

# Hidden Valley Lake Community Services District

## Water System Storage Reliability Project

### Scope of Work

#### **PRE-AWARD DESIGN TASKS**

**Site Visits.** District representatives have met with Coastland engineers to kick-off the project, discuss the application process, observe site conditions, and identify design constraints and opportunities.

**Attend HGMP Training.** An engineer attended HGMP training in order to better understand the application process.

**Survey.** A topographic ground survey was conducted of the tank parcel and extending to the west approximately 150 feet to the west beyond the property boundary. The survey shows all existing features, including the water tank, booster pump station, access road, fencing, utilities, trees, walls, and property boundaries. HVL CSD marked all existing buried utilities on the site prior to survey. A base map was prepared as a basis for the project design.

**Environmental Compliance Investigations.** Environmental planners conducted biological and cultural investigations and/or site surveys to identify any circumstances that warrant special protection and may impact the use of the site.

**Prepare Engineering Calculations.** Coastland Engineers reviewed the 2001 Hidden Valley Lake CSD Water Master Plan Update and updated the calculations therein to determine the appropriate capacity of the replacement tank(s) to provide adequate fire flow under existing development conditions. The proposed maximum water surface elevation of the new tank(s) will match that of the existing to maintain the equivalent water pressure in the zone. The new tank diameter of 42.5 feet were determined based on the need for two tanks, site topographic elevations, maximum water surface elevations, and standard bolt tank sizes. These calculations are included as the Tank Sizing Memo in the Designs section of the binder. Other work conducted in this task was (1) reviewing available plans and other documentation related to the water system and tank and (2) researching steel tank specifications and costs.

**Preliminary Design.** A preliminary site plan was prepared showing the location of the proposed improvements. Design constraints included the strong preference to have the entire tank located on a cut surface as well as site restrictions such as steep slopes, a relatively small parcel size, and the location of the existing pump station (which is to remain). The most cost-effective design solution, based on many iterations of one or two tanks in different locations, was determined to be two tanks, one on either side of the existing tank. There are two important advantages of having two tanks rather than one. The first is that it allows the existing tank to remain in service while the first tank is constructed (this was difficult to provide with the one tank solutions because of site limitations). This eliminates the need for a temporary water supply reservoir which would have been difficult and expensive to implement based on limited amount of flat land at the appropriate elevation. The second advantage is ease of maintenance because when there are two tanks in a zone, one can easily be taken out of service

for maintenance or inspection. The two tanks require extensive grading and construction of retaining walls up to five feet tall and 140 feet long for Tank 9A and ten feet tall and 130 feet long for Tank 9B.

Preliminary site design included the location and sizing of retaining walls to allow for vehicle access around each tank as well as drainage improvements, fencing, and trees to be removed. The plans include sections through the tanks and retaining walls. The plans also show the location of proposed property lines after a lot-line adjustment. This was required to fit the proposed tanks as well as a 100-foot defensible corridor radius around each tank (as required by the local Fire Marshall).

The preliminary design consisted of preparation of a title sheet showing a vicinity map and sheet index; a legend and abbreviations sheet; a project area plan showing property dimensions, staging areas on an aerial background, and a proposed lot line adjustment; two site plans showing the construction of two tanks; sections; and a defensible space plan. The preliminary plans are included in the Design section of the binder.

**Prepare Scope of Work, Cost Estimates and Schedule.** Coastland Engineering prepared this scope of work to describe every element of the project. A cost estimate and project schedule was prepared detailing pre-award design, post-award design, construction tasks, and construction management and inspection.

**Prepare Benefit-Cost Analysis.** A BCA analysis was conducted in order to demonstrate a benefit-cost ration greater than one. Coastland Engineers provided justifications and data as required for all assumptions.

**Prepare Sub-Application.** The FEMA sub-application was prepared, including mapping and project documentation as required.

## **POST-AWARD DESIGN TASKS**

**Kick-off Meeting.** A kick-off meeting will be conducted post-award to review the scope and discuss details of tank operation and control, environmental constraints, and other issues that will shape the final design.

**Progress Design Review Meetings.** Two other progress design meetings via conference call (1.5 hours each) will be attended by the Principal Engineer and Senior Engineer following District review of progress submittals.

**Prepare Environmental Permits.** Environmental planners will provide documentation and prepare permits that are necessary for the proposed project.

**Geotechnical Investigation.** A geotechnical investigation will be conducted to provide design guidance for the tank foundation, retaining walls, pavement design, and site grading.

**Lot-Line Adjustment.** The preliminary design determined that a 0.72-acre lot-line adjustment is necessary to fit both tanks and their 100-foot defensible corridor. Preliminary negotiations have been completed between the HVL Homeowners Association (adjacent parcel owner) and the District, and the

HOA is amenable to the lot-line adjustment. The work to record the lot-line adjustment is accomplished in this task.

**Prepare Bid Documents.** A civil engineering firm will prepare bid documents, including plans and specifications, for the proposed project. The plan set will include:

- A demolition plan that shows the limits of removal for the existing fencing, tank, trees, piping and appurtenances to be removed;
- A grading and drainage plan that shows the location of retaining walls, if necessary, the expanded pad, and drainage features that will convey stormwater to existing drainage channels;
- A site plan that shows the extent of paving for a new access road around the tanks and the location of new fencing.
- A vegetation maintenance plan that shows the extent of vegetation clearing and pruning for maintaining the defensible space around the tank.
- A retaining wall and foundation plan that shows a reinforced-concrete ring foundation for the tank, and the retaining walls.
- A tank and piping plan that shows the new tank and appurtenances, and new piping connections to the existing water mains.
- Electrical plans showing tank controls and telemetry
- Additional sheets that show structural details for the retaining walls and foundation, sections, details for fencing, piping, and tank appurtenances.

