (1,000) umhos/cm.

"EC small industry" shall mean derived flow weighted monthly average EC permit limit for an industrial user discharging less than five thousand (5,000) gallons per day.

"Flow industry" shall mean measured or estimated wastewater flow volume for an industrial user.

"Flow conserved" shall mean documented and verified process wastewater flow volume reduction due to water conservation efforts.

"Flow small industry" shall mean measured or estimated wastewater flow volume for an industrial user that is less than five thousand (5,000) gallons per day.

2. Formulas.

$$\text{EC Industry} = \frac{[\text{EC Regulatory} \times (\text{Flow Industry} + \text{Flow Conserved})]}{(\text{Flow Industry})}$$

For industries with measured or estimated wastewater flow that is less than five thousand (5,000) gallons per day, the following formula is utilized.

$$\text{EC Small Industry} = \frac{[\text{EC Regulatory} \times (0.005\ \text{MGD} + \text{Flow Conserved})]}{(\text{Flow Small Industry})}$$

3. Those industries that have EC limits higher than those listed above resulting from a previous action are grandfathered with their existing limit. For grandfathered EC limits, no credit for water conservation measures may be taken to obtain a higher EC limit.

D. Notwithstanding the limitations that are set forth in subsection (A) of this section:

1. The city may impose more restrictive standards or requirements on discharges if it is deemed necessary to comply with the objectives of this ordinance, specific prohibitions or the terms of the city's NPDES permit;

2. The city may authorize discharges containing higher concentrations of specific pollutants on a site- specific basis, provided that the concentrations of such discharges shall not cause pass through or interference. Upon approval by the city, site-specific limitations shall be established through the terms specified in the discharger's industrial discharge permit. The city may impose mass limitations in addition to, or in place of, concentration based limitations. However, no special agreement shall be allowed to contravene federal, state or local pretreatment standards.

E. No person or industrial user shall ever increase the use of process water, or in any way attempt to dilute a discharge, as a partial or complete substitute for adequate treatment to achieve compliance with a discharge limitation unless expressly authorized by an applicable pretreatment standard or requirement. The city may impose mass limitations on industrial users which are using dilution to meet applicable pretreatment standards or requirements, or in other cases when the imposition of mass limitations is appropriate. (Ord. 2011-08 § 4, 2011: Ord. 2006-02 (part), 2006: Prior code § 4252)

13.08.560 Limitations on infectious waste.

A. Infectious wastes which have been rendered noninfectious prior to grinding as specified in Title 22, California Code of Regulations, Section 66840(i) from hospitals, clinics, and mortuaries may be disposed of to the sanitary sewer system subject to the following limitations and requirements:

1. Pathologic specimens may not be disposed of to the sanitary sewer system;

2. The material shall be ground by an approved grinder having the capabilities of meeting or exceeding the following fineness: at least forty (40) percent shall pass a No. 8 sieve; at least sixty-five (65) percent shall pass a No. 3 sieve, and one hundred (100) percent shall pass a 3/8-inch screen opening;

3. Ground organic kitchen waste from hospital food preparation and disposal facilities excluding all paper and plastic items may be discharged into the sanitary sewer system;

4. Disposable hypodermic needles, syringes, and associated articles following their use in hospitals, out-patient clinics, medical and dental offices, etc., may not be discharged to the sanitary sewer system;

5. The materials must not violate any other requirements of these rules and regulations.

B. The following shall not be discharged to the sanitary sewer by any means:

1. Solid wastes generated in the rooms of patients who are isolated because of a suspected or diagnosed communicable disease;

2. Recognizable portions of the human anatomy;

3. Wastes excluded by other provisions of this title except as specifically permitted in this section.

C. All hospitals within the limits of the city desiring to dispose of a ground "infectious waste" by discharge into facilities of the city shall first have a valid nonsignificant discharge permit. All applicants for such permits shall fill out completely the application form, pay the appropriate fee, receive a copy of the city regulations governing discharge of ground hospital wastes, and shall agree in writing to abide by the regulations. The nonsignificant discharge permit shall be valid for a period not to exceed four years from date of issuance.

D. Nothing in this section shall be construed to limit the authority of the health officer of Tulare County to define wastes as being infectious. (Ord. 2006-02 (part), 2006: Prior code § 4253)

13.08.570 Traps required.

Grease, oil and sand traps shall be provided when, in the opinion of the City, they are necessary for the protection of the sewerage system from liquid wastes containing grease in excessive amounts, or any flammable wastes, sand and other harmful ingredients; except that such traps shall not be required for buildings used solely for residential purposes. Such traps shall be required, for example, on discharges from all service stations, automotive repair garages, car washes, restaurants, eating establishments and food preparation establishments, and such other commercial or industrial establishments as the city may designate. (Ord. 2006-02 (part), 2006: Prior code § 4254)

13.08.580 Construction of traps.

All traps shall be of a type and capacity approved by the city, and shall be so located as to be readily and easily accessible for cleaning and inspection. Restaurant traps shall be gas-tight, of a type approved for restaurant use by the division of building safety. Traps for all other facilities, including service stations and garages, shall be in accordance with the adopted plan of the city for such traps or shall be the approved equal thereof as determined by the director. (Ord. 2006-02 (part), 2006: Prior code § 4255)

13.08.590 Maintenance of traps.

When installed, all grease, oil and sand traps shall be maintained by the owner, at owner's expense, in continuously efficient operation at all times. (Ord. 2006-02 (part), 2006: Prior code § 4256)

13.08.600 Pretreatment of wastes.

The admission into the public sewers of any waters or wastes having (a) a five-day biochemical oxygen demand greater than three hundred fifty (350) milligrams per liter; (b) containing more than three hundred fifty (350) milligrams per liter of suspended solids; (c) having the characteristics described in Section 13.08.550 (C) or constituent levels in excess of those enumerated in Section 13.08.550 (A); or (d) having an average daily flow greater than .05 MGD, or one percent of the average daily sewage flow of the city, shall be subject to the review and approval of the city. When necessary in the opinion of the city the discharger shall provide, at his/her expense, such pretreatment as may be necessary to: (a) reduce the BOD discharge to three hundred fifty (350) mg/l and suspended solids to three hundred fifty (350) mg/l; (b) reduce objectionable characteristics or constituents to within the maximum limits provided in Section 13.08.550; or (c) control the quantities and rates of discharge of such water or wastes. Plans, specifications, and any other pertinent information relating to proposed pretreatment facilities shall be submitted for the approval of the city and no construction of such facilities shall be commenced until said approval is obtained in writing. Material which shall readily settle, such as sand, glass, metal filings and diatamaceous earth, for example, or floatable material which is readily removable shall be removed from wastewater

prior to discharge to the public sanitary sewer system. The review and approval of such plans and/or proposed operation procedures shall in no way relieve the discharger from the responsibility of modifying the facility as necessary to produce an effluent acceptable to the city and in accordance with federal and state standards, under the provisions of this chapter. Any subsequent changes in the pretreatment facilities or method of operation shall be reported in writing to and be approved by the city. (Ord. 2006-02 (part), 2006: Prior code § 4257)

13.08.610 Maintenance of pretreatment facilities.

When preliminary treatment facilities are provided for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the owner at owner's expense. (Ord. 2006-02 (part), 2006: Prior code § 4258)

13.08.620 Monitoring facilities.

The city may require the discharger to construct, at discharger's own expense, monitoring facilities to allow inspection, sampling, and flow measurement of the building sewer or internal drainage systems and may also require sampling or metering equipment to be provided, installed, and operated at the dischargers expense. The monitoring facility shall be situated on the discharger's premises. If the monitoring facility is inside the discharger's fence, there shall be accommodations to allow access for city personnel, such as a gate secured with a city lock. There shall be ample room in or near such sampling manhole to allow accurate sampling and compositing of samples for analysis. The manhole, sampling and measuring equipment shall be maintained at all times in a safe and proper operating condition at the expense of the discharger, regardless of whether located on private or public property. Whether constructed on public or private property, the sampling and monitoring facilities shall be provided in accordance with city requirements, construction standards and specifications. (Ord. 2006-02 (part), 2006: Prior code § 4259)

13.08.630 Inspection and sampling.

The city shall inspect the facilities of any discharger to ascertain whether the purpose of this chapter is being met and all requirements are being complied with. Persons or occupants of premises where wastewater is created or discharged shall allow the city or its representatives ready access at all reasonable times to all parts of the premises for the purposes of inspection, sampling, records examination or in the performance of any of their duties. The city, state and EPA shall have the right to set up on the discharger's property such devices as are necessary to conduct sampling inspection, compliance monitoring and/or metering operations. Where a discharger has security measures in force which would require proper identification and clearance before entry into their premises, the discharger shall make necessary arrangements so that upon presentation of suitable identification, personnel from the city, state and EPA will be permitted to enter, without delay, for the purposes of performing their specific responsibilities. (Ord. 2006-02 (part), 2006: Prior code § 4260)

