Proposal for

ON-CALL ENGINEERING SUPPORT SERVICES

Technical Proposal by

Schaaf & Wheeler

CONSULTING CIVIL ENGINEERS

October 27, 2017

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS
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October 27, 2017

Michael Wegley
Marina Coast Water District
11 Reservation Road
Marina, CA 93933

Subject: Qualifications for On-Call Engineering Support Services

Dear Mr. Wegley:

Schaaf & Wheeler is pleased to present qualifications for on-call engineering support to the Marina Coast Water District for the Water, Wastewater and Recycled Water projects. We have studied the request for qualifications and the scope of services extensively, and are confident that we will continue to provide the District with solutions that are cost-effective, constructible, and reliable.

Our firm has provided On-Call services to Marina Coast Water District for over two decades and is familiar with the system and the service areas. During these years our engineers have designed wells, treatment systems, booster pump stations, water tanks, lift stations, a desalination plant, and water, sewer and recycled water mains. Most recently we completed the District's Urban Water Management Plan. Schaaf & Wheeler served as the MCWD District Engineer until 1998 and as Interim District Engineer in 2006-2007, 2012-2013, and 2015. Our staff members have made numerous presentations to the District's Board of Directors and at public meetings, as well as presented projects to numerous other public agencies and regulatory authorities.

The District will benefit from our comprehensive experience of innovative designs for water and wastewater infrastructure to many other public and private clients as well throughout the Bay Area, including the City of Belmont, East Bay Municipal Utility District, Great Oaks Water Company, San Jose Water Company, California Water Service, Santa Clara Valley Water District, City of San Mateo, City of Santa Clara, Ross Valley Sanitary District and the City of Mountain View. We have assembled a team of specialists, each of whom is dedicated to providing a specific scope of service within their expertise through well-defined tasks, budgets, and schedules. Collectively we have demonstrated expertise in rehabilitation/replacement alternatives assessment, design, construction support and constructability review to ensure a workable design with tightly controlled plans and specifications.

The enclosed document presents our qualifications and experience in similar projects. Drawing from our past projects, we understand the potential issues and risks involved in projects in busy urban corridors. Our tested design abilities, a well-thought-out approach, and in-depth knowledge of modeling, planning, assessment, capacity analysis, and alternatives development are critical for successful completion of projects. While keeping the stakeholders' concerns in mind, our engineers follow project management and quality control procedures to lead the projects responsively within schedule and budget.

Andrew A. Sterbenz, PE, who has served as the Interim District Engineer and also prepared the Marina Coast Water District UWMP will serve as the project manager. Leif M. Coponen, PE has been working for MCWD for the past 15 years; he will provide the modeling services. I will be the principal-in-charge and provide peer review and quality assurance while bringing more than 30 years of experience in water and wastewater projects design and construction support. Our proposed team is adept at assembling written reports that meet the needs of the clients and the requirements of the regulatory agencies.

Analyzing the needs of the project, we have included our subconsulting firms – Biggs Cardosa for structural engineering, Fehr Engineers for electrical engineering, Whitson Engineers for Survey and Mapping; and Pacific Crest for geotechnical engineering. For each of these disciplines we have alternative subconsultants who we can call for services as and when needed depending up on the project scope and availability to keep the projects running in time and budget.

We thank you for the opportunity to assist the Marina Coast Water District again. Should you need any further information, please contact Andy Sterbenz at (831) 883-4848 or asterbenz@swsv.com.

Sincerely,
Schaaf & Wheeler

Peder C. Jorgensen, PE
Vice President

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Services Approach

Project Understanding and Approach

Marina Coast Water District intends to issue one or more on-call services contracts for general, capital improvement project and development engineering support services. The selected firm may serve as an extension of District Staff while performing some services, and as a more traditional design consultant for other services. Schaaf & Wheeler has provided these on-call services to the District for over ten years, and has an in-depth knowledge of the District's systems and master plans. Our approach for the categories of support services follow.

General Engineering Support Services

For the General Engineering services described in the scope of work, Schaaf & Wheeler would serve as an extension of District Staff, attending internal meetings and meetings with local agencies in support of various projects. One of the listed tasks is understanding the District's Code and the Engineering Procedures, Guidelines and Design Requirements (PGDR). Schaaf & Wheeler participated in the 2007 update of the PGDR and District standard specifications, and we recommend conducting a review and update of the standard specifications and details to address updates in the AWWA standards and District materials preferences. During the process, the specifications may also be updated from the Construction Specifications Institute 1995 Master Format numbering (5-digit) to the current Master Format numbering (6-digit).

Serving as an extension of Staff, Schaaf & Wheeler has managed and/or supported other consultants preparing technical and environmental documents for the District. Our most recent efforts include supporting the development of a CEQA Initial Study for Annexation of the Ord Community, and providing technical input and review for design of the RUWAP Water Main. When needed, we have drafted staff reports for Board of Directors meetings, and have presented items to the Board when appropriate. Our project manager provides status updates to the District Engineer and participates in department staff meetings to keep everyone "in the loop." We interact with many of the planning and public works staffs of the jurisdictions served by MCWD, including Monterey County, the City of Marina, the City of Seaside and Monterey One Water.

Schaaf & Wheeler has maintained the District's water and wastewater system models in Innovyze's H2O-Map since 2007. We update the models, when requested, to reflect completed capital improvement projects and development projects. Most often, this task entails running fire flow scenarios for proposed developments to confirm pipeline sizing and analyze changes to pressure zone boundaries. The District's system has five main pressure zones, but also several reduced pressure areas served through PRVs. Understanding the reduced pressure areas helps in identifying errors in field hydrant flow test results. The District has hired Akel Engineering to update the master plans, and the models will be converted to Innovyze's InfoWater. Schaaf & Wheeler has a licensed copy of InfoWater, and has used it for management of other client's system models.

Capital Improvement Project Design Services

For Capital Improvement Project Design, we would serve as in a design consultant role, providing a firm scope and fee for the task. Schaaf & Wheeler has an in-depth understanding of the District's current capital program, having compiled the previous master plans into a prioritized capital program listing. We look forward to seeing how the current master planning effort adjusts the project listing.

When requested to provide design services, Schaaf & Wheeler will begin by developing a full understanding of the proposed project and its purpose, be it to add capacity or address a deficiency. For projects originating in the master plans, the underlying development assumptions will be reviewed and the triggering event may be confirmed. In many cases, the actual sequence or type of development differs from the planning documents, and may require an adjustment of the master-planned project. If this is the case, a basis of design report may be prepared analyze alternatives and to document the recommended project configuration.

Schaaf & Wheeler uses sub-consultants for surveying, structural, electrical and geotechnical design, and we will assemble a team tailored to the specific project. Our preference is to use local firms who are familiar with the area, to the extent that they are available. Our subconsultants would include:

- Surveying by Whitson Engineers or Bestor Engineers
- Structural Design by Biggs Cardosa Associates or TJC and Associates
- Electrical Design by Fehr Engineering, MTH Engineers or TJC and Associates
- Geotechnical Engineering by Pacific Crest Engineering, Cornerstone Earth Group or California Engineering Geology

The District has directly contracted with environmental consultants and hydrogeologists for past projects, and we are assuming that trend will continue, although we can easily add those services under our scope if needed. We would assist the environmental consultant in preparing the project description, facility figures and in identifying construction impacts and mitigations.

Critical in the project design is addressing how service to customers will be maintained during the work, since many of the District's projects involve replacement of existing infrastructure, or making additions inside existing networks. Coordinating the phasing plan with the operations staff before the project is issued for bid and including that plan in the contract documents minimizes the chances of project delays and change orders.

Another key coordination step is meeting with the affected land use jurisdiction at the 60% design phase to review the schedule and the encroachment permit conditions. As with the phasing plan, including the encroachment permit in the bid documents reduces uncertainty on the contractor's part. For some projects, we anticipate a need to assist with coordinating facility easements, which entails meeting with the affected landowners or jurisdictions early in the design process to identify site restrictions and coordinate facility siting. For these meetings, we would prepare conceptual plans and figures so the property owner can visualize how much space the District is requesting.

Typical project design includes progress submittals at 60% and 90% complete. For more complex projects, we would schedule earlier meetings with Engineering and Operations Staff to discuss equipment, controls and facility layout preferences. Design documents include drawings, technical specifications and the engineer's estimate of probable construction cost. Schaaf & Wheeler can also prepare the Owner's "front end" contract documents, using the District's standard contract package. We would assist with review of the bids and if needed, we can draft the Board agenda item for award of the construction contract.

Services during construction may be tailored based on the District's needs, from a minimum of attending the pre-construction meeting and reviewing submittals up to fully managing the project for the District, including running weekly progress meetings, coordinating inspections, reviewing contractor pay requests and managing the budget and change order requests.

Development Review Support Services

Schaaf & Wheeler has provided on-call plan review services for MCWD since 2004. We are fully familiar with the District standards and the master plans for the various developments on Fort Ord. This effort is an extension of Staff type service, but all formal reviews are routed through the District's development project manager. A separate billing group is created for each development project so that the District may pass those costs through to the Developer.

In addition to reviewing development plans, Schaaf & Wheeler can work with the developer's engineer preparing the project water and wastewater master plan, when required. Boundary conditions for the site are determined from the current system model and provided to the developer, so that they may develop an on-site system model that nests within the District system. Schaaf & Wheeler would then review the development master plan for compliance with the State and District design standards, and provide written review comments or recommend approval. As part of the review, we would review the system model and master plans to identify any off-site improvements which are triggered by the project.

Schaaf & Wheeler authored the District's 2015 Urban Water Management Plan, and we have prepared Water Supply Assessments (WSA) for development projects within the District's service area. For this service, Schaaf & Wheeler would review the proposed development, verify that it requires a formal WSA under the Water Code, and prepare a formal scope and fee estimate so that the project developer may fund the effort.

