



Water / Wastewater Design Services

E2 Consulting Engineers, Inc. (E2) has been providing engineering services to both government and private sector clients since the company began with water and wastewater engineering work in 1988. E2 provides a broad range of professional/technical services from initial project planning and feasibility studies through construction management, project management and operational guidance. E2 performs as a prime contractor or a subcontractor, and on both short- and long-term projects. We often team with major A&E and construction companies as well as other planning and environmental consulting firms.

Water/Wastewater Engineering Services

- Planning
- Design
- Construction Management
- Hydraulic Network Modeling
- Odor Control
- Value Engineering
- Constructability Review
- Third party QA/QC review
- Construction Cost Estimating
- Project Control/Scheduling

Recent Projects

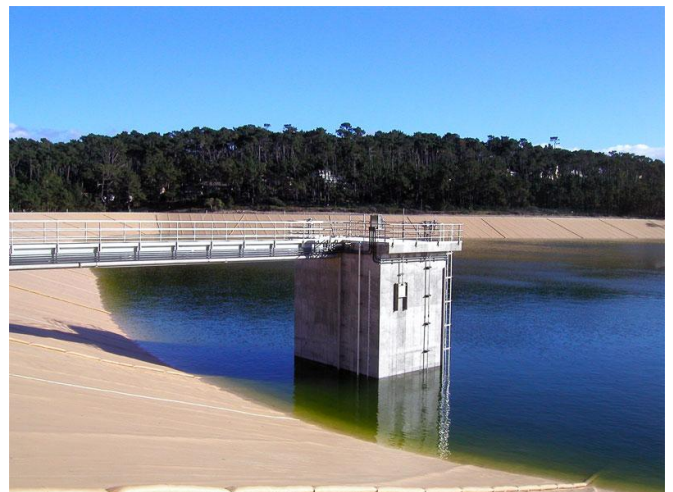
Pebble Beach Community Services District

Carmel Area Water District / Pebble Beach Community Services Phase II – Wastewater Reclamation Project

The Pebble Beach Community Services District (PBCSD) retained E2 to provide



Forest Lake Liner Installation





engineering services for the expansion of the CAWD/PBCSD Wastewater Reclamation Project and to design the modifications that has converted Forest Lake from a former potable water storage reservoir into a reclaimed water (MF/ RO product water) seasonal storage reservoir to better serve peak irrigation demands of current customers. The Phase II – Wastewater Reclamation Project has two major components: 1) Rehabilitation of Forest Lake Reservoir embankments to relieve seismic deficiencies to the satisfaction of the California Division of Safety of Dams (DSOD), and 2) construction of 4.4 mgd treatment facilities.

Major components of the projects included:

- Rehabilitation of existing reservoir
- Intake/outlet structure
- Algae control facilities
- In-lake low pressure aeration system
- Pumping facilities
- Filtration plant and backwash facilities
- Chemical feed systems
- 36-inch diameter emergency overflow pipeline
- Energy dissipation structure
- Tunnel through reservoir embankment
- Security system
- Underground piping
- Final site grading
- Installation of monitoring wells and manholes
- Preparation of monitoring plan
- Annual monitoring reports for DSOD

The facilities were designed to allow for the incorporation of pressure filters in the future.

During the construction phase, E2 provided construction management and engineering support services, and operations and maintenance training to the District staff.

Wastewater Pump Station Upgrade and Sewer Line Rehabilitation Projects

PBCSD's collection and interceptor system consists of 60 miles of primarily 6-inch gravity collector sewers, over 11 miles of 8-inch to 27-inch gravity and force main interceptors and eight pump stations ranging in capacity from 80 gpm to 3,000 gpm.

PBCSD has an ongoing program to conduct video inspection of the existing collection systems and physical inspection of manholes. PBCSD Maintenance Staff documents and identifies lines and manholes that require rehabilitation or replacement.

Since 2005, PBCSD has retained E2 to prepare contract documents (Plans and Specifications) to rehabilitate sewer lines using pipe bursting techniques, as well as provide bidding phase and engineering support during construction and construction management support to the District staff. E2 continues to evaluate existing pump stations and force mains; and recommends necessary improvements to allow continued safe, reliable, and efficient operation of the pump stations and force mains. The scope of work includes: (i) evaluation of existing conditions, (ii) future capacity requirements, (iii) reliability evaluations, (iv) engineering support during construction, (v) construction management services, and (vi) development of recommended rehabilitation or replacement plans including preliminary design and preparation of contract documents for construction.



Water Distribution System Fire Protection Improvements

PBCSD retained E2 to evaluate the existing water distribution and storage system — owned and operated by California-American Water Company (Cal-Am) — to determine its ability to provide an adequate water supply for fire suppression purposes, to implement system improvements, and to develop a five-year capital improvement program. E2 worked closely with Cal-Am and utilized fire flow, hydrant spacing and storage standards, as established by Monterey County and modified by the Pebble Beach Fire Department, to meet the unique nature of the District. A detailed computerized hydraulic network model of the existing system was developed. E2 completed design for the Third, Fourth, and Fifth priority projects. E2 also provided engineering services during construction and construction management services for all three projects. Since 2006, E2 has conducted field testing of approximately 90 fire hydrants per year and calibrated hydraulic network model developed for the PBCSD water system.

