

VISALIA WRF DIGESTER 9

SCOPE OF SERVICES

1.0 Project Management

1.1 Project Management and Meetings

Carollo will provide project administration and management necessary to perform planning, execution, monitoring, and reporting of the project elements.

Carollo will lead monthly meetings with City staff and key project team members to provide updates on progress and address any issues or concerns.

Carollo will lead a kickoff meeting with the City and project team to review the scope and schedule. Project team will present and seek feedback on key design elements.

Deliverables:

- Monthly invoices and associated progress letter reports, including budget and schedule updates.
- Kickoff and monthly meeting agendas and minutes.

Assumptions:

- The design phase of the project has a duration of 14 months.
- Kickoff meeting will include travel for three key expert team members to attend in person and other key project team members will attend remotely as necessary.
- Monthly progress meetings will be held remotely and will be attended by the Project Manager, Project Engineer, and other key team members as necessary.

2.0 Preliminary Design

2.1 Conduct Topographic Survey

Carollo will contract with a subconsultant to provide surveying professional services. Surveying subconsultant will develop a topographic map of the proposed project site to serve as a base map for the design and to determine elevations of the existing surface and critical infrastructure. Ground control surveys will be performed and temporary benchmarks will be established at the project site. Mapping will be performed based on a specified horizontal and vertical datum. Carollo Senior Professionals will review the surveying deliverable for accuracy and incorporation into future design deliverables.

2.2 Conduct Geotechnical Investigation

Carollo will contract with a subconsultant to provide geotechnical professional services. Geotechnical consultant will perform borings onsite within the proposed project area and develop a draft and final report to determine site conditions and recommendations for the site grading and subgrade requirements. Senior Professionals will review the draft geotechnical report and provide feedback for incorporation into a final geotechnical report.

2.3 Preliminary Design

Carollo will conduct preliminary design to serve as the basis for developing the detailed design of the digester and ancillary facilities. The historical data analysis and future projections completed as part of the 2024 Master Plan will be used as the basis for sizing digestion facilities. The Digester 9 tank will be similar in size and configuration as Digester 8. The preliminary design will include the following elements:

- Recommendation of equipment
 - Digester 9 mixing system
 - Digester 9 sludge heating system
 - Boiler 4 type, capacity, and integration with existing hot water loop
 - Digester 9 digested sludge transfer pumps
 - Digester 9 ferric chloride feed system
 - Digester 9 features including cover type, gas equipment, manway access, and coating system
- Recommend digester feed and dewatering feed strategy for new Digester 9 and integration with Digester 8
- Identify tie in locations for key utilities including primary sludge, thickened waste activated sludge, digested sludge, hot water return and supply, digester gas, ferric chloride, and electrical power.
- Confirm MCC/boiler building type and approximate layout
- Identify key project components and develop proposed layout
- 30% construction cost estimate

The project team will hold a Carollo C.A.M.P workshop with the City to present options and recommendations for the equipment configurations identified above. During the workshop, the project team and the City will discuss and make decisions for incorporation into the detailed design. The decisions made during the workshop will be documented in meeting minutes.

In addition, the preliminary design will include the following 30% drawings:

- Design criteria and equipment sizing
- Overall site layout
- Process and instrumentation diagrams

Construction cost estimates will be prepared based on quantity takeoffs, estimating guides, equipment manufacturers' quotes, and construction cost estimates of similar facilities. Contingencies for general estimating, general conditions, contractor overhead and profit, escalation to midpoint of construction, and annual cost escalation will be included in the construction cost estimate. The 30% cost estimate is anticipated to be a Class 4 estimate as defined by the Association for the Advancement of Cost Engineering International, which has an expected accuracy between -30% and +50%.

Deliverables:

- Preliminary design C.A.M.P workshop meeting minutes (pdf)
- Comment response log
- 30% drawings
- 30% construction cost estimate

Assumptions:

- Digester 9 will be similar in size and configuration to the existing Digester 8 but will include piping modifications to be directly fed primary sludge and thickened waste activated sludge.
- Digester 8 facilities, including feed and transfer piping, sludge heating, and sludge mixing, will not need to be modified.
- Primary sludge and thickened waste activated sludge pumping systems will not need to be modified.
- The existing ferric chloride storage and feed pump system will not need to be modified.
- The existing hot water piping will not need to be rehabilitated.

3.0 Detailed Design

3.1 Develop 50% Design

Carollo will provide a 50 percent design submittal, which will include the following information:

- Design criteria
- Process flow diagram
- Site plan
- Paving and grading and yard piping plans
- Structural plans and sections for the digester, control building, and major equipment pads
- Mechanical plans and sections for major equipment
- Electrical one-line diagram and electrical equipment elevations
- Electrical site plans
- Process and instrumentation diagrams,
- Draft specifications for major mechanical equipment and equipment control descriptions

Carollo will perform an internal quality control check of the 50% design deliverable in parallel with the City's review of the submittal.