Firm Experience

About Schaaf & Wheeler

Firm's Legal Name	**Schaaf & Wheeler** CONSULTING CIVIL ENGINEERS			
S&W Offices	HQ and Mailing Address: 1171 Homestead Rd., Ste. 255, Santa Clara, CA 95050 Phone: (408) 246-4848 ; Fax: (408) 246-5624			
	Other Offices: Salinas – 3 Quail Run Drive, Ste. 101, Salinas, CA 93907 San Francisco – 870 Market Street, Ste. 1278, San Francisco, CA 94102 Santa Rosa – 2200 Range Avenue, Ste. 201, Santa Rosa, CA 95403			
Responsible Corporate Officer and Office for Project Management	Peder C. Jorgensen, PE – Project Manager Address: 1171 Homestead Rd., Ste. 255, Santa Clara, CA 95050 Phone: (408) 246-4848 ; Fax: (408) 246-5624 Email: pjorgensen@swsv.com			
Years in Business and Water and Wastewater Utility Planning	32 years, established in 1985			
Legal form of Company	Corporation, Incorporated in California since 1985			
Principals				
Owners				
Engineers				
Technicians				
All Other Professionals				
TOTAL	**8**	**19**	**2**	**7**
Principals / Owners / Engineers **Charles D. Anderson, PE** **Peder C. Jorgensen, PE** **Daniel J. Schaaf, PE** **Leif M. Coponen, PE** **Benjamin L. Shick, PE** **Andrew A. Sterbenz, PE** **Glen M. Anderson, PE** **Caitlin J. Gilmore, PE** **Principal Emeriti** James R. Schaaf, Ph. D, PE David A. Foote, PE Kirk R. Wheeler, PE	**Senior Engineers** Emily D. Straley, PE Robin J. Lee, PE **Associate Engineers** Rupeet Malhotra, PE Sarah Rahimi-Ardabily, PE Curran L. Price, PE Larry D. Johnson, PE Logan J. Fox, PE Justin R. Maynard, PE Fidel T. Salamanca, PE Stephanie A. Tanverakul, PE		**Assistant Engineers** Lindsay A. Kammeier, PE Josh C. Tabije Alex R. Oran Michelle R. Garza **Junior Engineers** Cassandra L. Fagan Jill Pinkerton Melissa E. Reardon Conor J. Murphy Victoria S. Orduno Jonathan F. Ondracek	

Schaaf & Wheeler is a 38-person civil engineering firm, with 19 California registered professional engineers. Our experienced engineers comprehensively resolve water resources issues throughout California and the western United States. The firm's achievements range from large flood control projects and FEMA flood insurance studies to local agency public works infrastructure projects involving potable water, recycled water, sanitary sewer, and storm drain planning and design. Although certified by the State of California as a small business enterprise, Schaaf & Wheeler has a broad reach. Firm engineers operate from offices in four locations: Santa Clara, San Francisco, Santa Rosa, and Salinas.






Our Areas of Focus

Schaaf & Wheeler focuses exclusively on water projects. Areas of expertise include the following:

- Potable water system master planning, modeling, engineering, and design of supply, storage, collection and distribution systems, including tanks and booster stations;
- Waste water system master planning, engineering, and design of conveyance systems, including pump stations;
- Stormwater management and drainage services, including master planning, engineering, and design of urban storm drain systems and pump stations;
- Hydrology and hydraulics analyses, including site evaluations and modeling;
- Water quality, including design or review of best management practices (BMPs) for storm water treatment and hydro-modification flow control facilities;
- Flood control analyses, including floodplain studies and channel design, filing of letters of map revision, and FEMA coordination;
- Watershed assessments, erosion and sediment control, and bioengineered channel stabilization;
- Recycled water systems planning, engineering, and design; including reclamation feasibility studies and customer retrofits;
- Construction management, construction site observation, construction inspection services, value engineering, construction cost analysis, and constructability reviews;
- Program management, including management of consultants, containment of schedule and cost, and communications with client and stakeholders.

Our Subconsultants

Schaaf & Wheeler works with professional subconsultants for supporting engineering tasks regularly. We have a list of firms for each discipline that may be required in one or the project listed in the District's RFQ. The table below shows our teaming options with subconsultants. In case one of the professional subconsultant is not available or is not most suitable for the tasks identified, we approach another subconsultant. Our engineers have a history of professional relationship with each of the subcosnultants listed here and have our teams have successfully completed multiple water, wastewater and recycled water projects together.

Discipline	Primary Sub-Consultant	Alternative Consultants
Survey and Mapping	1. Whitson Engineers	2. Bestor Engineers
Structural Engineering	1. Biggs Cardosa & Associates	2. TJCAA
Electrical Engineering	1. Fehr Engineers	2. MTH Engineering
Geotechnical Engineering	1. Pacific Crest Engineering	2. Cornerstone Earth Group
		3. Cal-Engineering & Geology Inc.

WE WHITSON ENGINEERS **Whitson Engineers – Survey and Mapping -** WHITSON ENGINEERS (WE) is a general civil engineering and land surveying firm, founded in 1979, with focus in governmental, residential and commercial land development services. The firm's projects are located primarily in Monterey, Santa Cruz, Santa Clara, San Benito and Los Angeles counties, and a vital part of the firm's goals are to continue to provide services specific to these areas while expanding into new areas to serve expanding client network. Whitson Engineers has received several awards for engineering and business excellence. Utilizing the latest in Trimble global positioning systems (GPS), total robotic stations, unmanned aerial vehicles and digital levels, WE's professional staff has the latest in technology at their disposal to provide innovative solutions and an increase in productivity for clients. Whitson Engineers surveying services include Boundary/Right-of-Way Surveys, Topographic Surveys, Aerial Mapping, underground Utility Mapping, A.L.T.A. Surveys, Final Maps, Legal Descriptions, and Construction Staking. *Schaaf & Wheeler has been working with Whitson Engineers since 2015 and has completed the design of Tanimura Lift Station for Tanimura & Antle. Currently, Schaaf & Wheeler is working with Whitson on several development projects in Monterey and San Benito Counties*.

Biggs Cardosa – Structural Engineering. Biggs Cardosa Associates, Inc. (BCA) is a California corporation established in 1986 that provides structural engineering services and project management for multi-disciplinary projects from offices in San Jose, San Francisco, Oakland, Fresno and Orange, California. BCA offers structural engineering design and construction services to public agencies, professional engineers and architects on a wide variety of infrastructure and transportation related projects, including bridge design, retaining wall and sound wall structures, and various hydraulic structures including tanks, pump stations, junction boxes, floodwalls, drainage channels and creek facilities. They specialize in the design, seismic retrofit, modification, evaluation and rehabilitation of these structures for local agencies and Caltrans. *BCA and Schaaf & Wheeler have been working together to provide constructible designs for more than a decade. Currently BCA is providing structural engineering services for the City of San Mateo's 5 sanitary sewer pump stations project and the City of Mountain View's Leong Drive Sewer and Water Main Design project to Schaaf & Wheeler.*

Fehr Engineers – Electrical Engineering - Fehr Engineering Company, Inc. (Fehr) was established in Monterey, California in 1965 by Owner/Founder, Dale J. Fehr, P.E., as a private practice in support of the construction industry. Fehr Engineering Company, Inc. provides complete electrical systems planning, design, construction documents, estimating, and construction support services for all types of facilities including commercial, educational, government, industrial, institutional, medical, recreational and residential. *Schaaf & Wheeler has worked with Fehr Engineering on multiple sanitary sewer pump station upgrade and replacement projects in the recent past including 3 pump stations for the City of San Mateo, 5 pump stations for the City of Alameda, and 5 pump stations for the City of Fontana.*

Pacific Crest Engineering, Inc. – Geotechnical Engineering. Pacific Crest Engineering (PCE) is a local firm providing full service geotechnical, materials testing, special inspection and environmental engineering consulting services to the public and private sectors. Pacific Crest is a certified woman-owned DBE (#41551) and Small Business (#47199) with the State of California. The firm is also recognized by the Joint Utilities as a certified Women Business Enterprise (#15060114).

PCE's range of geotechnical and environmental services provided include the following:

- Geotechnical and Geologic Investigations
- Construction Phase Observation and Testing Services
- Special Inspection - Soil, Asphalt, Steel & Concrete
- SWPPP & Erosion/Sediment Control Monitoring
- Phase 1 Environmental Site Assessments
- Groundwater Sampling and Monitoring
- Laboratory Services
- Infiltration Testing
- Forensic Engineering
- Slope Stability Studies
- Coastal Engineering Investigations
- Soil and Groundwater Remediation

Pacific Crest's laboratory is certified by Cal-Trans and AMRL for soils and aggregate, and Cal-Trans and (pending) CCRL for concrete. Their engineers are well experienced in municipal work, including performing on-call geotechnical engineering services for the the County of Monterey, County of Santa Cruz, the City of Watsonville and the University of California, among others. *Schaaf & Wheeler has worked with PCE on numerous projects, including the Pure Water Monterey Groundwater Replenishment Project, the Soquel Creek Water District Water Line Creek Crossing Project, and the Morgan Hill Sanitary Trunk Sewer Main*.

Key Personnel

We have assembled a robust, multi-disciplinary team for the District to provide the right combination of skills required for the On-Call services. Schaaf & Wheeler is an "all water" civil engineering firm with focus on wastewater, stormwater and water infrastructure projects. Schaaf & Wheeler has the resources and experience needed for the sanitary sewer infrastructure project types identified in the District's CIP list.

Andrew A. Sterbenz, P.E. – Project Manager - The team will be led by **Andrew A. Sterbenz, PE** - Andy is a project engineer and owner of Schaaf & Wheeler, with more than 25 years of experience in water related projects. Andy has led multi-disciplinary teams for water supply, wastewater, and drainage projects from planning through construction. As the full-time District Engineer for the Marina Coast Water District, Andy has managed a $150 million water and sewer capital improvements budget that included numerous sewer improvements for the former Fort Ord. He is currently working on implementation projects for the Pure Water Monterey Groundwater Replenishment Project.

Andy will be the overarching project manager handling all the projects coming from the District. *The type of project will determine the engineers committed for each project. Andy will be responsible for day-to-day project*

management for the entire duration of the project. He will maintain the project schedule and budget and assume ultimate responsibility for the quality of all work products as the engineer of record. He will hold regular team meetings to make sure issues are resolved *effectively and to allocate resources to critical tasks.*

Peder C. Jorgensen, P.E. – Principal-in-Charge and QA/QC- Peder is the executive vice president and owner at Schaaf & Wheeler. He will provide peer review along with quality assurance. Peder brings forth more than 30 years of experience in wastewater, potable water, and recycled water distribution and delivery systems. Having worked on some 200 such projects during his 35 years in the civil engineering practice, he has served as project manager and principal designer of gravity sewers, sewage lift stations, booster stations, stormwater pumping stations, water mains, fire deluge stations, deep well turbines, reservoirs and open channels, for public agencies throughout Bay Area. Peder has extensive knowledge of the MCWD water system, having worked on the design of wells 10, 11, 12, 34 and 35, Reservoirs 2 and D1,the Marina-Ord Inter-tie and the District's pilot desalination plant. He provided the District's input to and review of the modeling for the 2006 Water Systems Master Plan.

Other Key Team Members

Modeling Lead - Leif M. Coponen, P.E. Leif is a vice president and owner at Schaaf & Wheeler. Leif brings forth in-depth understanding of analysis and design of water and wastewater infrastructure projects. He has more than 14 years of experience leading multi-disciplinary teams for potable water projects right from assessment through design and construction. He has designed cost-effective water supply and distribution systems for private developments and public agencies across the Bay Area. Leif regularly provides CEQA support for water and wastewater CIPs and public works projects. His project management skills and in-depth knowledge of the design and analysis of both new and rehabilitated potable water, stormwater and sanitary sewage systems and pumping stations has always been a major factor for repeat clientele. Leif has expertise in modeling water systems with Bentley's WaterCAD, and Innovyze's H2Omap, InfoWATER and InfoSWMM software platforms. Leif is currently providing On-Call Wastewater and Water Modeling Support to the City of Mountain View. Leif has extensive experience working on projects for MCWD since 2002, including the Marina-Ord inter-tie project, system modeling, system map updating, land development infrastructure review, capital project design of pipelines, wells, and preliminary design of storage reservoirs and booster pump stations. He also updated the District's wastewater collection system model in H2O Map to analyze a proposed development

Pump Station Lead - Glen M. Anderson, P.E. Glen is an owner and senior engineer at Schaaf & Wheeler. He has 10 years of experience in potable water, sanitary sewer system, and storm water assessment and design as well as the associated construction support and management associated with those projects. Glen has worked on numerous sanitary sewer pump station rehabilitation projects throughout the Bay Area. Additionally, Glen has performed condition assessments for more than 120 sanitary sewer and storm water pump stations. Glen's potable water experience projects include the assessment and rehabilitation of booster pump stations, design of a water tanks and planning and design for potable water wells and pipelines. In addition to design, Glen has provided design, construction support and management services for a variety of projects, including wells, pipelines, storage tanks, pump stations, and generator installations.