13.08.640 Notification of violation.

If sampling performed by an industrial user indicates a violation, the industrial user must notify the city within twenty-four (24) hours of becoming aware of the violation. The industrial user shall also repeat the sampling and analysis and submit the results of such analysis to the city within thirty (30) days after becoming aware of the violation. The industrial user is not required to resample if the city performs monitoring at the facility at least once each month for the parameter in violation. (Ord. 2006-02 (part), 2006: Prior code § 4261)

13.08.650 Notification of the discharge of hazardous waste.

A. Any industrial user who commences the discharge of hazardous waste shall notify the city, the EPA Regional Waste Management Division Director and the state hazardous waste authorities in writing of any discharge into the city's wastewater collection and treatment system of a substance, which, if otherwise disposed of, would be a hazardous waste under 40 CFR Part 261. Such notification must include the name of the hazardous waste as set forth in 40 CFR Part 261, the EPA hazardous waste number, and the type of discharge (continuous, batch or other). If the industrial user discharges more than ten kilograms of such waste per calendar month, the notification shall also contain the following information to the extent such information is known and readily available to the industrial user: an identification of the hazardous constituents contained in the wastes, an estimation of the mass and concentration of such constituents in the wastestream discharged during that calendar month, and an estimation of the mass of the constituents in the wastestream expected to be discharged during the following twelve (12) months. All notifications must take place no later than ten days after the discharge commences. Notifications of changed discharges must be submitted in accordance with the provisions of this chapter. This notification requirement does not apply to pollutants reported under the requirements of discharge permits issued by the city.

B. In case of any new regulations under Section 3001 of the Resource Conservation and Recovery Act (RCRA) identifying additional characteristics of hazardous waste or listing any additional substances as a hazardous waste, the industrial discharger shall notify the city, the EPA Regional Waste Management Division Director and the state hazardous waste authorities of the discharge of such substance within ninety (90) days of the effective date of such regulations.

C. In the case of any notification made under this section, the industrial user shall certify that it has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined to be economically practical. (Ord. 2006-02 (part), 2006: Prior code § 4262)

13.08.655 Dental amalgam wastes.

A. No person shall discharge or cause to be discharged, any mercury or amalgam waste into the sewer system.

B. All dental practices discharging to the sewer system shall comply with the most recent Best Management Practices for Dental Amalgam Waste as published by the American Dental Association. (Ord. 2011-08 § 5, 2011)

13.08.660 Special agreements--Private facilities.

No statement contained in this article shall be construed as preventing any special agreement or arrangement between the city and any industrial discharger whereby an industrial waste of unusual strength or character may be proposed by the city for treatment, subject to payment therefore by the industrial discharger and subject to such terms and conditions as might be required by the city. However, no special agreement shall be allowed to contravene federal, state or local pretreatment standards. (Ord. 2006-02 (part), 2006: Prior code § 4263)

13.08.670 Special agreement--Public facilities.

No statement contained in this article shall be construed as preventing any special agreement or arrangement between the city and any other public corporation or entity, whereby the city undertakes to provide for the construction, acceptance, maintenance or operation of facilities for the collection, pumping or other means of transmission of sewage from the public agencies, pursuant to any appropriate legal authorization. However, no special agreement shall be allowed to contravene federal, state or local pretreatment standards. (Ord. 2006-02 (part), 2006: Prior code § 4264)

13.08.680 Federal requirements limitations.

Users in industrial categories subject to the categorical pretreatment standards development by the EPA under the Act are required to comply with pretreatment standards promulgated pursuant to Section 307. The city may issue standards more stringent than the federal standards if the director determines that the limitations in the federal standards are not sufficient to: (1) protect the operation of the city's treatment facilities, or (2) comply with water quality standards or effluent limitations specified in the city's national pollutant discharge elimination system (NPDES) permit. (Ord. 2006-02 (part), 2006: Ord. 2000-18 §§ 1 (part), 2 (part), 2000: prior code § 4265)

13.08.690 Regional water quality control board requirement limitations.

Source control of industrial discharges shall be accomplished by use of a permit and monitoring system as described herein. Discharge of industrial waste from any person within the city onto land or to any natural outlet may be permitted only if the discharge complies with all requirements of the regional water quality control board and of all other local, state and federal laws and regulations. (Ord. 2006-02 (part), 2006: Prior code § 4266)

13.08.700 Other governmental agency jurisdictions.

Nothing contained in this section shall be construed to limit any additional requirements that may be imposed by the county health officer, by the regional water quality control board, fish and game, or by other governmental agencies having jurisdiction thereof. (Ord. 2006-02 (part), 2006: Prior code § 4267)

Article 9. Permits and Fees

13.08.710 Permit required.

No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance or perform any work on any plumbing or drainage system under the jurisdiction of the city without first obtaining a written permit from the city. (Ord. 2006-02 (part), 2006: Prior code § 4270)

13.08.720 Application for permit.

Any person, legally entitled to apply for and receive a permit, shall make such application on forms provided by the city for that purpose. Applicant shall give a description of the character of the work proposed to be done and the location, ownership, occupancy and use of the premises in connection therewith. The city may require plans, specifications or drawings and such other information deemed necessary. If the city determines that the plans, specifications, drawings, descriptions or information furnished by the applicant are in compliance with the ordinances, rules and regulations of the city, the permit applied for shall be issued upon payment of the required fees as hereinafter fixed and/or as adopted by council resolution in implementation or modification hereof. (Ord. 2006-02 (part), 2006: Prior code § 4271)

13.08.730 Compliance with permit.

After approval of the application, evidenced by the issuance of a permit, no change shall be made in the location of the sewer, the grade, materials or other details from those described in the permit or as shown on the plans and specifications for which the permit was issued, except with written permission from an authorized representative of the city. (Ord. 2006-02 (part), 2006: Prior code § 4272)

13.08.740 Agreement.

The applicant's signature on an application for any permit, as set forth in Section13.08.720, shall constitute an agreement to comply with all of the provisions, terms and requirements of this and other applicable ordinances, rules and regulations of the city, and with the plans and specifications filed with the application, if any, together with such corrections or modifications as may be made or permitted by the city, if any. Such agreement shall be binding upon the applicant and may be altered

only upon a written request for the alteration from the applicant, approved by the city. (Ord. 2006-02 (part), 2006: Prior code § 4273)

13.08.750 Basic connection charge.

The city requires property developers, subdividers and individuals making connection to the city sanitary sewer system to pay a fee per connection.

A. Developers and subdividers shall pay to the city an amount, as set by resolution of the city council, for connection to the sanitary sewer system. Payment shall be made at such time as actual development is approved by the city.

B. At the time of connection to the city sewer system, residential property shall be assessed at an amount, as set by resolution of the city council, per lot for connection to the city sewer system, where such residential properties were not previously assessed on an acreage basis.

C. Properties, other than those for which connection has been requested by or required of a developer or individual, shall only be assessed at such time as connection is made to the city sewer system. Public bodies or such organizations as the city council may determine as nonprofit, and not land developers for profit, shall not be assessed until such time as connection is made to the city sewer system.

D. The city reserves to itself the right to assess additional fees for commercial or industrial properties where such additional fees are, in the opinion of the council, warranted by increased flows.

E. Fees established by the council are based upon the average costs of trunk sewers and oversize sewers paid for by the city in typical areas subject to service by the city. Review of the existing fees may be initiated by the council from time to time as necessary to meet increasing costs or changed conditions of providing trunk sewer or oversize service to areas being considered by the city for sanitary sewer service. Any revision of the fee schedule shall be approved by resolution adopted by the council.

F. The council is in no way committed to annexation of any particular area by virtue of the offer of the aforementioned fees by persons owning or developing areas proposed to be annexed to the city. The questions of annexation or of provision of a trunk sewer or oversize sewer to any area shall, in each instance, be resolved by the city council for the benefit of the city.

G. The above shall in no way abrogate any of the provisions of any other ordinance governing sewer service charges or fees currently in effect or hereafter adopted. (Ord. 2006-02 (part), 2006: Prior code § 4274)

13.08.755 Timing of fee payment.

A. Notwithstanding the requirements of Section13.08.750, the city council may, by resolution, authorize the payment of the fee at a time other than that identified in Section 13.08.750.

B. In adopting the resolution identified in subsection A of this section, the city council shall make the following findings:

1. That the state of the economy in the city is such that the deferment of the fee required by this chapter will stimulate the economy and enhance the provision of jobs; and

2. That the deferment of the fee required by this chapter will not materially affect the ability of the city to deliver its five year capital improvement program.

C. In adopting the resolution identified in subsection A of this section, the city council shall:

1. Identify the point in time at which the fee shall be paid; provided, that in no event shall the deferral be extended beyond the time of the final inspection or issuance of the certificate of occupancy, whichever occurs first;

2. Identify to which major land use category (i.e., residential, commercial, office and/or industrial) the resolution applies;

3. Identify whether or not a contract shall be entered into by and between the property owner, or lessee if the lessee's interest appears of record, and the city prior to the issuance of the building permit. If a contract is required to be executed, it shall be processed and recorded in accordance with Government Code Section 66007(c). In lieu of entering into a contract, if one is required, the feepayer may provide such other form of surety instrument guaranteeing payment of the fee as may be acceptable to the city engineer or his/her designee and the city attorney;

4. Impose a penalty, equal to one hundred (100) percent of the amount of the fees deferred, on any party who fails to pay the deferred fee by the point in time specified in such resolution; and

5. Provide that a party who fails to pay such deferred fees by the point in time specified in such resolution shall further forfeit the future right to defer such fees on parcels in which such party has a financial interest.