Orange County Sanitation District Capital Improvement Program

E2 is working with the Integrated Management Program Consultants (IPMC) team on the \$2.1 billion Capital Improvement Program (CIP) for Orange County Sanitation District (OCSD). The CIP will allow OCSD to meet the standards for full secondary treatment by 2012 through numerous and extensive rehabilitation and expansion projects. E2 is working in the Program Management Office (PMO) for OCSD to implement projects in accordance with OCSD's Capital Project Management Life Cycle, which includes the following phases: Project Development, Preliminary Design, Design, Construction & Installation,



Commissioning and Closeout. E2 and the PMO follow project milestones in accordance with the Project Management Book of Knowledge (PMBOK) developed by the Project Management Institute (PMI).

E2 performed project validations and provided engineering services on the following OCSD projects:

P2-80: Primary Treatment Rehabilitation and Refurbishment at Plant 2

E2 performed condition assessments of existing below grade influent and effluent pipelines (48-inch in diameter and larger), structural components, and mechanical equipment. The work also included physical and closed circuit television inspections, as well as collecting and testing of concrete samples for corrosion. E2 personnel also prepared a bypass pumping and inspection sequencing plan to conduct inspection without interrupting day-to-day plant operations.

P1-100: Sludge Digester Rehabilitation at Plant 1

E2 performed structural and mechanical inspection/condition assessments of ten existing digesters, two holding tanks, five



control buildings / pump stations, and several tunnels. The scope of work included: development of condition assessment approach and procedures, field inspection for condition assessment, concrete testing and structural evaluations, collection of data, performance of condition assessments, and preparation of condition assessment technical memorandums for each type of facility.

Contract No. 5-50: Replacement of Rocky Point Pump Station

E2 provided structural design for the replacement pump station. Major components are the below grade wet-well and pump room; Mezzanine floor for mechanical piping and electrical equipments access; electrical building above grade; emergency generator building; building design incorporating architectural features; condenser access platform; and retaining walls. This facility was designed to meet CBC 2007 and IBC 2006 building codes for seismic requirements. E2 also provided bidding phase and engineering support services during construction.

OCSD Collections System

E2 Project Managers have delivered eight projects under the PMO office for OCSD as of the end of 2010. Some of these projects include: rehabilitation to College Avenue; MacArthur and Westside Pump Stations; rehabilitation of Coast Trunk Sewer; and the implementation of the first Design Build project for OCSD – Rehabilitation of Magnolia Trunk Sewer. All projects were delivered using the CIP Life Cycle which makes the Project Manager responsible for the project during all six project phases described above, resulting in a true “Cradle to Grave” project delivery process.

Monterey County Water Resources Agency (MCWRA)

MCWRA completed its implementation of the Salinas Valley Water Project (SVWP) as a solution to meet long-term water quality and quantity needs of the Salinas Valley groundwater basin. The project consisted of two elements: the Nacimiento Dam Spillway Modification Project; and the Salinas River Diversion Facility. E2 personnel provided construction management and engineering services for these projects:

Salinas Valley Water Project – Nacimiento Dam Spillway Modification Project

This element of the project will allow the Probable Maximum Flood to safely pass through Nacimiento Dam Spillway and allow winter runoff to be captured within Nacimiento Reservoir. This Dam is under regulatory jurisdiction of the California Department of Water Resources Division of Safety of Dams (DSOD) and the Federal Energy Regulatory Commission (FERC) due to the existence of the Nacimiento Hydroelectric Plant located on the site. The major components are: Dam spillway modifications using inflatable low pressure bladder; spillway approach wall modifications; and replacement of existing high level gates operating system.





E2 provided construction management services and engineering services, including the review of the Preliminary Design Report (PDR); 60%, 90%, and 100% design Contract Documents (Plans and Specifications); construction cost estimates; and construction schedule. E2 was also responsible to review geotechnical reports and provide value engineering analysis at PDR level. Project construction started in April 2008, and was completed in May 2009. Total construction cost for this project was \$10 million.



Inflatable rubber dam across Salinas River

Salinas Valley Water Project – Salinas River Diversion Facility

This facility is located on Salinas River, downstream of the Nacimiento Dam and approximately five miles upstream of Monterey Bay. Major components are:

- Inflatable rubber dam across Salinas River
- River intake
- Fish bypass
- Pump and Filter station
- River water chlorination
- Delivery pipeline
- Surge suppression system
- Instrumentation and Controls
- Blanco Drain diversion pipeline
- Permit compliance

E2 provided construction management services and engineering services including review of the 30% Preliminary Design Report; 60%, 90%, and 100% design Contract Documents (Plans and Specifications); value engineering analysis; construction cost estimates; and construction schedule. E2 presented findings and recommendations to the MCWRA and Design Engineer. This project was completed in April 2010.

Dublin San Ramon Services District

Recycled Water Project

E2 managed and provided engineering services for Civil and Structural design for construction of this project. E2 also coordinated engineering design with other District's consultants to accommodate future facilities. Major components are: Tertiary Influent pumping station; Rapid Mix; Flocculation basins; filtration; UV disinfection; and Effluent Pumping. Project included approximately 600 feet of 30-inch diameter Force Main and 300 feet of tunneling to avoid open cut construction method.