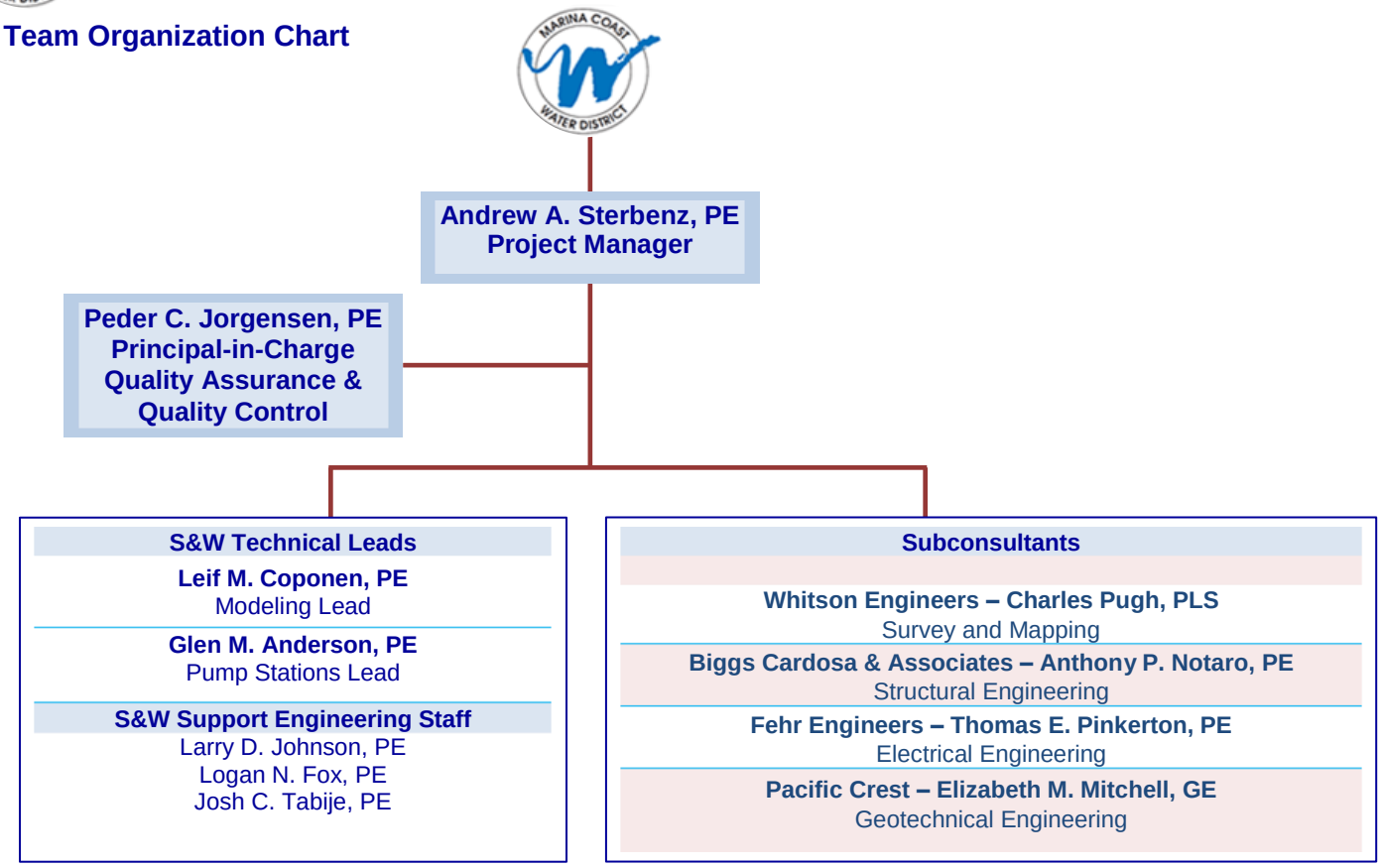
The following tables present qualifications and experience key team personnel. Resumes presenting detailed qualifications, experience, and relevant projects are included after the Team Organization Chart.

Team Member Qualifications and Experience

Name and Role	Education	License/Certification	Years of Experience	Availability
Andrew A. Sterbenz, PE -Project Manager	MSCE, University of Texas, San Antonio BSCE, Massachusetts Institute of Technology	Registered Civil Engineer, California C69703 Texas 93537	25+	35%
Peder C. Jorgensen, PE - Principal-in-Charge/QAQC	MSCE, San José State University BSCE, San José State University	Registered Civil Engineer California C29322 Washington 36378	30+	20%
Leif M. Coponen, PE - Modeling Lead	BSCE, Michigan Technological University, Michigan	Registered Civil Engineer, California C70139	15+	25%
Glen M. Anderson, PE, PACP - Pump Station Lead	BSCE, Civil and Environmental Engineering, University of California, Davis Hydraulic Institute, Pump System Assessment Certified	Registered Civil Engineer California C76720 NASSCO PACP Cert. U-714-06021855	10+	25%
Logan N. Fox, PE - Project Engineer	BSCE, Santa Clara University MSCE, San Jose State University	Registered Civil Engineer California C84797	5+	40%
Lawrence D. Johnson, PE - Project Engineer	BSCE, California Polytechnic State University, San Luis Obispo MS Civil and Environmental Engineering, California Polytechnic State University, San Luis Obispo	Registered Civil Engineer California C84183	5+	40%
Josh C. Tabije Project Associate	BSCE, Colorado State University Continuing Education, Construction & Energy Management, Cabrillo College		10+	40%
Subconsultants				
Charles Pugh, PLS - Survey & Mapping – Whitson Engineers	B.S. – Earth Systems Science and Policy CSU at Monterey Bay, Seaside, California	California Licensed Land Surveyor In #9167	13+	30%
Anthony P. Notaro, PE - Structural Engineer Biggs Cardosa & Assoc.	BSAE, California Polytechnic State University, San Luis Obispo Engineer Officers Basic Course, United States Army Corps of Engineers	Registered Civil Engineer California C51739	25+	30%
Thomas E. Pinkerton, PE - Electrical Engineer - Fehr Engineers	Graduate of University of Nebraska, BSEE Registered	California License E14906 Nebraska License E10250 Texas License 99157 Arizona License 50269	25+	30%
Elizabeth M. Mitchell, GE - Geotechnical Engineer - Pacific Crest	MS, Civil Engineering, San Jose State University BS, Industrial Engineering, California Polytechnic State University, San Luis Obispo	California Registered Geotechnical Engineer – GE 2718 California Registered Civil Engineer - C 58578	27	30%

Detailed résumés are in this document after the Organization Chart.

Team Organization Chart



Resumes

Andrew A. Sterbenz, P.E. – Project Manager – Schaaf & Wheeler

Education
BSCE, Massachusetts Institute of Technology

MSCE, University of Texas at San Antonio

Licenses
Registered Civil Engineer
California C69703
Texas 93537

Affiliations
American Water Works Association

Society of American Military Engineers

American Public Works Association

Monterey Bay Water Works Association

Andrew A. Sterbenz, P.E. has over 25 years of experience managing engineering organizations and solving engineering problems, and is recognized for developing and implementing creative solutions to complex problems. In 2006-2007 and 2012-2013 he served as the full-time District Engineer for the Marina Coast Water District, managing a $150 million water and sewer capital improvements budget that includes the development of new groundwater, recycled and desalinated water supplies for the former Fort Ord. He has prepared long-range water supply plans in California and Texas. Plans include the projection of population and water demands, the assessment of current water supply availability, and the analysis of water management strategies to meet projected shortages. He is adept at analyzing, researching, planning, coordinating and executing strategies to achieve organizational goals. Andy has prepared detailed plans and specifications for bidding and construction for public agencies, and managed construction projects for the client agencies. He has conducted environmental studies and remediation design, and assisted with environmental permitting. He is well experienced with state and federal environmental regulations.

Relevant Projects

Wastewater and Water Systems Planning and Design

Anderson Dam Seismic Retrofit Project, Project Management Team – Black & Veatch for Santa Clara Valley Water District – Morgan Hill, CA (2012 – Present)
Pure Water Monterey Injection Well Field – Kennedy/Jenks Consultants for MRWPCA - Monterey County, CA (2016-Present)
Reclamation Ditch Diversion Pump Station – E2 Consulting Engineers for MRWPCA - Monterey County, CA (2016-17)
Lightfighter Drive Water Main – Marina Coast Water District – Seaside, CA (2016)
San Juan Oaks Water and Wastewater System Design – Whitson Engineers – Hollister, CA (2015-16)
Pure Water Monterey Groundwater Replenishment Project – MRWPCA – Monterey County, CA (2015-17)
Truck Yard Lift Station and Water System Improvements – Monterey Regional Waste Management District – Marina (2014-16)
Pure Water Monterey Groundwater Replenishment Project – Denise Duffy & Assoc. – Monterey County, CA (2013-2015)
Reclamation Ditch Yield Study – Monterey Penninsula Water Management District - Monterey County, CA (2013-2014)
Blanco Drain Yield Study – Monterey Penninsula Water Management District - Monterey County, CA (2013-2014)
Aptos Booster Pump Station – Soquel Creek Water District – Aptos, CA (2012-2015)
McGregor Drive Booster Pump Station – Soquel Creek Water District – Capitola, CA (2012-2015)
Interim District Engineer - Marina Coast Water District - Marina, CA (2006-2007, 2012-2013)
Soquel Drive Cast Iron Main Replacement-Soquel Creek Water District-Soquel, CA (2012)
Watkins Gate Well and Pipeline– Marina Coast Water District – Marina, CA (2011-2012)
Stonegate Water Supply Project – San Benito County Public Works - Hollister, CA (2011-2013)
Castroville Community Plan Infrastructure Estimate – Monterey County Redevelopment Agency – Monterey, CA (2009-2010)
Sewer Feasibility Study for Commercial Parkway – Monterey County Redevelopment Agency – Castroville, CA (2010)
Boronda Meadows General Development Plan Peer Review – PMC, Inc. – Salinas, CA (2010)
Raw Water Pump Station Design and Construction - Coastal Water Authority - Houston, Texas (2000)
Moses Bayou 84-Inch Siphon & System Water Audit - Gulf Coast Water Authority - Texas City, Texas (1999 - 2001)
Modular Wastewater Treatment System - LOGCAP – Balkans, Yugoslavia (1999)