D. Companies classified within the following Standard Industrial Codes shall be able to pay their development impact fees over five years without interest or administrative fee. The first installment of twenty (20) percent shall be due upon occupancy and the balance shall be paid in five equal annual installments thereafter and shall be collected on the property tax roll. The collection of the balance due on the property tax roll shall not preclude the earlier payment of any outstanding balance.

2000--2099 Food processing

2200--3999 Certain other manufacturers

4200--4299 Trucking and warehousing

4500--4599 Air transportation

4700--5199 Transportation services and warehouse trade

E. Private companies located within the city limits with a permitted wastewater discharge capacity in excess of five hundred thousand (500,000) gallons per day may pay their sewer impact fees over ten (10) years. The first installment of ten (10) percent shall be due prior to occupancy, and the balance shall be paid in nine (9) equal annual installments thereafter. No interest shall accrue during the first five (5) years. Any balance remaining after the fifth year shall accrue interest at the rate of the city sewer connection services interest rate annually set by city council. All payments due after the initial payment shall be collected on the property tax roll. The collection of the balance due on the property tax roll shall not preclude the earlier payment of any outstanding balance. (Ord. 2012-13 § 2, 2013: Ord. 2006-02 (part), 2006: Ord. 9818 § 2, 1998)

13.08.760 Treatment connection charge.

A separate charge is established to recover capital costs for future use in the treatment facility from those for whom the capacity has been provided. Each new discharger who connects to the public sewer shall, prior to issuance of a permit, pay to the city a sum of money to be determined yearly by the city council, which sum shall represent repayment by that discharger for future capacity provided for dischargers use. The payment of this fee shall in no way affect that discharger's monthly sewer service charges or any other charges and fees established by this chapter. (Ord. 2006-02 (part), 2006: Prior code § 4275)

13.08.770 Timing of fee payment.

A. Notwithstanding the requirements of Section13.08.760, the city council may, by resolution, authorize the payment of the fee at a time other than that identified in Section 13.08.760.

B. In adopting the resolution identified in subsection A of this section the city council shall make the following findings:

1. That the state of the economy in the city is such that the deferment of the fee required by this article will stimulate the economy and enhance the provision of jobs; and

2. That the deferment of the fee required by this article will not materially effect the ability of the city to deliver is five year capital improvement program.

C. In adopting the resolution identified in subsection A of this section, the city council shall:

1. Identify the point in time at which the fee shall be paid; provided, that in no event shall the deferral be extended beyond the time of the final inspection or issuance of the certificate of occupancy, whichever occurs first;

2. Identify to which major land use category (i.e., residential, commercial, office and/or industrial) the resolution applies;

3. Identify whether or not a contract shall be entered into by and between the property owner, or lessee if the lessee's interest appears of record, and the city prior to the issuance of the building permit. If a contract is required to be executed, it shall be processed and recorded in accordance with Government Code Section 66007(c). In lieu of entering into a contract, if one is required, the fee payer may provide such other form of surety instrument guaranteeing payment of the fee as may be acceptable to the city engineer or his/her designee and the city attorney;

4. Impose a penalty, equal to one hundred (100) percent of the amount of the fees deferred, on any party who fails to pay the deferred fee by the point in time specified in such resolution; and

5. Provide that a party who fails to pay such deferred fees by the point in time specified in such resolution shall further forfeit the future right to defer such fees on parcels in which such party has a financial interest.

D. Companies classified within the following Standard Industrial Codes shall be able to pay their development impact fees over five years without interest or administrative fee. The first installment of twenty (20) percent shall be due upon occupancy and the balance shall be paid in five equal annual installments thereafter and shall be collected on the property tax roll. The collection of the balance due on the property tax roll shall not preclude the earlier payment of any outstanding balance.

2000--2099 Food processing

2200--3999 Certain other manufacturers

4200-4299 Trucking and warehousing

4500-4599 Air transportation

4700-5199 Transportation services and warehouse trade

E. Private companies located within the city limits with a permitted wastewater discharge capacity in excess of five hundred thousand (500,000) gallons per day may pay their sewer impact fees over ten (10) years. The first installment of ten (10) percent shall be due prior to occupancy, and the balance shall be paid in nine (9) equal annual installments

thereafter. No interest shall accrue during the first five (5) years. Any balance remaining after the fifth year shall accrue interest at the rate of the city sewer connection services interest rate annually set by city council. All payments due after the initial payment shall be collected on the property tax roll. The collection of the balance due on the property tax roll shall not preclude the earlier payment of any outstanding balance. (Ord. 2012-13 § 2, 2013: Ord. 2006-02 (part), 2006: Ord. 9818 § 3, 1998)

13.08.780 Special connection charges.

Whenever sewers serving a property have been previously constructed under the provisions of Article 5 of this chapter, cost recovery payments in accord with the procedures outlined in that article 5 shall be recovered prior to sewer connection permit issuance. (Ord. 2006-02 (part), 2006: Prior code § 4276)

13.08.790 Additional connection charges.

In addition to any other charges established herein, the city may establish additional connection charges for any sewer connection when, in the opinion of the city council, the circumstances of such connection necessitate the payment of charges over and above those established herein. (Ord. 2006-02 (part), 2006: Prior code § 4277)

13.08.800 Classes of permits.

Permit classes are as follows:

A. Building sewer permit;

B. Public sewer construction permit;

C. Private sewage disposal system permit;

D. Industrial discharge permit;

E. Nonsignificant discharge permit;

F. Special use sewer permit. (Ord. 2006-02 (part), 2006: Prior code § 4278)

13.08.810 Permits and inspection charges.

Permit and inspection charges and requirements shall be established by resolution of the city council as follows:

A. Building Sewer Permit. A lump sum fee as required by Section15.04.010, shall be paid to the city for inspecting the system from the end of the building drain to a public sewer or private sewage-disposal system.

B. Public Sewer Construction Permit. A fee as required by Section16.36.170 shall be paid to the city for inspecting the installation of sewer mains that shall become a public sewer.

C. Private Sewage Disposal System Permit. A fee as set by resolution of the city council for evaluating design adequacy and inspection of installation shall be paid to the city for the issuance of a permit for the construction of a new private sewage disposal system under the terms of Article 4 of this chapter. Should the installation be of excessive magnitude or complexity, the city may impose such additional charges as required to provide sufficient funds to cover all costs incurred by the city.

D. Industrial Discharge Permit. The permit fees shall be based on time, materials and analyses required to process the permit and shall be paid to the city for each industrial discharge permit.

1. Prior to consideration of any industrial discharge permit, each industrial user shall furnish the following information on forms to be provided by the city:

a. Name and address of applicant;

b. Volume of wastewater to be discharged;

c. Wastewater constituents and characteristics including but not limited to those mentioned in Section13.08.550;

d. Average and thirty (30) minute peak wastewater flow rates, including daily, monthly and seasonal variations, if any;

e. Site plans, floor plans, mechanical and plumbing plans and details showing all sewers and appurtenances by size, location and elevation;

f. Description of activities, facilities and plant processes on the premises including all types of materials which are or could be discharged;

g. Any other information deemed by the city to be necessary to evaluate the permit application.

2. The city shall evaluate the data furnished by the user and may require additional information. After evaluation and acceptance of the data furnished, the city may issue an industrial discharge permit subject to the terms and conditions provided herein.

3. Industrial discharge permits shall contain the following:

a. The unit charge or schedule of user charges and fees for the wastewater to be discharged to a community sewer;

b. The average and maximum allowable wastewater constituents and characteristics;

c. Limits on rate and time of discharge, or requirements for flow regulations and equalization;

d. Requirements for installation of inspection, metering, and sampling facilities;

e. Pretreatment requirements;

f. Specifications for monitoring programs which shall include sampling, number, types and standards for tests and reporting schedule. Sampling and pollutant analysis shall be performed in accordance with the procedures established under Section 304 (h) of the Act, detailed in 40 CFR 136;

g. i. Requirements for submission of technical reports or discharge reports, including but not limited to baseline monitoring reports, compliance schedule progress reports, ninety (90) day compliance reports, and periodic reports on continued compliance (see Sections 13.08.824 to 13.08.827 of this ordinance) as may be required from industrial users to assess compliance with federal, state and local limitations and standards with permit conditions, and, where applicable, with compliance schedule milestones or deadlines. In addition, all users shall submit to the city notices of potential problem discharges including slug loading;

ii. Reports submitted to the city by industrial users must be signed and certified by an authorized representative of the discharger. The name of such individual(s) shall be presented to the city for approval prior to issuance of any permit. A change in the authorized representative without prior notification to and approval by the city may result in rescission of the discharge permit. All baseline monitoring reports and other reports related to compliance with categorical pretreatment standard deadlines must contain a certification by a qualified professional, indicating whether or not pretreatment standards are being consistently met, and if any additional operation and maintenance and/or pretreatment is required to meet the applicable standards. The reports required pursuant to this Section are subject to the provisions of 18 U.S.C. 1001 relating to fraud and false statements and the provisions of Section 309(c)(2) of the Act governing false statements, representations or certifications in reports required under the Act.

h. Requirements for specific language in the certification by an authorized representative. Said certification shall state,

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

i. Requirements for maintaining plant records relating to wastewater discharge as specified by the city, and affording the city access thereto;

j. Mean and maximum mass emission rates, or other appropriate limits when incompatible pollutants, as defined by Section 13.08.040, are proposed or present in the user's wastewater discharge;

k. Other conditions as deemed appropriate by the city to ensure compliance with this chapter.