The engineering firm will also prepare written instructions for the work, or specifications, that, together with the plan set, comprise bid documents that are suitable for public bid. The engineers will provide a 60%, 95% and Final submittal. Each submittal will incorporate the District's previous review comments.

**Contract Bid and Award.** The project will be advertised, put out to public bid and awarded to the lowest bidder. Coastland Engineers will prepare any necessary addenda and respond to requests for information from contractors. They will also provide assistance to the District as needed during the advertising process. They will also attend the bid opening and analyze the bids to ensure that they meet the bid requirements.

**Construction Management and Inspection.** Construction management and inspection occurs during the construction phase to represent the District and oversee every element of the construction of the project.

## **CONSTRUCTION TASKS**

**Mobilization** includes obtaining permits, installing environmental protections, moving equipment and materials to the site, hiring subcontractors, ordering materials, preparing submittals, and conducting project administration. It also includes the work to demobilize from the site and close up the project and the grant.

**Remove Trees and Grind Roots** will involve removing 23 trees from the project area.

**Clearing and Grubbing/Vegetation Management** involves removing vegetation and organic soils within the areas of excavation as well as conducting weed abatement and pruning trees within the 100' defensible corridor around each tank.

**Demolish Security Fence** involves the removal of 344 linear feet of fencing (lf).

**Site Excavation** involves excavating 3,136 cubic yards (cy) of soil, building a road embankment, off-hauling 2,690 cy of soil 5 miles to the HVL WWTP. An excavator will be used to excavate the soil directly into 10-wheeler dump trucks. The off-hauling of soil will take approximately 280 trips.

Mass grading will occur for both tank sites simultaneously. The Tank 9B site will be used as a staging area during the construction of Tank 9A.

**Drainage** includes the installation of 190 feet of 12" storm drain piping and 2 drop inlets.

**Security Fencing.** Approximately 670 feet of 8' tall security fencing will be constructed at the property boundaries to protect the site. A 15'-wide gate will be installed at the access road.

**Water Main Piping.** Water main piping will be extended from the existing water main to Tank 9A (no connections will be made at this time). Overflow drains will also be constructed. Buried water main will match the existing 8-inch C900 PVC pipe and will be buried with 40 inches of cover. Exposed water main or drain piping will be ductile iron.

**Concrete Retaining Walls and Tank 9A Foundation.** Retaining walls for both Tank 9A and 9B will be constructed simultaneously. Tank 9A's retaining wall will be 140' long with heights ranging from 1-5' high. Tank 9B's retaining wall will be 130' long with heights ranging from 1'-10' high. A reinforced concrete ring foundation will be poured for Tank 9A.

**Tank 9A Construction and Testing.** Tank 9A will be assembled from pre-coated steel panels onsite. After assembly, the tank coating will be spot-repaired as necessary. Appurtenances will be added such as caged ladders, manways, drains with vortex breaker, vents and overflow pipes. The tank will be tested for leaks.

**Tank 9A Tie-in to Water System.** The tank and water piping will be disinfected prior to making the connection to the existing water main piping. After the tie-in, Tank 9A will be in service.

**Demolish Existing Tank.** Once Tank 9A is in service, the existing 150,000-gallon redwood tank and foundation will be demolished using an excavator and removed from the site in 10-wheeler dump trucks.

**Water Main Piping to Tank 9B.** Water main piping will be extended from the existing water main to Tank 9B (no connections will be made at this time). Buried water main will match the existing 8-inch C900 PVC pipe and will be buried with 40 inches of cover. Trench excavation will be conducted using an excavator. Some piping will be removed out of the footprint of the new tanks. Exposed water main or drain piping will be ductile iron. Overflow drains will also be constructed (once the tanks are built). This task also includes connecting the new water pipe to the existing water main (once the tanks are built). Unit costs for water main pipe and valves are based the average of bid tab data from similarly sized projects.

**Tank 9B Foundation.** A reinforced concrete ring foundation will be poured for Tank 9B. The ring foundation has not yet been designed, but the assumed dimensions were taken from another tank project of similar size.

**Tank 9B Construction and Testing.** Tank 9B will be assembled from pre-coated steel panels onsite. After assembly, the tank coating will be spot-repaired as necessary. Appurtenances will be added such as caged ladders, manways, drains with vortex breaker, vents and overflow pipes. The tank will be tested for leaks.

**Tank 9B Tie-in to Water System.** The tank and water piping will be disinfected prior to making the connection to the existing water main piping. After the tie-in, Tank 9B will be in service.

**Paving.** The 15-foot wide access road will be paved with 3 inches of asphalt concrete over 6 inches of aggregate base.

**Demobilization.** Demobilization includes final inspection, completion of the final punch-list tasks, and the removal of equipment and supplies from the site.

**Project Close-out and Record Drawings.** This task involves completion of project paperwork and records, as well as preparing as-built drawings.

**Grant Close-out.** Grant close out involves completing the paperwork and inspections required to complete the project to the satisfaction of FEMA and CalOES.