Water Supply Planning

Water Supply Assessment for 2018 General Use Permit – Stanford University (2016-17)
2015 Urban Water Management Plan – Marina Coast Water District – Marina, CA (2015--2016)
2010 Urban Water Management Plan – Marina Coast Water District – Marina, CA (2010-2011)
Regional Urban Water Augmentation Project - Marina Coast Water District - Marina, CA (2006-2007)
Region H Water Plans (2001 and 2006) - San Jacinto River Authority - Conroe, Texas (1998-2001, 2002-2006)
Colorado River Water Availability Model - Texas Natural Resource Consv. Comm. – Austin, TX (2002)

Stormwater Planning and Design

Bryant Canyon Channel – Monterey County Water Resources Agency – Soledad, CA (2013 –2014)
Wrigley-Ford Creeks Maintenance Project – City of Milpitas – Milpitas, CA (2011-2012)
Reclamation Ditch Repair at Alisal St – Monterey County Water Resources Agency – Salinas, CA (2009)
Pajaro River Levee Maintenance Design – Monterey County Water Resources Agency – Salinas, CA (2009)

Peder C. Jorgensen, P.E. – Principal-in-Charge/QAQC - Schaaf & Wheeler

Education
BSCE, San José State University

MSCE, San José State University

Licenses
Registered Civil Engineer

California C29322
Washington 36378

Affiliations
American Water Works Association

American Council of Engineering Companies

Peder C. Jorgensen, P.E., has over 30 years of engineering expertise, including considerable experience as project manager for utility master planning and design projects that combine civil, mechanical, structural, and electrical engineering elements. He has served as project manager and principal designer of numerous water mains, booster stations, fire deluge stations, deep well turbines, tanks, and pneumatic pressure systems. Coupled with his master planning experience, Peder's background provides an excellent combination of design and construction support projects. He has a comprehensive understanding of the timing and procedures necessary to prepare budgets, schedules, construction drawings, and specifications. Mr. Jorgensen is the engineer for the Great Oaks Water Company, a position he has served for more than 30 years.

Relevant Projects

Wastewater Systems

Sanitary Sewer Rehabilitation and Replacement Projects – City of Belmont (2015-2016)
Assessment and Engineering for Sanitary Sewer Main Rehabilitation – City of San Mateo (2016)
Lift Station D, F, J, K, & W (50 - 250 gpm) – City of Morgan Hill (2015-2016)
PSQ Reserve Flow and URD Project – East Bay Municipal Utility District (2014 - 2017)
Cabrillo Avenue Sewer Main Abandonment and Replacement – City of Santa Clara (2014)
Sanitary Sewer Pump Station Repairs – City of Fontana (2016)
Lift Staiton M (150 gpm) – City of Morgan Hill (2012)
Mariner's Island Sewage Pump Station No. 5 (522 gpm) – City fo San Mateo (2010)
Kingridge Sanitary Sewer Improvement Plans (3,100 feet) – City of San Mateo (2010)
Kingridge Sanitary Sewer Line Study – City of San Mateo (2009)
Trunk Sewer No. 2, Phase 1A (30-inch, 11,100 feet) – City of Morgan Hill (2006)
Edenvale Sanitary Interceptor (66 in.) – City of San Jose (1989)

Water Supply and Delivery Systems

Saratoga Wildlife Care Center Water Planning Project - The Lawrence Ellison Foundation (2017)
Richmond Water Line – 3775 ft, 16 & 18-inch PVC & HDPE - Great Oaks Water Line (2016)
Cherry Creek Water Pump Station Design (1,000 gpm) – Town of Hillsborough (2017 – 2018)
Probation Tank Replacement (0.5 MG) - Mesiti-Miller Engineering, Inc./San Lorenzo Valley Water District (2015-17)
Fire Tank Supply Alternatives, Camp Saratoga (50,000 Gallon) - Todd Nelson/ Basin Construction Company (2015-16)
Communications Hill Housing Development (11,600 ft of 8-, 6-, and 4-inch waterline, 26 fire hydrants, 18 fire services and 327 water services) – KB Homes (2014-2015)
Assessment of 28 Grounwater Wells – City of Santa Clara (2014)
Country View Tank (90,000 Gallon) – Great Oaks Water Company (2014-2018)
iStar Water System Improvements (5,300 feet of 12- and 8-inch waterline, 25 fire hydrants, and 3 irrigation services);
San Vicente Water Line (2,800 feet of 12-,10-, 8- and 6-inch waterline and 10 services) - Great Oaks Water Company (2015 & 2014)
Watkins Gate Well and Pipeline (2,000 feet of new 24-inch water pipeline) – Marina Coast Water District (2011)
Aptos Pump Station & Mc Gregor Pump Station – Soquel Creek Water District (2012 – 2014)
San Jerardo Well Replacement and Storage (0.3 MG) - Monterey County Public Works (2010)
Highlands Distribution System, Booster Station and Storage Reservoir – San Jose Water Company (2005 – 2009)
Skyfarm 3 and Tournament Pump Stations (800 gpm) – CSG Consultants/Town of Hillsborough (2009 – 2013)
Municipal Water Wells (1,500 & 1,900 gpm @ 1500 & 1700 ft) – Marina Coast Water District (2006 – 2012)
Water Mains, Pump Stations and Tanks; 70 Development Projects - San Jose Water Company (1991 – 2012)
Sequnda Pump Station Rehabilitation (7,000 gpm) – California American Water Company (2009)
Begonia Iron Remodel Plant Modifications – California American Water Company (2008 – 2009)
Edmundson Tank (4.0 MG), Boys Ranch Reservoir (1.0 MG) – City of Morgan Hill (2001 - 2006)
Soledad Well 11 (1,910 gpm), City of Soledad (2003-2004)
Batista Reservoir (1.8 MG) & Pressure System (5,500 GPM) – KB Home/San Jose Water Company (2002 – 2003)
Ord Community Valve Replacement – Marina Coast Water District (2002 – 2003)
Montevina Pipeline 42 in. – San Jose Water Company (2001)
Well Field Modifications (4 wells, 1800 – 2500 gpm) – Fort Ord Reuse Authority (2001)

Peder C. Jorgensen, P.E. – Principal-in-Charge/QAQC - Schaaf & Wheeler

Central Pipeline Relocation (66-inch raw water) – Santa Clara Valley Water District (1993)
Stormwater Systems Planning and Design
Baylands Stormwater Pump Station No. 2 – City of Sunnyvale (2013 – 2017)
Marsten Storm Drain Pump Station (284 cfs) – City of Burlingame (2010-2012)
Blanco Drain Stormwater Pump Station – Monterey County Water Resources Agency (2008)
San Francisquito Creek Stormwater Pump Station - City of Palo Alto (2008)
Hope Street Stormwater Pump Station - City of San Jose (2007)
Alviso Storm Drain Evaluation – City of San Jose (2006-2007)
Cochran Road Retail Detention Basin & Pump Station – RSC Engineers (2005-2006)
Hill Road and Dunne Avenue Storm Drain Evaluation – City of Morgan Hill (2004-2006)
Wrigley Ford Stormwater Pump Station (432 cfs) – Santa Clara Valley Water District (1993-1998)
Coast Casey Pump Station (140 cfs) – City of Mountain View (1995)
Recycled and Reclaimed Water
South County Recycled Water Pipeline Project Peer Review - Santa Clara Valley Water District (2016)
Desalination Plant – Marina Coast Water District
Customer Retrofit (50 sites) – South Bay Water Recycle Program (1997-2001)

Leif M. Coponen, P.E. – Modeling Lead - Schaaf & Wheeler

Education
BSCE, Michigan Technological University, Michigan

Licenses
Registered Civil Engineer California C70139

Affiliations
American Water Works Association

North American Society of Trenchless Technology

Pipe Users Group - NorCal

Leif M. Coponen, P.E., has more than fifteen years of experience in water, waste water and storm water systems engineering. He has designed cost-effective water supply and distribution systems for private developments and public agencies across the Bay Area. Leif regularly provides CEQA support for water and wastewater CIPs and public works projects. His project management skills and in-depth knowledge of the design and analysis of both new and rehabilitated potable water, stormwater and sanitary sewage systems and pumping stations has always been a major factor for repeat clientele. Leif has expertise in modeling water systems with Bentley's WaterCAD, and Innovyze's H2Omap and InfoWATER INFOSWMM software platforms. Leif is also skilled at preparing detailed plans and specifications for bidding and construction of infrastructure projects for public agencies, and providing construction support services.

Relevant Projects

Potable Water Planning and Design
Modeling, Sizing and Design of Water System for San Juan Oaks Development, Whitson Engineers
750 Moffett Boulevard – Moffett Gateway Water Supply Assessment, David J. Powers & City of Mountain View
El Camino Hospital Campus Project – Water Supply Assessment, David J. Powers & City of Mountain View
North Bayshore Precise Plan - Water & Wastewater System Planning, City of Mountain View
On-Call Water and Wastewater Modeling Support, City of Mountain View
Castroville Seawater Intrusion Project, Espinosa Booster PS Modifications & System Assessments - MCWRA
On-Call Water and Wastewater Modeling Support, Marina Coast Water District
Reservation Road Pipeline Project, Marina Coast Water District
Watkins Gate Well and Pipeline Project, Marina Coast Water District
Well 34 Site Improvements, Marina Coast Water District
California Avenue Extension Pipeline Project, Marina Coast Water District
Bayer Tank Structural / Marina-Ord Inter-Tie Project, Marina Coast Water District
Communications Hill Water Distribution System, KB Home/San Jose Water Company
Coyote Road Pump Station, Great Oaks Water Co.
East Palo Alto General Plan Update, City of East Palo Alto
Service Area 3 Planning Study, Soquel Creek Water District

Sanitary Sewer Planning and Design
Leong Drive Sewer and Water Main Design, City of Mountain View
Shoreline Sewage Lift Station Assessment and Trunk Sewer Alignment & Constructability, City of Mountain View
South Trunk Sanitary Sewer Relief Line, City of San Mateo
Sanitary Sewer Master Planning and Design Review, Marina Coast Water District

Recycled Water Systems
Pico Power Plant Recycled Water Distribution, Silicon Valley Power
Smurfit-Stone Recycled Water Retrofit, City of Santa Clara
Intel Co. Recycled Water Retrofit, City of Santa Clara

Sanitary Sewer Pump Stations
Aquatic Park, Mariner's Island #5 and #6 Sanitary Sewer Pump Station Rehab, City of San Mateo
Spreckels Subdivision Sanitary Sewer Pump Station, Standard Pacific Homes
Mariner's Island No.2 Sanitary Sewage Pump Station Rehabilitation, City of San Mateo
S. San Francisco Industrial Sewage Pumping Stations No.3 and No.4 Rehabilitation, City of South San Francisco

Storm Water Pump Stations
Marsten Storm Drain Pump Station, City of Burlingame
Baylands Stormwater Pump Station No.1 Rehabilitation, City of Sunnyvale
Matadero Creek Pump Station, City of Palo Alto
San Francisquito Creek Stormwater Pump Station, City of Palo Alto
Coyote Point and Poplar Avenue Stormwater Pump Station Rehabilitation, City of San Mateo
Santa Rita Storm Water Pump Station, Monterey County Water Resources Agency
Spreckels Subdivision Stormwater Pump Station, Standard Pacific Homes

Glen M. Anderson, P.E. – Pump Station Lead - Schaaf & Wheeler

Education
BSCE, Civil and Environmental Engineering, University of California, Davis

Licenses
Registered Civil Engineer
California C76720

Certifications
NASSCO PACP, MACP and LACP Certified No. U-714-06021855
Hydraulic Institute, Pump System Assessment Certified

Affiliations
Peninsula Water Works Association – Vice President
Pipe Users Group - NorCal

Glen M. Anderson, P.E., has 10 years of experience in potable water, sanitary sewer system, and storm water assessment and design as well as the associated construction support and management associated with those projects. Glen has successfully completed work on several sanitary sewer main and trunk rehabilitation projects. He has worked on sanitary sewer pump station rehabilitation projects throughout the Bay Area. Additionally, Glen has performed condition assessments for more than 120 sanitary sewer and storm water pump stations. Glen's potable water experience projects include the assessment and rehabilitation of booster pump stations, design of a water tanks and planning and design for potable water wells and pipelines. In addition to design, Glen has provided design, construction support and management services for a variety of projects, including wells, pipelines, storage tanks, pump stations, and generator installations.