4. Industrial discharge permits shall be issued for a specified time period, not to exceed two years. It shall be the responsibility of permittee to initiate renewal within ninety (90) days prior to permit expiration. Any changes or new conditions in the permit shall include a reasonable time schedule for compliance.

5. Industrial discharge permits are issued to a specific discharger for a specific operation. If operational changes cause any new, increased or changed discharge, the city may rescind, condition or modify the discharger's industrial discharge permit. An industrial discharge permit shall not be reassigned or transferred or sold to a new owner, new discharger, different premises, or a new or changed operation without the prior approval of the city. Provided, that the city approves of such reassignment, transfer or sale of the permit, the permitted discharger shall provide a copy of the existing permit to the new owner or operator of the facility prior to completing the transaction.

6. Any discharger who violates the following conditions of the permit or of this chapter, or applicable state and federal regulations, is subject to having his permit revoked, after due notice and hearing by the city council.

a. Failure of a discharger to factually report the wastewater constituents and characteristics of his discharge;

b. Failure of the discharger to report significant changes in operations or wastewater constituents and characteristics;

c. Refusal of reasonable access to the discharger's premises for the purpose of inspection or monitoring;

d. Violation of conditions of the permit.

E. Nonsignificant Discharge Permit. The permit fees shall be based on time, material and analyses required to process the permit and shall be paid to the city for each nonsignificant discharge permit. Nonsignificant discharge permits shall be issued to certain small industries and some commercial users whose individual discharges do not significantly impact the treatment system, degrade receiving water quality, or contaminate sludge. Industries that have the potential to discharge a nondomestic or process wastestream, but at the present time discharge only sanitary waste, are also included in this group. this group also includes septage waste haulers.

1. Information similar to that required for an industrial discharge permit shall be required for a nonsignificant discharge permit, and shall be furnished on forms to be provided by the city;

2. Nonsignificant discharge permits may contain the same information as industrial discharge permits;

3. Nonsignificant discharge permits shall be issued for a specified time period, not to exceed four years;

4. Nonsignificant discharge permits are issued to a specific discharger for a specific operation, and shall not be reassigned, transferred or sold without the prior approval of the city;

5. Violators of the conditions of the nonsignificant discharge permit shall be subject to the same penalties as violators of the conditions of the industrial discharge permit.

F. Special Use Sewer Permit. Special use permits shall be required under the following circumstances:

1. Storm or drainage water discharge (Section 13.08.490);

2. Discharge of unpolluted waters (Section 13.08.500);

3. Direct discharge to sewer (Section 13.08.530);

4. Monitoring well discharge (Section 13.08.490).

Under any of the above circumstances, or any other special condition that may be determined by the city to warrant a permit, the applicant shall, prior to confirmation of such permit, pay a fee in an amount to be determined on an individual case basis by the city.

G. Reinspection Fee. A reinspection fee may be assessed for each inspection or reinspection when such portion of work for which inspection is called is not complete or when corrections called for are not made. (Ord. 2006-02 (part), 2006: Prior code § 4279)

13.08.815 Analytical requirements.

All pollutant analyses, including sampling techniques, to be submitted as part of a wastewater discharge permit application or report shall be performed in accordance with the techniques prescribed in 40 CFR Part 136, unless otherwise specified in an applicable categorical pretreatment standard. If 40 CFR Part 136 does not contain sampling or analytical techniques for the pollutant in question, sampling and analyses must be performed in accordance with procedures approved by EPA.

(Ord. 2006-02 (part), 2006)

13.08.816 Sample collection.

A. Except as indicated in Section B, below, the user must collect wastewater samples using flow proportional composite collection techniques. In the event flow proportional sampling is infeasible, the city may authorize the use of time proportional sampling or a minimum of four grab samples where the user demonstrates that this will provide a representative sample of the effluent being discharged. In addition, grab samples may be required to show compliance with instantaneous discharge limits.

B. Samples for oil and grease, temperature, pH, cyanide, phenols, sulfides, and volatile organic compounds must be obtained using grab collection techniques.

(Ord. 2006-02 (part), 2006)

13.08.820 Recordkeeping requirements.

Industrial users shall maintain records of all information resulting from monitoring activities. Records shall be kept for a time period consistent with the requirements of 40 CFR 403.12(h) but in no case for a period of less than three years. Such records shall be made available for inspection and upon demand by the city, state and/or EPA. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the industrial discharger or the operation of the city's pretreatment program or when requested by the state or the Environmental Protection Agency. (Ord. 2006-02 (part), 2006: Prior code § 4280)

Article 9A. Reporting Requirements

13.08.824 Baseline monitoring reports.

A. Within either one hundred eighty (180) days after the effective date of a categorical pretreatment standard, or the final administrative decision on a category determination under 40 CFR 403.6(a)(4), whichever is later, existing categorical users currently discharging to or scheduled to discharge to the POTW shall submit to the city a report which contains the information listed in paragraph B., below. At least ninety (90) days prior to commencement of their discharge, new sources, and sources that become categorical users subsequent to the promulgation of an applicable categorical standard, shall submit to the city a report which contains the information listed in paragraph B., below. A new source shall report the method of pretreatment it intends to use to meet applicable categorical standards. A new source also shall give estimates of its anticipated flow and quantity of pollutants to be discharged.

B. Users described above shall submit the information set forth below.

1. Identifying Information. The name and address of the facility, including the name of the operator and owner.

2. Environmental Permits. A list of any environmental control permits held by or for the facility.

3. Description of Operations. A brief description of the nature, average rate of production, and standard industrial classifications of the operation(s) carried out by such user. This description should include a schematic process diagram which indicates points of discharge to the POTW from the regulated processes.

4. Flow Measurement. Information showing the measured average daily and maximum daily flow, in gallons per day, to the POTW from regulated process streams and other streams, as necessary, to allow use of the combined wastestream formula set out in 40 CFR 403.6(e).

5. Measurement of Pollutants.

a. The categorical pretreatment standards applicable to each regulated process.

b. The results of sampling and analysis identifying the nature and concentration, and/or mass, where required by the standard or by the city, of regulated pollutants in the discharge from each regulated process. Instantaneous, daily maximum, and long-term average concentrations, or mass, where required, shall be reported. The sample shall be representative of daily operations and shall be analyzed in accordance with procedures set out in Section 13.08.815 of this ordinance.

c. Sampling must be performed in accordance with procedures set out in Section13.08.816 of this ordinance.

6. Certification. A statement, reviewed by the user's authorized representative and certified by a qualified professional, indicating whether pretreatment standards are being met on a consistent basis, and, if not, whether additional operation and maintenance (O&M) and/or additional pretreatment is required to meet the pretreatment standards and requirements.

7. Compliance Schedule. If additional pretreatment and/or O&M will be required to meet the pretreatment standards, the shortest schedule by which the user will provide such additional pretreatment and/or O&M. The completion date in this schedule shall not be later than the compliance date established for the applicable pretreatment standard. A compliance schedule pursuant to this section must meet the requirements set out in Section 13.08.825 of this ordinance.

8. Signature and Certification. All baseline monitoring reports must be signed and certified in accordance with Sections 13.08.810D.3.gii and 13.08.810D.3.h of this ordinance.

(Ord. 2006-02 (part), 2006)

13.08.825 Compliance schedule progress reports.

The following conditions shall apply to the compliance schedule required by Section13.08.824(B)(7) of this ordinance:

A. The schedule shall contain progress increments in the form of dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the user to meet the applicable pretreatment standards (such events include, but are not limited to, hiring an engineer, completing preliminary and final plans, executing contracts for major components, commencing and completing construction, and beginning and conducting routine operation);

B. No increment referred to above shall exceed nine months nor shall the total time period exceed the allotted time specified in the consent order or compliance order;

C. The user shall submit a progress report to the city no later than fourteen (14) days following each date in the schedule and the final date of compliance including, as a minimum, whether or not it complied with the increment of progress, the reason for any delay, and, if appropriate, the steps being taken by the user to return to the established schedule; and

D. In no event shall more than nine months elapse between such progress reports to the city.

(Ord. 2006-02 (part), 2006)

13.08.826 Report on compliance with categorical pretreatment standard deadline.

Within ninety (90) days following the date for final compliance with applicable categorical pretreatment standards, or in the case of a new source following commencement of the introduction of wastewater into the POTW, any user subject to such pretreatment standards and requirements shall submit to the city a report containing the information described in Section 13.08.824(B)(4-6) of this ordinance. For users subject to equivalent mass or concentration limits established in accordance with the procedures in 40 CFR 403.6(c), this report shall contain a reasonable measure of the user's long-term production rate. For all other users subject to categorical pretreatment standards expressed in terms of allowable pollutant discharge per unit of production (or other measure of operation), this report shall include the user's actual production during the appropriate sampling period. All compliance reports must be signed and certified in accordance with Sections 13.08.810D.3.gii and 13.08.810D.3.h of this ordinance.