Carollo will prepare a construction cost estimate based on the 50% design drawings. Construction cost estimates will be prepared based on quantity takeoffs, estimating guides, equipment manufacturers' quotes, and construction cost estimates of similar facilities. Contingencies for general estimating, general conditions, contractor overhead and profit, escalation to midpoint of construction, and annual cost escalation will be included in the construction cost estimate. The 50% cost estimate is anticipated to be a Class 3 estimate as defined by the Association for the Advancement of Cost Engineering International, which has an expected accuracy between -20% and +30%.

Carollo will prepare for and lead a 50% design review workshop to present progress on the design and discuss any feedback from the City. The workshop will include travel for three team members to attend in person and other key project team members will attend remotely as necessary.

In addition, Carollo shall also provide a response to all City review comments and shall provide the City with any potential construction cost increase estimates and gain City approval of additional costs prior to performing design modifications on that comment.

Deliverables:

- 50% design drawings (three hard copies at half-size, 11x17)
- 50% design specifications (one hard copy)
- 50% construction cost estimate
- 50% design review workshop agenda and minutes.
- Comment response log

Assumptions:

- City will review 50% deliverable and provide any feedback to be incorporated within three weeks of submittal
- The project will follow CSI MF95 format utilizing Divisions 01 through 17.
- The project will follow Carollo's CAD standards.

3.2 Develop 90% Design

Carollo shall provide a 90% design submittal, which shall be a complete set of contract documents. Additionally, the 90% deliverable shall have incorporated applicable internal and City review comments from the 50% design review. The 90% deliverable shall include all draft specifications required for the project. The City's front-end specifications (Request for Bidders document) will be used for this project. The City's front-end specifications will be reviewed by Carollo's risk management to suggest changes to mitigate risk during bidding and construction. The front-end specs will be supplemented as necessary with Carollo's specifications to provide a complete bidding package. The project team will update the front-end specifications with project specific information.

Carollo will perform an internal quality control check of the 90% design deliverable in parallel with the City's review of the submittal.

Carollo shall prepare a construction cost estimate based on the 90% design drawings. Construction cost estimates shall be prepared based on quantity takeoffs, estimating guides, equipment manufacturers' quotes, and construction cost estimates of similar facilities. Contingencies for general estimating, general conditions, contractor overhead and profit, escalation to midpoint of construction, and annual cost escalation shall be included in the construction cost estimates. The 90% cost estimate is anticipated to be a Class 2 estimate as defined by the Association for the Advancement of Cost Engineering International, which has an expected accuracy between -15% and +20%.

Carollo will prepare for and lead a 90% design review workshop to present progress on the design and discuss any feedback from the City. The workshop will include travel for three team members to attend in person and other key project team members will attend remotely as necessary.

In addition, Carollo shall also provide a response to all City review comments and shall provide the City with any potential construction cost increase estimates and gain City approval of additional costs prior to performing design modifications on that comment.

Deliverables:

- 90% design drawings (three hard copies at half-size, 11x17)
- 90% design specifications (three hard copies)
- 90% construction cost estimate

- 90% design review workshop agenda and minutes.
- Comment response log

Assumptions:

- City will review 90% deliverable and provide any feedback to be incorporated within three weeks of submittal
- The project will not need to be approved through the City's Building Safety Division
- The City will provide their front-end specifications to be incorporated into the deliverable one month prior to the project team submitting the 90% deliverable.

3.3 Develop 100% Final Design Package

Carollo shall provide 100% design drawings and specifications, suitable for bidding. The bid set deliverable shall have incorporated applicable internal and City review comments from the 90% design review.

Carollo will perform an internal quality control check of the 100% design deliverable prior to submitting to the City. The 100% design deliverable will be stamped and digitally signed by professional engineers registered in the state of California.

If no major project elements are added after the 90% design deliverable, the 90% construction cost estimate will serve as the engineer's estimate for the basis of bidding. It will be discussed at the 90% design review workshop if there are review comments that warrant a change in the design and update to the construction cost estimate.

Deliverables:

- 100% design drawings (pdf)
- 100% design specifications (pdf)

4.0 Permitting

Carollo will assist the City in obtaining the necessary permit approvals from regulatory agencies in order to construct the digester and ancillary facilities. Carollo will respond to comments and make necessary revisions to design documents as required by the regulatory agencies. The anticipated permitting requirements include CEQA and San Joaquin Valley Air Pollution Control District approvals.

4.1 CEQA Permitting

The construction of a new digester and ancillary facilities is a project that is anticipated to trigger compliance with the California Environmental Quality Act (CEQA). It is anticipated that the project will apply for a Categorical Exemption. Carollo will hire a subconsultant to develop and submit the necessary applications.