Relevant Projects

Wastewater Systems

City of San Mateo Basin 2/3 – Pump Station Alternatives – MWH/City of San Mateo (2016)
Lift Stations J&K and D, F & W – City of Morgan Hill (2016)
Sanitary Sewer Rehabilitation and Replacement Rehabilitation Projects, City of Belmont (2015 - 2016)
Assessment and Engineering for Sanitary Sewer Main Rehabilitation, City of San Mateo (2014 -2015)
Shoreline Sewage Lift Station Condition and Risk Assessment and Alternative Trunk Sewer Alignment and Constructability Study, City of Mt. View (2015 - Ongoing)
Pump Station Q and Ettie Street Pump Station Project, East Bay Municipal Utility District (2014-2015)
Force Main Appurtenance Projects ESDC, Ross Valley Sanitary District (2014-2015)
Cabrillo Avenue Sewer Main Abandonment and Replacement, City of Santa Clara (2013 – 2014)
Northside & Rabello SSPS Bypass & Meter Relocation, City of Santa Clara (2013 – 2014)
South Trunk Sewer Relief Line, City of San Mateo (2013 – In Design)
Madera Lift Stations, County of Madera (2014-2015)
Mariner's Island No. 5 and No. 6 Pump Station Rehabilitation, City of San Mateo (2011)
Sanitary Sewer Pump Station Repairs, City of Fontana (2012)
Pump Station Rehabilitations, City of Alameda (2012)
Sanitary Sewer Lift Station M, (2010); Morgan Hill Trunk Sewer No. 2, City of Morgan Hill (2006)
S. San Francisco Sanitary Sewer Pump Station No. 4 & No. 8 Rehab, City of S. San Francisco (2006, 2010)
City of San Mateo Sanitary Sewer Pump Station Assessment, City of San Mateo (2010)

Water Delivery Systems

Aptos and Mc Gregor Pump Stations, Soquel Creek Water District (2012 – 2014)
Great Oaks Water Company, Water System Modeling (2013)
Watkins Gate Well and Pipeline Project and Well 34 Site Improvements, Marina Coast Water District (2012)
Stonegate Water Supply Project, County of San Benito (2011)
San Jerardo Water System Improvements, County of Monterey (2010)
Segunda Pump Station Pump replacement, California American Water (2009)
Valley Christian School Pump Station Rehabilitation, Valley Christian School (2008)
El Torro Wells, California American Water (2008)
Shady Lane Water System Improvement Plans - Harris Construction (2006)

Stormwater Systems

Mechanical Engineering Services – Bayfair Hall Pumps, Paru Pump Station, City of Alameda (2015-2016)
Baylands Storm Water Pump Station No. 2, City of Sunnyvale (2015)
Chrysler Drive Pump Station Rehabilitation, City of Menlo Park (2015)
Marsten Pump Station, City of Burlingame (2011)
San Francisquito Creek Storm Water Pump Station, City of Palo Alto (2008)
Blanco Drain Storm Water Pump Station, Monterey County Water Resources Agency (2008)
Hope Street Storm Water Pump Station, City of San Jose (2007)
Baylands Storm Water Pump Station No. 1, City of Sunnyvale (2006)

Lawrence D. Johnson, P.E. – Associate Engineer - Schaaf & Wheeler

Education

BSCE, Civil Engineering, California Polytechnic State University, San Luis Obispo

MS, Civil and Environmental Engineering, California Polytechnic State University, San Luis Obispo

License

Registered Civil Engineer
California #84183

Lawrence D. Johnson, PE, has experience with hydraulic systems, urban water systems, groundwater hydraulics, open channel hydraulics, water wells and pumps and G.I.S. applications to water resources. Larry is proficient in various water modeling software including: WaterCAD, StormCAD, Culvertmaster, and Flowmaster. He is also has proficient in other modeling software including: AutoCAD, ArcGIS, FLO-2D, EPANET, EPASWMM, MODFLOW, HEC-RAS, HEC-HMS, HEC1, and HEC2. Larry also has experience in water transmission systems and specifications review from his time at the Sonoma County Water Agency.

Relevant Projects

Hydraulics and Hydrology
16770 Monterey Road Flood Study – City of Morgan Hill (2016)
Laurel Creek Hydraulic Modeling – City of Hillsdale (2016)
Centre Point Drive Flood Analysis and FEMA Applications – Milpitas (2015-2016)
Saratoga Creek Trail Hydraulics Impacts – City of Santa Clara (2015-2016)
Lower Penitencia Creek Improvements Project – Wood Rogers/SCVWD (2015-2016)
Llagas Creek Flood Protection Study – Santa Clara Valley Water District (2015-2016)
Sanitary Sewer Rehabilitation Modeling – City of Belmont (2015-2016)
Airport Flood Protection Study – City of Livermore (2015)
KB Homes, Piper Drive Floodplain Analysis and FEMA Applications – Milpitas (2014-2016)
Lennar Homes, 450 Montague Flood Analysis and FEMA Applications – Milpitas (2014-2016)
San Tomas Aquino Creek Flood Study – City of Santa Clara (2014)
Permanente Creek and McKelvey Park Pump Station - Mountain View (2014)
CSIP Water Transmission System Analysis – Monterey County (2014)
Zone 7 Watershed Hydrology and Hydraulics – Zone 7 Water Agency (2014)
McCandless Drive Flood Analysis and CLOMR Appliation – Milpitas (2013-2014)
Silicon Valley BART Extension Floodplain Analysis - Santa Clara Valley Transportation Authority (2013)
Pump Stations
Centercal “The Veranda” Stormwater and Sanitary Sewer Pump Station – City of Concord (2016)
DCT Industrial Stormwater Pump Station – City of Tracy (2016)
Santa Clara Square Phase 2 Stormwater Pump Stations – Santa Clara (2016)
Sanitary Sewer Pump Station & Trunk Alternative Study – City of Mountain View (2015)
Home Ranch Pump Station – RJA/City of Gilroy (2015-2016)
Gippetti Pump Stations – RJA/City of Gilroy (2015-2016)
Sanitary Sewer Pump Station Rehabilitation – CSA 2A and 2B, Bass Lake – County of Madera (2014-2016)
Santa Clara Gateway Pump Station Review (2 Pump Stations) – Santa Clara (2013)
Water Delivery Systems
Fire Flow Analyses for Great Oaks Water Company – Great Oaks Water Company (2014-Present)
The Dunes Phase I-VI Water System Modeling – Marina Coast Water District (2015-2016)
Thesis Project: Water Distribution Contaminant Transport Analysis – Cal Poly (2012)
Advanced Disinfection Study - Sonoma County Water Agency (2011)

Logan N. Fox, PE – Associate Engineer - Schaaf & Wheeler

Education
BS, Civil Engineering, Santa Clara University

MS, Civil Engineering, San Jose State University

Licenses
Registered Civil Engineer
California #C84797

Logan N. Fox, PE has considerable experience in capital improvement projects as well as hydraulic and hydrology studies. He provides design support and prepares plans and specifications for wastewater, water and stormwater delivery projects. Logan also has in-depth knowledge of design and modeling software including: AutoCAD, ArcGIS, WaterCAD, StormCAD, SewerCAD, HEC-RAS, and HEC-HMS.

Relevant Projects

Wastewater Systems
San Juan Oaks Pump Station and Forcemain – Whitson Engineers/Del Webb (2016 – In Design)
Lift Station J and K Rehabilitation – City of Morgan Hill (2016 – In Design)
42nd Avenue Sanitary Sewer Pump Station - City of San Mateo (2015)
Crown Merrill Sanitary Sewer Pump Station Replacement - Mesiti Miller/UC Santa Cruz (2016)
Cabrillo Avenue Main Replacement – City of Santa Clara (2013 – 2014)

Water Delivery Systems
San Juan Oaks Water Storage Tanks – Whitson Engineers/Del Webb (2016 – In Design)
Gilroy Pump Station No. 5 Improvement – RJA/City of Gilroy (2015 – In Design)
Probation Tank Replacement – San Lorenzo Valley Water District (2015 – In Design)
Camp Saratoga Water System – Camp Saratoga (2014 – 2015)
Well 30 Pump Replacement – Marina Coast Water District (2015)
Conservation Center for Wildlife Care – Lawrence Ellison Foundation (2014)
Well 5-02 Improvement – City of Santa Clara (2014)
Assessment of City Wells – City of Santa Clara (2014)
Pressure Reducing Valve Replacement – Valley Christain School (2014)
McGregor Drive Pump Station – Soquel Creek Water District (2013 – 2015)
Aptos Pump Station – Soquel Creek Water District (2013 – 2015)
Hydropneumatic Tanks – Town of Hillsborough (2013)
Northside Tanks Rehabilitation – City of Santa Clara (2013)
Winchester Main Replacement – City of Santa Clara (2013)

Stormwater Systems
Poplar Avenue Pump Station Replacement – City of San Mateo (2014 – In Design)
Rollins Area Pump Station – City of Burlingame (2014)
Stormwater Conveyance Facility Inventory and Analysis, and Prioritized Repair/Replacement Program – Town of Woodside (2014 – 2015)
Westside Detention Basin Desilting – City of Santa Clara (2013 – In Design)
Baylands Storm Water Pump Station No. 2 Rehabilitation – City of Sunnyvale (2013 – 2016)
US-101 Storm Drain Crossing Feasibility Study – City of Burlingame (2013)

Hydraulics and Hydrology
Moraga Storm Drain Master Plan – Town of Moraga (2015)
Old Canyon Road Bridge Foundation Repair – City of Fremont (2015)
Westside Retention Basin Alternative Analysis – City of Santa Clara (2014)

Josh C. Tabije – Assistant Engineer - Schaaf & Wheeler

Education
BSCE, Colorado State University

Continuing Education, Construction & Energy Management, Cabrillo College

Affiliations
American Society of Civil Engineers

Josh C. Tabije has 10 years of experience in the areas of flood control and drainage, creek restoration, water distribution and supply, and physical and numerical modeling with HYDRA. In each of these areas, Josh has been involved in site assessment, feasibility studies and construction document preparation. More recently, Josh has been providing construction management, Assistant Resident Engineer and Interim Resident Engineer responsibilities for two projects for the Marina Coast Water District. He is also proficient in HYDRA 6.0, HEC-RAS, StormCAD, FlowMaster, and HEC-2.