(Ord. 2006-02 (part), 2006)

13.08.827 Periodic compliance reports.

A. All significant industrial users shall, at a frequency determined by the city but in no case less than twice per year (in June and December), submit a report indicating the nature and concentration of pollutants in the discharge which are limited

by pretreatment standards and the measured or estimated average and maximum daily flows for the reporting period. All periodic compliance reports must be signed and certified in accordance with Section 13.08.810D.3.h of this ordinance.

B. All wastewater samples must be representative of the user's discharge. Wastewater monitoring and flow measurement facilities shall be properly operated, kept clean, and maintained in good working order at all times. The failure of a user to keep its monitoring facility in good working order shall not be grounds for the user to claim that sample results are unrepresentative of its discharge.

C. If a user subject to the reporting requirement in this section monitors any pollutant more frequently than required by the city, using the procedures prescribed in Section 13.08.816 of this ordinance, the results of this monitoring shall be included in the report.

(Ord. 2006-02 (part), 2006)

Article 10. Sewer Service Charges

13.08.830 Purpose and basis.

Sewer service charges as set forth in this chapter are established to assure that each recipient of waste treatment services within the city sewer service area shall pay its proportionate share of the costs of all waste treatment service provided by the city. The system of charges to be established must, in accordance with the requirements of the federal act and the state Clean Water Grant Program, provide for the following items:

A. Sufficient financing for an adequate operation and maintenance program; including competent operating personnel.

B. Funds to be reserved for necessary future replacements, improvements, and expansions of the facilities. (Ord. 2006-02 (part), 2006: Prior code § 4285)

13.08.840 Setting of rates.

Specific dollar amounts for sewer service charges for each user classification shall be established by resolution of the city council on a yearly basis following the federally required annual revision of the city's revenue program, with any required adjustments to be effective as set by resolution of the city council. (Ord. 2006-02 (part), 2006: Prior code § 4286)

13.08.850 Discharge classification.

The following basis shall be utilized for the establishment of sewer service charges:

A. Residential (single-family, multiple dwellings, and mobile home parks). Each residential unit shall pay a flat rate per month for each dwelling unit.

B. Commercial and institutional (excluding such commercial establishments as are determined by the director to produce wastewaters with a higher BOD or suspended solids content than Visalia domestic wastewater or to possess other characteristics requiring additional treatment costs). Each licensed business, institutional, and commercial establishment (including businesses and professional offices, motels, schools and hospitals) shall pay in accordance with the rate schedule as set by resolution of the city council.

C. Industrial (including high-strength or additional treatment requirement commercial dischargers as described in subsection (B) of this section).

1. All significant industrial and commercial sources shall be charged on the basis of set amounts for each million gallons of wastewater flow, each pound of BOD, and each pound of suspended solids discharged by individual users per month, in accordance with a rate schedule set by resolution of the city council. Measurement of BOD and suspended solids shall be performed by the city or by a laboratory approved by the city; the frequency and number of tests for each characteristic to be determined by the director. All such testing shall be at the expense of the expense of the discharger;

2. All industrial sources determined by the director not to be significant dischargers shall be charged a flat rate per month based on the quantity and strength of their wastewater as determined by the director, in general accordance with the rate schedule for subsection (C)(1) of this section set by resolution of the city council. (Ord. 2006-02 (part), 2006: Prior code § 4287)

13.08.860 Flow measurement.

Flow measurements for rate purposes shall be based upon one hundred (100) percent of daily metered water consumption if all water used is supplied by a public utility company. Otherwise, the amount of sewer usage shall be determined by the director in accordance with the provisions of this chapter. If, in the opinion of the director or the opinion of the discharger, it is necessary to install metering devices in order to accurately determine the sewer usage, such metering devices shall be installed, when directed by the city, at the discharger's cost, and the specifications therefor shall be approved by the city. Flow measurements shall be made at regular intervals or continuously recorded as determined necessary by the city and billings shall be adjusted appropriately. (Ord. 2006-02 (part), 2006: Prior code § 4288)

13.08.870 Collection.

A. Billing for sewer service for those dischargers governed by Section 13.08.850(A) and 13.08.850(B), and payment

thereof shall be to and by the person in whose name water service is rendered to the property, or the owner of the property on written application. In the case of a residence or commercial establishment using well water, the owner of the property is responsible for sewer service charges. The date charges begin to accrue for sewer service is the earliest of the date water billing is started or the date customer requests service. In the case of a residence or commercial establishment using well water, the date charges begin to accrue for sewer service is the date of occupancy, title change, or annexation. The date charges for service end is the later of the date the water service and/or sewer service is terminated, or the date customer requests to end services.

B. The sewer service charges for dischargers governed by Section 13.08.850(C) shall be paid every month on the basis of measured flow, BOD and suspended solids for the previous month, as billed by the city to the discharger.

C. All service charges shall be retained by the city irrespective of any intra-billing termination date of sewer service, to defer service and administrative costs. Upon written application by the property owner of tenant-occupied property, billing and payment may be to and by such property owner where the refuse service charge is similarly billed and paid. (Ord. 2014-01 § 1 (part), 2014; Ord. 2011-08 § 6, 2011: Ord. 2006-02 (part), 2006: Ord. 2000-18 §§ 1 (part), 2 (part), 2000: prior code § 4289)

13.08.880 Late charges.

A. In the event that dischargers described in Sections 13.08.850(A) and 13.08.850(B) shall fail to pay any billing within fifteen (15) days from the bill date, a late charge as set by resolution of the city council for each such billing month may be added to the bill, and the city may have no authority to accept any payment thereafter without collecting the late charge. This charge shall be collected to defray the cost of billing and bookkeeping involved in late payments.

B. For each industrial sewer service charge, as defined in Section 13.08.850(C), remaining unpaid more than fifteen (15) days from the bill date there may be added and collected therewith a late charge as set by resolution of the city council and any such unpaid charge, together with the late charge shall bear interest at the rate as set by resolution of the city council until paid.

C. In the event that the discharger shall fail to pay any charge herein provided by the 15th of the third month following presentation of the bill for such charge to the discharger, the city may, in addition to any other remedies it may have, after due notice in writing, discontinue furnishing sewer service and not resume the same until all delinquent charges hereunder, together with any costs necessitated by the discontinuance and resumption of sewer service, have been fully paid. Any such notice of disconnection or discontinuance of service shall include the name, address, and telephone number of the city division authorized to discuss, and correct where appropriate, any outstanding charges.

D. In addition or in the alternative, and at the option of the city, the city may file a civil action for the collection of any amounts due and unpaid. This remedy shall be cumulative and in addition to the remedy of means of enforcing payment of the sum required to be paid by this chapter stated in subsection (A), (B), (C), (E), (F), (G) or (H) of this section.

E. As an alternate means of collection of amounts due and unpaid at owner-occupied property:

1. Once a year the city council may cause to be prepared a report of delinquent fees including late charges. The council shall fix a time, date and place for hearing the report and any objections or protests thereto;

2. The council shall cause notice of the hearing to be mailed to the landowners listed on the report not less than ten days prior to the date of the hearing;

3. At the hearing the council shall hear any objections or protests of landowners liable to be assessed for delinquent fees including late charges. The council may make such revisions or corrections to the report as it deems just, after which, by resolution, the report shall be confirmed;

4. The delinquent fees set forth in the report as confirmed shall constitute special assessments against the respective parcels of land and are a lien on the property for the amount of such delinquent fees. A certified copy of the confirmed report shall be filed with the county auditor for the amounts of the respective assessments against the respective parcels of land as they appear on the current assessment roll. The lien is created, and attaches upon recordation, in the office of the county recorder of the county in which the property is situated, of a certified copy of the resolution of confirmation. The assessment may be collected at the same time and in the same manner as ordinary county ad valorem property taxes are collected and shall be subject to the same penalties and the same procedure and sale in case of delinquency as provided for such taxes. All laws applicable to the levy, collection and enforcement of county ad valorem property taxes shall be applicable to such assessment, except that if any real property to which such lien would attach has been transferred or conveyed to a bona fide purchaser for value, or if a lien of a bona fide encumbrancer for value has been created and attached thereon, prior to the date on which the first installment of such taxes would become delinquent, then the lien which would otherwise be imposed by this section shall not attach to such real property and the delinquent fees, as confirmed, relating to such property shall be transferred to the unsecured roll for collection and recorded in the name of the prior property owner following city policies and procedures.

5. The city may, in its discretion, issue separate bills for such special assessment taxes and separate receipts for collection on account of such assessment.