Deliverables:

- Draft and Final Categorical Exemption application (pdf)

Assumptions:

- City will pay for any filing or processing fees required for approval

4.2 SJVAPCD Permitting

The San Joaquin Air Pollution Control District (SJVAPCD) will need to issue an Authority to Construct for the digester improvements. Additionally, the new boiler will require completion of a supplemental form, *Boilers, Steam Generators, Dryers, and Process Heaters*. The boiler will be permitted to run on natural gas or digester gas to provide flexibility in future operations. Carollo will hire a subconsultant to develop and submit the necessary applications. The Authority to Construct won't be able to be completed until during construction, because it requires input from the contractor to provide the make, model, and serial number for the specific unit that is to be installed at the site. Carollo and the subconsultant will develop a schedule with milestones to progress the permitting process so as to not be on the critical path for substantial completion of the construction project.

Deliverables:

- Draft and Final Authority to Construct application and supplemental boiler form (pdf)

Assumptions:

- City will pay for any filing or processing fees required for approval
- The new boiler will be less than 5.0 MMBTU/hr
- The new digester can tie in to the current digester gas pipeline network without any additional permitting requirements of the existing gas handling equipment.
- The new boiler can tie in to the current hot water loop without any additional permitting requirements of the existing boilers.

5.0 Bid Support

5.1 Bid Support

Consultant will attend one pre-bid meeting for the prospective bidders on the City's behalf.

During the bid period, Consultant will respond to questions from prospective bidders and provide written response. Verbal or written questions requiring clarification of the contract documents will be resolved by issuing addenda.

Deliverables:

- Response to bidder questions and updated drawings and specifications as necessary.
- Conformed drawings incorporating changes by addenda following bidding (three hard copies of half-size (11x17) drawings and specifications)

Assumptions:

- The scope of work covers support for a single bid period.
- Consultant will respond to 60 bidders questions and update 20 drawings and 10 specifications.
- The City will complete the following tasks:
 - Manage printing, advertisement, and sale of contract documents during the bid period.
 - Issue bid packages to prospective bidders and maintain bid tabs.
 - Answer procedural questions from prospective bidders.
 - Compile and distribute addenda to prospective bidders.

- Open and tabulate bids.
- Issue Notice of Award and Notice to Proceed to successful bidders.

6.0 Engineering Services During Construction

6.1 Project Management

Carollo will provide project administration and management necessary to perform planning, execution, monitoring, and reporting of the project elements.

6.2 Submittal Review

Carollo will provide technical review of submittals and provide designation for approval or denial of project components. Submittals will be reviewed by the appropriate project and discipline engineers.

6.3 Request for Information Review

Carollo will provide technical review of requests for information and provide responses to resolve and provide direction to contractor's questions during construction. RFIs will be reviewed by the appropriate project and discipline engineers.

6.4 Progress Meetings and Site Visits

Carollo will attend progress meetings remotely and on site led by the contractor and construction manager. Carollo will engage in discussion, provide updates to outstanding submittals and RFIs, and work with the construction team to resolve issues.

6.5 Change Order Review and Design Changes

Carollo will support the construction manager in providing technical review to change orders requested by the contractor. Review may include providing justification to support approving or denying change orders based on field conditions and requirements in the contract documents. Carollo will also provide design changes as necessary to support modifications to the contract documents and provide direction to the contractor. Design changes may include issuing new drawings or specifications for incorporation into the project.

6.6 Start Up and Commissioning Support

Carollo will support the contractor's commissioning coordinator by reviewing and providing feedback on startup and commissioning plans. Carollo will provide on site and remote support during critical commissioning phasing to ensure plant staff are receiving adequate training, equipment meets testing requirements, and digester meets performance standards.

6.7 Record Drawings

Carollo will provide final record drawings for documentation that revise the bid set drawings to include changes made during construction.

6.8 Operations and Maintenance Manual

Carollo will incorporate approved submittals from the contractor into an O&M manual to document equipment information and processes added or modified as part of this project. The O&M manual serves as a guiding document for plant staff to provide a process overview and understanding, troubleshoot equipment and processes, and outline equipment maintenance requirements.

Deliverables:

- Monthly invoices and associated progress letter reports
- RFI responses
- Design clarifications, as needed
- Submittal and resubmittal review responses
- Change order request review comments
- O&M manual (three bound hard copies)
- Record drawings (one hard copy, full size 22x34)

Assumptions:

- Attending bi-weekly construction progress meetings including site visits and observation by design engineers to support construction work (25 online and 25 in-person)
- Response to requests for information (RFIs) (up to 150)
- Provision of design clarifications as needed (up to 10)
- Submittal review (up to 360 and 180 resubmittals)
- Assistance in review of change orders (up to 10)
- ESDC will last for the duration of construction, which will be 24-months.
- The City will contract with another firm to provide construction management of the project.