Relevant Projects

Water Delivery Systems
Reservation Road Pipeline – Marina Coast Water District
Soquel Drive Cast Iron Main Replacement - Soquel Creek Water District
Oakhill Rd. & Poplar St. Main Replacement - Soquel Creek Water District

Construction Management & Inspection
City of San Mateo Levee Inspection - City of San Mateo
Chualar Sanitary Sewer Rehabilitation - Monterey County Public Works
3rd Avenue Water Main Extension – Marina Coast Water District
New Garage – Castroville Community Services District
Marina Sewer Improvements Construction Management – Marina Coast Water District
D-E Reservoir & Hydro-pneumatic Pump Station Construction Management - Marina Coast Water District

Stormwater System Planning and Design
Palo Alto Storm Drain Master Plan - City of Palo Alto
Los Altos Storm Water Master Plan - City of Los Altos
Santa Cruz Storm Water Master Plan - City of Santa Cruz
Storm Drainage Design: Subwatersheds A8, B1, B4, C3 – California State University, Monterey Bay
CSUMB Stormwater Master Plan – California State University, Monterey Bay
Hollister Storm Drain Master Plan – City of Hollister
Castroville Storm Drain Improvements – Bestor Engineers
Cypress Point Country Club Storm Drain - Cypress Point Country Club

Water and Wastewater Systems Planning and Design
Reclamation Ditch Pump Station - Pure Water Monterey Groundwater Replenishment Project – Denise Duffy & Assoc. – Monterey County, CA
Potable Water System Improvements – Monterey Regional Waste Management District
Sewer Lift Station and Force Main - Monterey Regional Waste Management District
Water and Sewer System Maps - Marina Coast Water District
Plan Review - Marina Coast Water District
3rd Avenue Water Main Extension – Marina Coast Water District
George Chiala Farms Private Fire System Improvements - George Chiala Farms
George Chiala Farms Private Fire System Water Tank - George Chiala Farms
Sanitation Systems – Monterey County Public Works
Castroville Community Plan – City of Castroville
Pajaro Community Plan – City of Pajaro
Boronda Community Plan – City of Boronda
Fort Ord Valve Replacement Study – Marina Coast Water District

Floodplain Management
City of Santa Clara A99 LOMR – ANWest Inc.
Watsonville Slough Floodway – City of Watsonville
Rosehart Subdivision Floodplain Analysis – Mill Construction

Hydrology and Hydraulics
Santa Rita Creek Site Hydrology – Monterey County Flood Control
Orphan Residence Hydrology – John Lien Architecture
Gates Property Hydrology – Robert Dewitt Engineering
Highway 25 Hollister Bypass Drainage Design – Parsons Engineering

- River and Stream Enhancement

Wrigley and Ford Creeks Dredging Design
Iris Canyon Creek Reparation – City of Monterey

CHARLES PUGH, PLS | Land Surveyor WE WHITSON ENGINEERS

California Licensed Land Surveyor In #9167

EDUCATION: B.S. – Earth Systems Science and Policy
CSU at Monterey Bay, Seaside, California

QUALIFICATIONS:
Thirteen years of experience performing most types of general land surveying practices including: boundary, topographic, A.L.T.A., land division, photogrammetric control, mapping, construction staking and legal description preparation. Fifteen years of experience using Real-Time GNSS.

REPRESENTATIVE PROJECT EXPERIENCE:

- ***Santa Cruz County Sanitation District –*** *On Call Surveying Services* – Project specific topographic, boundary and construction staking for force main sanitary sewer, pump stations and fence construction.
- ***Santa Cruz County Sanitation District –*** *2006-2015 CIP* **–** Provided project topographic surveying for 12 miles of sewer force main replacement, aerial and supplemental ground surveys for multiple sewer replacement projects at various locations. Construction staking services for the Aptos Transmission Main project. Prepare legal descriptions and exhibits.
- ***Santa Clara Valley Transportation Authority*** *- State Route 152 Trade Corridor Project* – Provided aerial control and mapping for approximately 80 miles of route corridor mapping.
- ***Marina Coast Water District*** *– Well Lot 33* – Performed aerial mapping and surveying associated with pre-design planning.
- ***California Water Service*** *– Well Station 108* – Provided site topographic, boundary surveying and construction staking.
- ***Pebble Beach Community Services District*** *– Forest Lake Reservoir* – Provided construction staking and settlement monitoring of reservoir dam embankments.
- ***Golden State Vintners*** *– Wastewater Storage Tank* – Provided topographic surveying and construction staking for storage tank.
- ***Monterey County Water Resources Agency*** *– Salinas River Diversion Facility* – Provided construction staking and boundary surveying related to the diversion facility on the Salinas River.
- ***Monterey County*** *- San Jerardo Water System Aerial Topographic Mapping* – Provided aerial topographic mapping for the water transmission line corridor. Positioned record boundary based on existing monumentation.
- ***Carmel Area Wastewater District*** *– Reverse Osmosis Treatment Facility - Provided* construction staking for reverse osmosis treatment facility.
- ***Pebble Beach Community Services District*** *– On-Call Surveying* – On-call surveying for all PBCSD projects including topographic mapping, utility mapping, control surveys, boundary surveys and legal description preparation.
- ***City of Salinas Municipal Airport*** *– AIP 9, 11, 12 and Runway 13-31 Projects* – Managed site and Runway Surveying complying with FAA regulations in conjunction with airport improvements and resurfacing projects.
- ***Monterey Regional Waste Management District*** *– Landfill Gas Collection System* – Provided construction staking and as-built surveying for gas collection system at the Monterey Environmental Park.

PROFESSIONAL ORGANIZATIONS:
California Land Surveyors Association

Anthony P. Notaro, PE – Associate – Biggs Cardosa

Registration
Professional Engineer (Civil), State of California, C51739

Education
B.S. Architectural Engineering, California Polytechnic State University, San Luis Obispo, California
Engineer Officers Basic Course, United States Army Corp of Engineers

Mr. Notaro joined Biggs Cardosa Associates, Inc. in 1991. He has over 26 years of experience in structural engineering with an emphasis on transportation and infrastructure projects. He has been a Project Manager on numerous projects including new construction, rehabilitation and/or seismic retrofit of various pedestrian, vehicular, and rail bridge structures, retaining wall and soundwall structures, and various hydraulic structures including tanks, pump stations, junction boxes, floodwalls, drainage channels and creek trail facilities.

Responsibilities

Responsibilities as Associate include business development, project management, staffing, scheduling, budgeting, oversight of structural analysis and design of projects, development of construction details and specifications, production of contract documents, coordination with clients, contractors, and sub consultants, construction engineering support and field review of construction.

Project Experience

Fontana Pump Station Assessment and Rehabilitation, Fontana, CA: Project Manager for the structural assessment of six and rehabilitation of three sanitary sewer pump stations at various locations in the City of Fontana.

South San Francisco Pump Station No. 4, South San Francisco, CA: Engineering Manager for structural assessment and upgrade of an existing substandard concrete wet well and modification to the existing concrete and masonry sanitary sewer pump station building and site facilities.

South San Francisco Pump Station No. 1, 2 & 10, South San Francisco, CA: Engineering Manager for structural assessment and upgrade of three existing sanitary sewer buildings and site facilities.

South San Francisco Pump Station No. 3, South San Francisco, CA: Engineering Manager for structural assessment and upgrade of an existing concrete, masonry and timber sewage pump station building and site facilities.

Mariner's Island #2 Sewage Pump Station Rehabilitation, San Mateo, CA: Engineering Manager for structural assessment and upgrade of existing underground sewage pump station facilities.

Sanitary Sewer Junction Box C&D Rehabilitation, San Jose, CA: Engineering Manager for the rehabilitation of two sanitary sewer junction boxes connecting a total of 12 sewer lines ranging in size from 60 inches to 84 inches in diameter.

Baylands Stormwater Pump Station No. 2 Rehabilitation, Sunnyvale CA: Project Manager for the structural evaluation and subsequent rehabilitation of stormwater pump station facilities including a masonry mechanical/electrical building, multiple shaft below grade wet well and associated inlet and outlet structures and site retaining walls.

Marsten Pump Station Upgrade, Burlingame, CA: Engineering Manager for replacement of existing pump station facilities including Marsten wet well and discharge box, Easton Creek wet well and discharge box, maintenance bridge, underground junction structure, electrical building and site walls and generator slab.

Well 34 Building Rehabilitation Project, Marina, CA: Project Manager for the structural assessment of the existing out-of-service well building for potential rehabilitation and reuse in support of area developments.

Nelo Victor Pump Station, Santa Clara, CA: Engineering Manager for replacement of the existing substandard wet well and modification to the existing masonry and timber pump station building.

South Trunk Sanitary Sewer Relief Line, San Mateo, CA: Engineering Manager for the design of sanitary sewer junction boxes and miscellaneous structures including non-standard manhole structures, sanitary sewer siphon structures and modifications to existing Caltrans soundwall structures along Highway 101.

Thomas E. Pinkerton, PE #E14906 – CEO, Project Manager

Mr. Pinkerton has over twenty five years' experience as a Consulting Electrical Engineer. As the *Principal in Charge* of Fehr Engineering Company, Inc., he is responsible for all of day-to-day operations within the company. He provides complete electrical systems planning, design, construction documents, specifications, estimating, and construction support services for all types of facilities including public works, commercial, educational, government, industrial, institutional, medical, recreational and residential.

Notable projects include the recently completed East Garrison Sanitary Sewer Pump Station for the Marina Coast Water District, Blackburn Pump Station in Watsonville, Carbonera Lift Station in Scotts Valley, and Monterey Mushroom Lift Station in Orlando, Florida.

Principal-in-Charge since January 2003; responsible for all aspects of day to day operations within the company.

Over twenty years of experience in consulting electrical engineering involving power, lighting and electrical systems design and project management for both new construction and remodel-renovation projects.

Project management responsibilities include schedule control, design, construction document production, specification writing, cost estimating and control, and construction support.

Extensive experience in facility upgrades and maintenance, roadway and traffic signal improvements and infrastructure projects for both City and Governmental Agencies. His expertise includes electrical engineering design for all types of projects including airport runway and facilities, street lighting and traffic signals, building and site improvements and power distribution. His experience includes thorough inspection and assessment, load analysis and feasibility studies, as well as preparing detailed project reports and plans.

Specifically, Mr. Pinkerton has worked on several projects at the Monterey Regional Airport including design of the runway lights in 2003 and the airport terminal modernization design in 2004-2005.