F. At the time the fees become delinquent, until such time as they are fully paid, the delinquent account balance, including late charges, shall constitute an unrecorded lien against the property, and, as such, may be identified during a title search. For commercial businesses, delinquent account balances, including late charges, may be considered an unrecorded

lien against the business name and/or owner of the business.

G. In addition to, or in lieu of other collection processes, the city may authorize a third party to discontinue water service as a means of collecting delinquent balances.

H. In addition to, or in lieu of other collection processes, delinquent balances may be processed through a collection bureau. (Ord. 2014-01 § 1 (part), 2014; Ord. 2011-08 § 7, 2011: Ord. 2006-02 (part), 2006: Ord. 2000-18 §§ 1 (part), 2 (part), 2000: prior code § 4290)

13.08.890 Application.

In the event there are any inequities that arise because of the nature of certain business, commercial accommodations or units under this article, the director shall have the authority to establish any variances in applying this article to alleviate such inequities. Any requirements for pretreatment to bring materials discharged to a sewer to a condition where they may be handled by the sewage system of the city, shall not be cause for a reduction of the rates and charges outlined herein. (Ord. 2006-02 (part), 2006: Prior code § 4291)

Article 11. Administration and Enforcement

13.08.900 Violation unlawful.

A. Following the effective date of this chapter, it shall be unlawful for any person to violate any provision of this chapter, to connect to, construct, install or provide, maintain, use or alter any other means of sewage disposal from any building in said city except by connection to a public sewer in the manner as provided in this chapter, or by installation, provision, usage or maintenance of approved private disposal facilities in accordance with the provisions of this chapter.

B. When the city finds that a user has violated, or continues to violate, any provision of this ordinance, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the city may fine such user in at least the amount of one thousand dollars ($1000.00) per day. Such fines shall be assessed on a per violation, per day basis. In the case of monthly or other long term average discharge limits, fines shall be assessed for each day during the period of violation.

C. Unless otherwise specified in this chapter, any violation of the provisions of subsection (A) of this section shall constitute a misdemeanor. Notwithstanding the classification of a violation of this chapter as a misdemeanor, at the time an action is commenced to enforce the provisions of this chapter, the trial court, upon recommendation of the prosecuting attorney, may reduce the charged offense from a misdemeanor to an infraction pursuant to Section 19(c) of the California Penal Code.

D. Any person convicted of a misdemeanor under this article shall be punished by: (1) A fine not to exceed five hundred dollars ($500.00) and/or thirty (30) days in the county jail for a first violation; (2) a fine not exceeding one thousand dollars ($1,000.00) and/or ninety (90) days in the county jail for a second violation of this article within one year; and (3) a fine not exceeding two thousand five hundred dollars ($2,500.00) and/or six months in the county jail for each additional violation of this article within one year. Each day that a violation continues shall be regarded as a new and separate offense.

E. Any person convicted of any infraction of this article shall be punished by: (1) a fine not exceeding fifty dollars ($50.00) for a first violation; (2) a fine not exceeding one hundred dollars ($100.00) for the second violation of this article within one year; and (3) a fine not exceeding two hundred fifty dollars ($250.00) for each additional violation of this article within one year. Each day a violation continues shall be regarded as a new and separate offense. (Ord. 2006-02 (part), 2006: Prior code § 4295)

13.08.910 Inspection and sampling.

The city may inspect the facilities of any discharger to ascertain whether the purpose of this chapter is being met and all requirements are being complied with. Owners and/or occupants of premises where wastewater is created or discharged shall allow city representatives ready access at all reasonable times to all parts of the premises for the purposes of inspection or sampling or in the performance of any of their duties. The city shall have the right to set up on the discharger's property such devices as are necessary to conduct sampling or metering operations. Where a discharger has security measures in force which would require proper identification and clearance before entry into their premises, the discharger shall make necessary arrangements with security guards so that, upon presentation of suitable identification, personnel from the city shall be permitted to enter without delay for the purposes of performing their specific responsibilities. The purposes of such inspection may include, but are not limited to:

A. Determination of the size, depth and location of any sewer or storm drain connection;

B. Determination of the outlet of any sewer or storm drain connection by depositing testing materials in any plumbing fixture attached thereto and flushing the same, if necessary;

C. Determination by measurements and samples of the quantity and nature of sewage or wastewater being discharged into any sewer, storm drain or water course;

D. Inspection testings and sampling of the discharge of any device used to prevent the discharge into any sewer, storm drain, or water course of illegal waste or illegal quantities of waste, such as floor drains, traps or other clarifiers, also, of those devices used to grind, shred, pulverize, or otherwise treat garbage or industrial waste before discharging same into a

sewer or storm drain;

E. Determination of the location of roof, swimming pool and surface drains, and whether they are connected to a street gutter, storm drain or sewer;

F. Determination of the nature and quantity of flow in any open water course or storm drain;

G. Inspection and copying of records of monitoring activities and results. (Ord. 2006-02 (part), 2006: Prior code § 4296)

13.08.920 Notice and correction.

A. Any person found to be violating, with respect to violations other than sewer service charge delinquencies, any provision of this or any other ordinance, rule or regulation of the city shall be served by the city with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations.

B. All persons shall be held responsible for any and all damages resulting from the acts of agents or employees. Upon being notified by the city of any violation of this chapter, the person or persons having charge of said work or facilities shall correct the same, within the stipulated time limit, at such person or persons' expense. (Ord. 2006-02 (part), 2006: Prior code § 4297)

13.08.925 Consent orders.

The city may enter into consent orders, assurances of voluntary compliance, or other similar documents establishing an agreement with any user responsible for noncompliance. Such documents will include specific action to be taken by the user to correct the noncompliance within a time period specified by the document. Such documents shall have the same force and effect as the administrative orders issued pursuant to Sections 13.08.930 and 13.08.980 of this ordinance and shall be judicially enforceable.

(Ord. 2006-02 (part), 2006)

13.08.930 Compliance orders.

When the city finds that a user has violated, or continues to violate, any provision of this ordinance, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the city may issue an order to the user responsible for the discharge directing that the user come into compliance within a specified time. If the user does not come into compliance within the time provided, sewer service may be discontinued unless adequate treatment facilities, devices, or other related appurtenances are installed and properly operated. Compliance orders also may contain other requirements to address the noncompliance, including additional self-monitoring and management practices designed to minimize the amount of pollutants discharged to the sewer. A compliance order shall not extend the deadline for compliance established for a pretreatment standard or requirement, nor does a compliance order relieve the user of liability for any violation, including any continuing violation. Issuance of a compliance order shall not be a bar against, or a prerequisite for, taking any other action against the user.

(Ord. 2006-02 (part), 2006)

13.08.935 Public nuisance.

Continued habitation of any building or continued operation of any industrial facility in violation of the provisions of this chapter, other than those provisions involving sewer service charge delinquencies, is declared to be a public nuisance. The city may cause proceedings to be brought for the abatement of the occupancy of the building or industrial facility during the period of such violation. (Ord. 2006-02 (part), 2006: Prior code § 4298)

13.08.940 Disconnection.

As an alternative method of enforcing the provisions of this chapter, the city shall have the power to disconnect a discharger from the sewer mains of the city five days after written notice, by certified mail, thereof. Upon disconnection, the city shall estimate the cost of disconnection from and reconnection to the system, and the discharger shall deposit the cost, as estimated, of disconnection and reconnection before such discharger connection is reconnected to the system. The city shall refund any part of the deposit remaining after payment of all costs of disconnection and reconnection. (Ord. 2006-02 (part), 2006: Prior code § 4299)

13.08.950 Public nuisance--Abatement.

During the period of any disconnection, habitation of such premises by human beings shall constitute a public nuisance, whereupon the city may cause proceedings to be brought for the abatement of the occupancy of said premises by human beings during the period of such disconnection. In such event, and as a condition of reconnection, there is to be paid to the city a reasonable attorney's fee and cost of suit arising in said action. (Ord. 2006-02 (part), 2006: Prior code § 4300)

13.08.960 Means of enforcement only.

The city declares that Sections 13.08.880 through 13.08.950 are established only as a means of enforcement of the terms and conditions of this chapter and not as a penalty. (Ord. 2006-02 (part), 2006: Prior code § 4301)

13.08.970 Accidental discharge/slug control plan.

A. The city may require any industrial user to develop and implement an accidental discharge/slug control plan. At least once every two years, the city shall evaluate each significant industrial discharger and determine whether or not such a plan will be required. Any industrial user required to develop and implement an accidental discharge/slug control plan shall submit a plan which addresses, at a minimum, the following:

1. Description of discharge practices, including non-routine batch discharges;

2. Description of stored chemicals;

3. Procedures for immediately notifying the city of any accidental or slug discharge. Such notification must also be given for any discharge of substances prohibited by the city;

4. Procedures to prevent adverse impact from any accidental or slug discharge. Such procedures include, but are not limited to, inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants, and/or measures and equipment for emergency response.