Prior to joining Fehr Engineering, Tom was a facility engineer for the California Air National Guard (ANG), at NAS Moffett Field, where he developed and managed both new construction and renovation projects for ANG facilities at Moffett Field. Prior to that, he worked for General Electric as a test engineer for Missile Navigation Systems.

Tom has been associated with Fehr Engineering Company, Inc. since 1992.

Elizabeth M. Mitchell, GE

Principal geotechnical engineer

For the past 27 years, Ms. Mitchell has provided management, development and design for wide range of Santa Cruz County geotechnical engineering studies, including various industrial facilities, infrastructure, commercial buildings, schools and universities, water tanks and pipelines, forensic studies, light bridges, landslide repair, and single and multi- family developments. Her project experience has consisted of design and development of geotechnical investigation studies, with emphasis in the area of complex karst conditions, geotechnical analysis, coastal engineering, slope stability, liquefaction analysis, settlement analysis, identification and mitigation of structural pavement distress, expansive soil conditions, subsurface investigation and design of deep and shallow foundation systems. Many of these projects have required interaction with local and state regulatory agencies, including CalTrans, USACE, and the California Coastal Commission.

Relevant Experience

- City of Watsonville, *Manana Lane Sewer Replacement Project*. Project Geotechnical Engineer
- County of Santa Cruz, *D.A. Porath Facility Wet Weather Retention Basin Project*. Materials Testing
- Soquel Creek Water District, *Quail Run Tank Project*. Project Geotechnical Engineer.
- City of Watsonville, *Pajaro Levee Improvement Project,* Project Geotechnical Engineer
- E2 Consulting Engineers, *Salinas Pump Station*. Geotechnical Consultant.
- Harris & Associates, *Freedom Sanitation District Sewer Replacement Project*. Project Geotechnical Engineer.
- CDM Smith, *Monterey Regional Desalination Project,* Project Geotechnical Engineer.
- CSU Monterey Bay, *Storm Water Detention Infiltration Study*. Project Geotechnical Engineer.
- County of Santa Cruz, *Salsipuedes Creek Levee Stabilization Project*. Geotechnical Consultant.
- Salud Para La Gente. *Salud Para La Gente Clinic Expansion*, Phase II Environmental Study & Project Geotechnical Engineer.
- Monterey Mushrooms Inc., *Various Facilities,* Geotechnical Engineer and Environmental Consulting.
- University of California, Santa Cruz *Marine Science Campus Infrastructure Improvements*. Project Geotechnical Engineer.
- Soquel Creek Water District, *Bonita Well & Treatment Plant*. Project Geotechnical Engineer.

PACIFIC CREST ENGINEERING INC.
GEOTECHNICAL ENGINEERS

Education

MS, Civil Engineering, San Jose State University

BS, Industrial Engineering, California Polytechnic State University, San Luis Obispo

LICENSEs/ REGISTRATIONs

California Registered Geotechnical Engineer –GE 2718

California Registered Civil Engineer - C 58578

Certifications

ICC Soils Special Inspector No. 8029279-EC

Qualified SWPPP Developer and Practitioner (QSD/QSP) No. 20502

Water Treatment Operator, Grade T2

Water Distribution Operator, Grade D2

Qualifications and Training

Schaaf & Wheeler Experience and Capability

Schaaf & Wheeler has served municipal clients continuously throughout the 31-year history. Our engineers have collaboratively provided feasible designs for wastewater infrastructure to many public agencies throughout the Bay Area and Northern California. Given the proposed projects, we have assembled a team of specialists with extensive experience in sewer rehabilitation and replacement, pump station rehabilitation and replacement, drainage design, modeling and Capital Improvement Planning. We are well familiar with Caltrans practices, procedures, standards and regulations and have completed several projects in Caltrans right-of-way.

Our engineers provide On-Call wastewater engineering services for several municipalities and water districts throughout the Bay Area and the Central Coast, many of which are experiencing rapid growth. Following table presents our On-Call experience. These On-Call projects have included watersheds of all scales, land uses and geographic ranges. Our engineers perform planning level studies, complex hydraulic modeling, design and construction support for small and large sanitation engineering projects. This experience makes us an ideal engineering firm to assist County of Santa Cruz Sanitation District with the On-Call projects.

Our Team's Collaborative On-Call Experience in Last 5 Years.

Project Name	Client	Team
On-Call Engineering Services, 2003 - Present	City of San Mateo	Benjamin L. Shick, PE; Glen M. Anderson, PE; Charles D. Anderson, PE; Daniel J. Schaaf, PE; Emily D. Straley, PE
On-Call Water and Wastewater Engineering, 2006 – Present	Marina Coast Water District	Andrew A. Sterbenz, PE; Peder C. Jorgensen, PE; Leif M. Coponen, PE; Emily D. Straley, PE; Stephanie A. Tanverakul, PE; Josh C. Tabije, EIT
On-Call Engineering Services, 2014 – Present	City of South San Francisco	Caitlin J. Gilmore, PE; Charles D. Anderson, PE; Daniel J. Schaaf, PE; Robin J. Lee, PE;
On-Call Water and Wastewater Modeling, 2014 – Present	City of Mountain View	Leif M. Coponen, PE; Daniel J. Schaaf, PE; Emily D. Straley, PE; Stephanie A. Tanverakul, PE
On-Call Engineering Services, 2014 – present	Monterey Regional Water Pollution Control Agency	Andrew A. Sterbenz, PE, Josh C. Tabije, EIT;
On-Call Engineering Services, 2004 – Present	City of Livermore	Daniel J. Schaaf, PE; Charles D. Anderson, PE; Emily D. Straley, PE; Benjamin L. Shick, PE; Robin J. Lee, PE; Fidel T. Salamanca, PE
On-Call Services and Storm Drain Master Plan, 2015 –	City of Half Moon Bay	Daniel J. Schaaf, PE; Emily D. Straley, PE; Benjamin L. Shick, PE; Charles D. Anderson, PE
On-Call Engineering Services, 2007 – Present	City of Alameda	Benjamin L. Shick, PE; Daniel J. Schaaf, PE; Glen M. Anderson, PE; Charles D. Anderson, PE; Emily D. Straley, PE; Fidel T. Salamanca, PE
On-Call Flood Control Services, 2014 – Present	County of Napa	Daniel J. Schaaf, PE; Benjamin L. Shick, PE; Sarah Rahimi-Ardabily, PE; Fidel T. Salamanca, PE
On-Call Engineering, 2006 - Present	City of Morgan Hill	Peder C. Jorgensen, PE; Benjamin L. Shick, PE; Glen M. Anderson, PE
On-Call Engineering , 2011 – 2015	Soquel Creek Water District	Andrew A. Sterbenz, PE; Peder C. Jorgensen, PE; Leif M. Coponen, PE; Stephanie Tanverakul, PE, Josh C. Tabije
On-Call Engineering Services, 2006 – Present	City of Santa Clara	Peder C. Jorgensen, PE; Glen M. Anderson, PE; Benjamin L. Shick, PE; Charles D. Anderson, PE
On-Call Engineering Services, 2009 - Present	City of Belmont	Benjamin L. Shick, PE; Emily D. Straley, PE; Charles D. Anderson, PE
On-Call Engineering Services, 2006 – 2012	City of San Jose	Daniel J. Schaaf, PE; Emily D. Straley, PE; Fidel T. Salamanca, PE

Wastewater Systems and Infrastructure Planning, Design and Construction Support

Wastewater Planning and Modeling - Schaaf & Wheeler has completed numerous wastewater capacity studies and currently maintains the wastewater models for the Marina Coast Water District and the City of Mountain View. This team is well versed in developing customer inflows, calibrating wastewater models, and developing the design storm used to analyze the peak wet weather condition. Our engineers understand the issues with these aging systems and the complexities of upgrading them. Schaaf & Wheeler models several of these systems using a variety of modeling software including: EPA-SWMM, InfoSWMM, H2OMap, WaterCAD and ICM. Our team is skilled in making focused modeling runs to determine development impacts, system response to fire flow events, remaining capacities, and to size capital improvements. Our engineers provide on-call design services for these systems as well as construction support and special inspections. Our firm is structured such that we can work on a wide range of projects, from very specific model runs to large complex designs.

Wastewater On-Call Services - Below is a list of the specific model types that are typically used.

- ***Sewer Systems***– GIS based dynamic models (Infoworks, InfoSWMM, EPA SWMM5, SewerCAD), Spreadsheet based calculations
- ***Storm Drain Systems*** –GIS based 1-D and 2-D dynamic models (InfoSWMM, InfoWorks ICM, MIKE-URBAN, EPA SWMM5, StormCAD, XPStorm, FLO-2D), Spreadsheet based calculations
- ***Water Quality***– QUAL2E, SWMM, MIKE-URBAN Drainage Systems

Our engineers also provide on-call design services for these systems as well as construction support and special inspections.

Pump Station Assessments and Design - Schaaf & Wheeler has analyzed hundreds of pump stations for our clients throughout California. We have developed a creative and effective approach to these assessments that produce value engineered solutions. Our engineers work with electrical, corrosion, geotechnical and structural engineers to assure our clients a complete analysis of these pumping systems. In past 10 years Schaaf & Wheeler has provided design services for upgrade, replacement, and rehabilitation of more than 120 wastewater and stormwater pump station projects to the Bay Area local agencies.

Schaaf & Wheeler Experience in Design of Wastewater Pump Stations

Project and Client	Services Provided	Location	Capacity	Year	Pump Stations
Five Sanitary Sewer Pump Stations	Rehabilitation	City of San Mateo	Up to 1000 gpm	2017 - 2018	5
Pump Stations Facilities Repair, Delta Diablo	Improvements	Contra Costa County	Up to 20 MGD	2016-2017	5
Three Sanitary Sewer Pump Stations, City of Hillsborough	Improvements	Hillsborough	Up to 1000 gpm	2016 - 2017	3
Farmworker Housing Lift Station, MRWPCA	Design	Salinas	Up to 90 gpm	2016 - 2017	1
Basin 2/3 – Pump Station Alternatives, City of San Mateo	Rehabilitation	San Mateo	Up to 59 MGD	2016	3
Crestmoor (SW) and Lomita Pump Stations and Forcemain Replacement, City of San Bruno	Replacement	San Bruno	Up to 800 gpm	2016	2
Ord Village and Gigling Lift Stations and Forcemain, MCWD	Pump Replacement	Seaside	850 gpm	2016	2
Lift Stations D, F, W, J &K, City of Morgan Hill	Rehabilitation	Morgan Hill	170 gpm	2016	5

Project and Client	Services Provided	Location	Capacity	Year	Pump Stations
Wastewater Collection System in CSA 2A & 2B, County of Madera	Assessment and Design	Madera	Up to 1,500 gpm	2015-2016	11
42nd Avenue Pump Station, City of San Mateo	Design	San Mateo	300 gpm	2016	1
Pump Station Assessment, City of Half Moon Bay	Assessment, CIP and Design	Half Moon Bay	Up to 1,100 gpm	2016	3
Pump Station Improvements, City of Oakland	Assessment and Design	Oakland	Up to 3,900 gpm	2014-2016	6
East Bay Municipal Utility District's Pump Station Q Force Main Reverse Flow Project – East Bay Municipal Utility District	Rehabilitation	Berkeley	350 gpm	2015	1
Tanimura Employee Housing Lift Station, Whitson Engineers	Design	Monterey	120 gpm	2015	1
Sanitary Sewer Pump Station Assessment and Design, City of Fontana	Assessment, CIP, and Design	Fontana	Up to 1,200 gpm	2014	6
Sanitary Sewer Pump Station Assessment, Ross Valley Sanitary District	Evaluation Report	Ross Valley Sanitary District	Up to 38 MGD	2013	6
Sanitary Sewer Pump Station Evaluation, Town of Hillsborough	Assessment & CIP	Hillsborough	Up to 900 gpm	2013	3
Mariner's Island #5, City of San Mateo	Design	San Mateo	520 gpm	2011	1
Mariner's Island #6, City of San Mateo	Design	San Mateo	325 gpm	2011	1
Sanitary Sewer Pump Station Assessment, CIP, and Design, City of Alameda	Assessment, CIP, and Design	Alameda	100 to 1,200 gpm	2011-2016	32
Industrial Pump Station #8, City of South San Francisco	Design	S. San Francisco	2,000 gpm	2011	1

The table below presents our expertise in sewer replacement/rehabilitation, trunk alignment study and design, inspection, trenchless technology, CIPPs, siphon design and condition assessment, surveying and mapping, and constructability review to ensure workable designs with tightly controlled plans and specifications. The following table presents our wastewater pump station experience.