B. Notification of Discharge. Significant industrial and commercial dischargers shall notify the city immediately upon accidentally discharging wastes in violation of this chapter, to enable countermeasures to be taken by the city to minimize damage to the community sewer, treatment facility, treatment processes and the receiving waters. This notification shall be followed, within seven days of the date of occurrence, by a detailed written statement describing the causes of the accidental discharge and the measures being taken to prevent future occurrence. Such notification shall not relieve dischargers of liability for any expense, loss or damage to the sewer system, treatment plant, or treatment process, or for any fines imposed on the city on account thereof under Section 13350 of the California Water Code or for violations of Section 5650 of the California Fish and Game Code.

C. Notices to Employees. In order that employees of significant industrial dischargers be informed of city requirements, such dischargers shall make available to their employees copies of this chapter, together with such other wastewater information and notices which may be furnished by the city from time to time directed toward more effective water pollution control. A notice shall be furnished and permanently posted on the discharger's bulletin board advising employees whom to call in case of an accidental discharge or violation of this chapter.

D. Preventive Measures. Any direct or indirect connection or entry point for accidental discharge of deleterious wastes to the discharger's plumbing or drainage system should be eliminated. Where such action is impractical or unreasonable, the discharger shall appropriately label such entry points to warn against discharge of such wastes in violation of this chapter. (Ord. 2006-02 (part), 2006: Prior code § 4302)

13.08.980 Issuance of cease and desist orders.

When the city finds that a discharge of wastewater has taken place, in violation of prohibitions or limitations of this chapter, or the provisions of an industrial discharge permit, the city may issue an order to cease and desist and direct that those persons not complying with such prohibitions, limitations, or provisions:

A. Comply forthwith;

B. Comply in accordance with a time schedule set forth by the city;

C. Take appropriate remedial or preventive action in the event of a threatened violation. (Ord. 2006-02 (part), 2006: Prior code § 4303)

13.08.990 Show cause hearing.

The city may order a user which has violated, or continues to violate, any provision of this ordinance, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, to appear before the city and show cause why the proposed enforcement action should not be taken. Notice shall be served on the user specifying the time and place for the meeting, the proposed enforcement action, the reasons for such action, and a request that the user show cause why the proposed enforcement action should not be taken. The notice of the meeting shall be served personally or by registered or certified mail (return receipt requested) at least seven days prior to the hearing. Such notice may be served on any authorized representative of the user. A show cause hearing shall not be a bar against, or prerequisite for, taking any other action against the user.

(Ord. 2006-02 (part), 2006)

13.08.995 Submission of time schedule.

When the city finds that a discharge of wastewater has been taking place, in violation of prohibitions or limitations prescribed in this chapter, or the provisions of an industrial discharge permit, the city may require the discharger to submit for approval, with such modifications as it deems necessary, a detailed time schedule of specific actions which the discharger shall take in order to prevent or correct the violation. (Ord. 2006-02 (part), 2006: Prior code § 4304)

13.08.1000 Appeals.

Any discharger, permit applicant, or permit holder affected by any decision, action, or determination made by the director, interpreting or implementing the provisions of this chapter or any permit issued hereunder by the city, may file with the city manager a written request for reconsideration within ten days of such decision, action, or determination, setting forth in detail the facts supporting the discharger's request for reconsideration. The city manager has the discretion to refer any and all appeals to a designated administrative hearing officer for determination. (Ord. 2006-02 (part), 2006: Ord. 2000-18 §§ 1 (part), 2 (part), 2000: prior code § 4305)

13.08.1010 City council appeal.

Appeal decisions made by the city manager, or an administrative hearing officer designated by the city manager, may be appealed to the city council. City council decisions shall be final. (Ord. 2006-02 (part), 2006: Prior code § 4306)

13.08.1020 Injunction.

Whenever a discharge of wastewater is in violation of the provisions of this chapter or otherwise causes or threatens to cause a condition of contamination, pollution or nuisance, or whenever any person violates permit conditions and/or applicable pretreatment standards, the city may petition the superior court for the issuance of a preliminary or permanent injunction or both, as may be appropriate, in restraining the continuance of such discharge. (Ord. 2006-02 (part), 2006: Prior code § 4307)

13.08.1030 Liability.

Any person, firm or corporation, or any partner, officer, agent or employee thereof who deposits or permits to be deposited into the city's sewer system or any facilities tributary thereto any wastes other than those permissible under the terms of the ordinance and the terms of the valid permit granted thereunder, shall be liable for any and all damage caused to the city by virtue of such act, including compensation for damage to the city's facilities and all costs of any legal fees, suits, or judgments against the city which may be attributable to such wastes so discharged. (Ord. 2006-02 (part), 2006: Prior code § 4308)

13.08.1035 Administrative fines.

A. When the city finds that a user has violated, or continues to violate, any provision of this ordinance, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the city may fine such user. Such fines shall be assessed on a per violation, per day basis. In the case of monthly or other long term average discharge limits, fines shall be assessed for each day during the period of violation. The administrative penalty assessed per this section shall be one hundred dollars ($100.00) for the first violation; two hundred dollars ($200.00) for the second violation of the same ordinance within one year; and five hundred dollars ($500.00) for each additional violation of the same ordinance within one year. In the alternative, an alternative administrative penalty requested by the Director of Public Works and approved by a resolution of the Visalia City Council may be utilized pursuant to Section 1.13.050(D).

B. Payment of any penalty shall not excuse the failure to correct the violation(s), nor shall it bar further enforcement action by the city.

C. Unpaid charges, fines, and penalties shall, after thirty (30) calendar days, be assessed an additional penalty of ten percent (10%) of the unpaid balance, and interest shall accrue thereafter at a rate of ten percent (10%) per month. A lien against the user's property will be sought for unpaid charges, fines, and penalties.

D. Users desiring to dispute such fines must file a written request for the city to reconsider the fine along with full payment of the fine amount within thirty (30) days of being notified of the fine. Where a request has merit, the city may convene a hearing on the matter. In the event the user's appeal is successful, the payment, together with any interest accruing thereto, shall be returned to the user. The city may add the costs of preparing administrative enforcement actions, such as notices and orders, to the fine.

E. Issuance of an administrative fine shall not be a bar against, or a prerequisite for, taking any other action against the user.

F. Revocation of Permit. In the event a discharger shall fail to make arrangements for corrective actions or to pay penalties, as required herein, and shall not have appealed as provided within the time allowed, then the director shall order such discharger's permit immediately suspended, and take such action as necessary to ensure that the discharger complies with the provisions of this section, including but not limited to physically blocking the discharger's access to the sewer system. All such measures shall remain in effect until the discharger has complied with the provisions of this section. (Ord. 2011-08 § 8, 2011: Ord. 2006-02 (part), 2006)

13.08.1040 Civil penalties.

Notwithstanding the provisions of Section13.08.900:

A. The city may impose civil penalties upon any discharger who violates any provision of this chapter. Civil penalties shall be in accordance with Section 1.12.010. The purpose for issuing civil penalties under this section is to penalize negligent or willful misconduct, discourage future violations from occurring, encouraging corrective actions and punishing repeat violators.

B. A user who has violated, or continues to violate, any provision of this ordinance, a wastewater discharge permit, or

order issued hereunder, or any other pretreatment standard or requirement shall be liable to the city in at least the amount of one thousand dollars ($1,000.00) per violation, per day. In the case of a monthly or other long-term average discharge limit, penalties shall accrue for each day during the period of the violation.

C. The city may recover reasonable attorneys' fees, court costs, and other expenses associated with enforcement activities, including sampling and monitoring expenses, and the cost of any actual damages incurred by the city.

D. In determining the amount of civil liability, the court shall take into account all relevant circumstances, including, but not limited to, the extent of harm caused by violation, the magnitude and duration of the violation, any economic benefit gained through the user's violation, corrective actions by the user, the compliance history of the user, and any other factor as justice requires.

E. Filing a suit for civil penalties shall not be a bar against, or a prerequisite for, taking any other action against a user.

F. Notice of Violation. Upon the director's determination that a chargeable violation has occurred, he shall issue to and serve upon, the discharger a notice of violation(s). Such notice shall describe the time, date, place and circumstances of each violation charged, the amount of penalty imposed by the director for each violation, and corrective measures which the discharger is required to undertake as a condition of continuation of discharger's permit. The director shall have discretionary authority to decline to issue notice of violation(s) in cases where violations are insignificantly technical in nature and the public interest would not be served by formal charges. The director shall keep a record of all such discretionary determinations.

G. Discharger Payment or Appeal. Discharger shall pay the penalty and take corrective action described in the notice of violation, or shall make arrangements to pay and take corrective actions. Payment shall be made, or a plan for payment and corrective action shall be made and completed not later than thirty (30) days after service upon the discharge of the notice of violation. Discharger may, in the alternative, within thirty (30) days of service of the notice of violation, file a notice of appeal with the city manager, which notice of appeal shall stay all further action on the notice of violation, and accumulation of interest upon penalties therein, pending final decision by the city manager on the appeal; provided, however, that nothing herein shall be taken to limit the authority of the director to take such action or to make such directives as are reasonable in the circumstances to stop or prevent an ongoing or threatened violation.

H. Revocation of Permit. In the event a discharger shall fail to make arrangements for corrective actions or to pay penalties, as required herein, and shall not have appealed as provided within the time allowed, then the director shall order such discharger's permit immediately suspended, and take such action as necessary to ensure that the discharger complies with the provisions of this section, including but not limited to physically blocking the discharger's access to the sewer system. All such measures shall remain in effect until the discharger has complied with the provisions of this section.

I. City Manager's Authority. Upon an appeal brought to the city manager by a notice of appeal by a discharger charged with the violation, the city manager shall set the matter for hearing. Alternatively, the city manager may refer such appeals to a designated administrative hearing officer. The city manager, or the administrative hearing officer shall determine whether the violation has occurred, and whether the civil penalty imposed by the director was reasonable in all the circumstances. The city manager, or the administrative hearing officer designated by the city manager, shall have the authority and set proceedings to affirm or dismiss the allegations, to condition the penalties imposed or the corrective action, or to reduce or increase the fines imposed by the director. Failure of the discharger to comply with the decision of the city manager or the administrative hearing officer designated by the city manager, or make arrangements for compliance satisfactory to the director within fifteen (15) days of the date of the decision, shall result in termination of the discharger's permit, and the director shall thereupon order physical termination of service forthwith, which service shall not be resumed until the order of the city manager or the administrative hearing officer designated by the city manager, has been complied with.

J. Lien. The amount of civil penalties imposed under this section which have remained delinquent for a period of sixty (60) days shall constitute a lien against the real property of the discharger from which the discharge originated resulting in the imposition of the civil penalty. The lien provided herein shall have no force and effect until recorded with the county recorder and when recorded shall be in force and effect for ten years from time of recording unless sooner released, and shall be renewable in accordance with the provisions of Sections 683.110 to 683.220, inclusive, of the Code of Civil Procedure.

K. Superior Court Action. The city may, at its option, elect to petition the superior court to confirm any other establishing civil penalties and enter judgment in conformity therewith in accordance with the provisions of Sections 1285 to 1297.6, inclusive, of the Code of Civil Procedure. (Ord. 2006-02 (part), 2006: Ord. 9605 § 26 (part), 1996: Prior code §4309)

13.08.1050 Criminal penalties for certain violations.

Notwithstanding the provisions of Section 13.08.900:

A. A discharger who willfully or negligently violates any provisions of this ordinance, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement shall, upon conviction, be guilty of a misdemeanor, punishable by a fine in at least the amount of one thousand dollars ($1,000.00) per violation, per day, or subject to penalties in accordance with Section 1.12.010. (Ord. 2006-2 (part), 2006: Ord. 9605 § 26 (part), 1996: Prior code § 4310).

B. A discharger who willfully or negligently introduces any substance into the POTW which causes personal injury or property damage shall, upon conviction, be guilty of a misdemeanor, and be subject to a penalty in at least the amount of one thousand dollars ($1,000.00) per violation, per day or be subject to penalties in accordance with Section 1.12.010 This penalty shall be in addition to any other cause of action for personal injury or property damage available under state law.

(Ord. 2006-02 (part), 2006: Ord. 9605 § 26 (part) 1996: Prior code § 4310).

13.08.1060 Penalties for significant noncompliance.

Notwithstanding civil or criminal penalties, any industrial user found to be in significant noncompliance with applicable pretreatment requirements during the previous twelve (12) months shall be included in an annual public notification in the largest daily newspaper published in the city. (Ord. 2006-02 (part), 2006: Prior code § 4311)

13.08.1070 Falsifying of information.

Any person or persons who knowingly makes any false statements, representation, record, report, plan or other document filed with the city or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or procedure required under this chapter, shall be guilty of a violation of this chapter. (Ord. 2006-02 (part), 2006: Prior code § 4312)

13.08.1075 Emergency suspensions.

The city may immediately suspend a user's discharge, after informal notice to the user, whenever such suspension is necessary to stop an actual or threatened discharge which reasonably appears to present or cause an imminent or substantial endangerment to the health or welfare or persons. The city may also immediately suspend a user's discharge, after notice and opportunity to respond, that threatens to interfere with the operation of the POTW, or which presents, or may present, an endangerment to the environment.

A. Any user notified of a suspension of its discharge shall immediately stop or eliminate its contribution. In the event of a user's failure to immediately comply voluntarily with the suspension order, the city may take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the POTW, it's receiving stream, or endangerment to any individuals. The city may allow the user to recommence its discharge when the user has demonstrated to the satisfaction of the city that the period of endangerment has passed, unless the termination proceedings in Section 13.08.1080 of this ordinance are initiated against the user.

B. A user that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a detailed written statement, describing the causes of the harmful contribution and the measures taken to prevent any future occurrence, to the city prior to the date of any termination hearing under Section 13.08.1080 of this ordinance.

Nothing in this section shall be interpreted as requiring a hearing prior to any emergency suspension under this section. (Ord. 2006-02 (part), 2006)

13.08.1080 Termination of service.

The city may revoke any industrial discharge permit, or immediately terminate, or cause to be immediately terminated, wastewater service to any premises if a violation of any provision of this chapter causes or threatens to cause a condition of contamination, pollution, or nuisance as defined in this chapter. (Ord. 2006-02 (part), 2006: Prior code § 4313)

Article 12. Special Regulations

13.08.1090 Protection from damage.

No unauthorized person shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is part of the city sewerage system. (Ord. 2006-02 (part), 2006: Prior code § 4316)

13.08.1100 Confidential information.

All information and data regarding a discharger obtained from reports, questionnaires, permit applications, permits or monitoring programs, and from inspections, shall be available to the public or other governmental agency without restriction unless the discharger specifically requests and is able to demonstrate to the satisfaction of the city that the release of such information would divulge information, processes or methods which would be detrimental to the discharger's competitive position. When requested by the person furnishing a report, the portions of a report which might disclose trade secrets or secret processes shall not be made available for inspection by the public, but shall be made available to governmental agencies for use in making studies and shall be available for use by the state or any state agency in judicial review or enforcement proceedings involving the person furnishing the report. Wastewater constituents and characteristics shall not be recognized as confidential information. (Ord. 2006-02 (part), 2006: Prior code § 4317)

13.08.1110 Special agreements.

Special agreements and arrangements between the city and any persons or agencies regarding wastewater treatment and sewerage facilities may be entered into when in the opinion of the city unusual or extraordinary circumstances compel special terms and conditions. However, no special agreements between the city and any user shall be allowed to contravene federal, state or local pretreatment standards. (Ord. 2006-02 (part), 2006: Prior code § 4318)

Attachment C – Glossary of Terms and Acronyms

Term / Acronym	Definition
ALERT	Automated notification or callout indicating a system failure, high level, or potential overflow condition.
BMP (Best Management Practice)	Procedures or controls implemented to prevent or reduce pollutant discharges to the sanitary sewer or environment.
Cal OES	California Office of Emergency Services – agency notified of certain spill events.
CCTV (Closed-Circuit Television)	Video inspection method used to assess condition of sewer pipelines.
CIWQS	California Integrated Water Quality System – online reporting system for sanitary sewer overflows (SSOs).
Collection System	Network of gravity sewers, force mains, manholes, and lift stations that collect and convey wastewater to the Water Reclamation Facility.
Enrollee	Public agency that owns or operates a sanitary sewer system subject to State Water Board Order No. 2022-0103-DWQ.
FOG	Fats, Oils, and Grease – substances that can accumulate in pipes and cause blockages or overflows.
GIS (Geographic Information System)	Computerized mapping system used to maintain spatial data for sewer infrastructure.
I&I (Inflow and Infiltration)	Stormwater or groundwater entering the sanitary sewer system through defects, improper connections, or direct inflow.
LRO (Legally Responsible Official)	Designated official authorized to certify reports and documents in CIWQS on behalf of the Enrollee.
O&M (Operations and Maintenance)	Activities necessary to properly operate, inspect, clean, repair, and maintain the collection system.
OERP / SERP	Overflow Emergency Response Plan / Spill Emergency Response Plan – procedures for responding to and reporting spills.
Overflow (Sanitary Sewer	Any discharge of untreated or partially treated wastewater from the

Term / Acronym	Definition
Overflow or SSO)	collection system to the environment.
Preventive Maintenance (PM)	Scheduled inspections and cleaning designed to prevent blockages and equipment failures.
Regional Water Board	California Regional Water Quality Control Board – agency responsible for local enforcement of State Water Board Orders.
SCADA (Supervisory Control and Data Acquisition)	Automated control system used to monitor and operate lift stations and other wastewater facilities.
SSMP (Sewer System Management Plan)	The City's comprehensive program for the management, operation, and maintenance of its sanitary sewer collection system, required under Order No. 2022-0103-DWQ.
SSO (Sanitary Sewer Overflow)	Discharge of untreated or partially treated wastewater to land, water, or storm drains prior to treatment.
State Water Board / SWRCB	State Water Resources Control Board – agency that issues statewide wastewater regulations and oversees reporting.
WRF (Water Reclamation Facility)	City of Visalia facility that receives, treats, and reclaims wastewater for disposal or reuse.