Schaaf & Wheeler Experience in Design of Wastewater Infrastructure

Project	Client	Services Provided								
		Detailed Assessment	Detailed Design	Project Prioritization	Trenchless Design	CIPP	Construction Plans	Engineering Estimates	Bid Support	Construction Support
Leong Drive Sanitary Sewer Design	City of Mountain View	●	●	●		●	●	●	●	●
Assessment & Design for Sanitary Sewer Main Rehabilitation	City of San Mateo	●	●	●			●	●	●	●
Force Main Appurtenance Projects	Ross Valley Sanitary District	●	●				●	●	●	●
Shoreline Sewage PS Assessment & Trunk Sewer Alignment Study	City of Mountain View	●		●				●		
El Camino Real Sanitary Sewer Improvement Project and the Calabazas Creek Sewer Siphon Design Projects	BRE Properties & City of Santa Clara	●	●		●	●	●	●	●	●

Project	Client	Services Provided								
		Detailed Assessment	Detailed Design	Project Prioritization	Trenchless Design	CIPP	Construction Plans	Engineering Estimates	Bid Support	Construction Support
Cabrillo Ave. Sewer Replacement Project	City of Santa Clara	●	●				●	●	●	●
Belmont Sewer Rehabilitation Projects	City of Belmont	●	●	●	●	●	●	●	●	●
Kingridge Sanitary Sewer Line Improvements	City of San Mateo	●	●	●	●	●	●	●	●	●
South Trunk Sanitary Sewer Relief	City of San Mateo	●	●	●	●	●	●	●	●	●
Morgan Hill Trunk Sewer #2	City of Morgan Hill	●	●	●			●	●	●	●

Potable Water Systems and Infrastructure Planning, Design and Construction Support

Pipe Design. Schaaf & Wheeler team engineers have provided innovative designs for new, replacement, and rehabilitated pipeline for multiple public agencies and private companies. Having worked on projects of equivalent magnitude for the Great Oaks Water Company, San Jose Water Company, Marina Coast Water District, Cal Water Service, American Water Company and Soquel Creek Water District, our engineers have the knowledge and experience required for the proposed projects and they understand the challenges involved in these projects. Schaaf & Wheeler has provided engineering services for more than 118,000 linear feet of water pipelines over the last 10 years ranging from 6 inches to 72 inches in diameter.

Schaaf & Wheeler Experience in Performing Potable Water Pipeline Design Services

Project Title	Pipe Size	Pipe Length	Year	Cost
South County Recycled Water Pipeline	30 inch	11,300 feet	2016	$20,000,000
Penitencia Delivery Mains	48 & 72 Inches	3,400 feet	2015	21,500,000
iStar	8 - 12 inches	5,300 feet	2015	$700,000
Santa Teresa Station	6 - 8 inches	2,000 feet	2015	$200,000
Communications Hill	4 - 8 inches	11,650 feet	2015	$2,100,000
San Vicente Road	6 - 12 inches	2,800 feet	2014	$160,000
South Village	6 - 12 inches	12,181 feet	2013	$780,000
Soquel Drive	6 – 16 inches	9,000 feet	2012	$3,300,000
Watkins Gate	24 inch	2,000 feet	2011	$550,000
Stone Gate	6 inch	3,500 feet	2008	$250,000
Hitachi Development	8 - 12 inches	18,000 feet	2006	$1,400,000
Tusccany Hills	6 - 12 inches	20,700 feet	2001-2008	$4,500,000
Reservation Road	18 - 20 inches	7,000 feet	2005-2006	$900,000
Montevina Pipeline	42 inch	10,000 feet	2005-2006	$2,400,000

Water Modeling. Schaaf & Wheeler has vast experience in water system master planning. We are currently working on similar modeling efforts in the City of Mountain View, the City of San Jose, and the Marina Coast Water District in Monterey County. As part of our work, engineers utilized computer models and GIS applications to compare meter data and demand projections, conduct field calibration services, and present findings to project stakeholders. Schaaf & Wheeler modelers embrace new data technologies including automatic meter reading (AMR) and advanced metering infrastructure (AMI). Our team has worked extensively with Water CAD and several other modeling software platforms. We have utilized H2OMap Surge to perform complex pressure transient studies for water systems throughout the Bay Area. Schaaf & Wheeler's master plan documents are designed to be actionable and assist cities with implementing Capital Improvement Programs (CIPs) and determining the nexus between new development and system impacts.

Water Pump Station Improvement Projects. Schaaf & Wheeler has worked on numerous water system booster pump station designs. Our services have ranged

from small electrical and communications upgrades to complex designs of new facilities. Recent projects with the City of Santa Clara, San Jose Water Company and the Soquel Creek Water District are examples of water pump stations utilizing our innovative approaches.

Schaaf & Wheeler Experience in Performing Potable Water Pump Station Services

Project	Location	Type	Capacity	Year
Cherry Creek Pump Station, City of Hillsborough	Hillsborough	Replacement	1,000 gpm	2017-2018
Aptos Pump Station, Soquel Creek Water District	Soquel	New	460 gpm	2015
McGregor Drive Pump Station, Soquel Creek Water District	Soquel	New	1.0 – 2.5 mgd	2015
27 Well Assessments, City of Santa Clara	Santa Clara	Assessment	800 – 2,200 gpm	2014
Camp Saratoga Water System Booster Station Design	Saratoga	New	200 gpm	2014
Vista Booster Pump Station	Hillsborough	Replace	600 gpm	2014
Skyfarm 3 Pump Station	Hillsborough	Evaluation	800 gpm	2013
Tournament Pump Station	Hillsborough	New/Upgrade	800 gpm	2013
Stonegate Water Supply Assessment & Well Alternative	San Benito	New	80 gpm	2013
Segunda Pump Station	Monterey	Replace	7,500gpm	2011
Watkins Gate Well & Pump Station	Marina	New	1,800 Well gpm	2011
Well 32/Well34 Improvement Projects	Marina	New	2,400 gpm	2011
San Jerardo Well Replacement - Storage, Booster Pump Station	Monterey	New	240 gpm	2010
Highlands of Los Gatos – Greenfield Pump Station	Los Gatos	New	385 gpm	2008
Valley Christian School Pump Station	San Jose	Rehabilitation	1,000 gpm	2008
Scotts Well 10 and Pump Station Rehabilitation	Scotts Valley	New	400 gpm	2007
Communications Hills Batista Pressure System	San Jose	New	5,500 gpm	2003
Communications Hills Azores Booster System	San Jose	New	1,600 gpm	2003

Recycled Water Infrastructure Planning and Design

Recycled Water Systems. Schaaf & Wheeler has designed new and retrofitted recycled water systems, and we understand the requirements for system separation and backflow prevention. Our experience includes transition mains, distribution systems and customer connections, mainly within the South Bay Water Recycling system. We are currently working on portions of the Pure Water Monterey project which will supply advanced treated recycled water for the District.

Schaaf & Wheeler Experience in Performing Recycled Water Engineering Services

Project Title	Client	Year	Contract Value
South County 30-inch Recycled Water Pipeline (11,300 feet)	Santa Clara Valley Water District	2016	$15,000
San Juan Oaks Water, Wastewater and Recycled Water System Project	Whitson Engineers	2015-2016	$224,140
Communications Hill Water System Improvement Plans	KB Home	2014-2015	$50,000
Pure Water Monterey Groundwater Replenishment Project, EIR	Monterey One Water & Monterey Peninsula Water Management District	2013-2015	$350,000
Groundwater Replenishment Project - Salinas River Inflow Impacts	Denise Duffy & Associates	2013-2015	$83,000
Groundwater Replenishment Project EIR Hydrology - Urban Runoff Capture at Lake El Estero	Denise Duffy & Associates	2013-2014	$36,500
Regional Urban Water Augmentation Program – Project Management	Marina Coast Water District	2007-2008	$25,000
Recycled Water Retrofits	City of Santa Clara	2000-2002	$95,192
South Bay Water Recycling Program	City of San Jose	1995-1999	$1,376,509
Reclaimed WaterEngineering Services	Marina Coast Water District	1993-2000	$125,136

What does Schaaf & Wheeler Team bring to the Marina Coast Water District?

Schaaf & Wheeler team brings a number of assets that the Marina Coast Water District can benefit from. These are as follows;

- We are a small local firm that is responsive towards clients and specializes in potable water, wastewater and recycled water systems design and engineering.
- We provide cost-effective, implementable solutions and designs that expedite the project completion with minimal change orders during the construction phase.
- Our firm has provided On-Call services to Marina Coast Water District for over two decades and is thoroughly familiar with the systems and the service areas.
- We bring a strong team under the leadership of a detailed-oriented, experienced, and skillful Project Manager – Andrew A. Sterbenz, PE who has more than 20 years of experience. He will provide expert engineering and strategic management services to keep the project in control and within schedule and budget.
- MCWD is one of Schaaf & Wheeler's longest-running clients for whom Andrew Sterbenz has designed wells, treatment systems, booster pump stations, water tanks, lift stations, a desalination plant, and water, sewer and recycled water mains all over Monterey County.
- Apart from MCWD, Andrew has also worked on multiple water resources projects in Monterey County for the Monterey County Water Resources Agency (MCWRA), Monterey Peninsula Water Management District (MPWMD), Monterey Regional Water Pollution Control Agency (MRWPCA), and California American Water Company. He understands the amount of coordination that is required among all these agencies for a project
- We have more than 30 years of experience providing engineering services for large infrastructure projects in busy urban corridors and understand the challenges involved and the methods to resolve them.

Schaaf & Wheeler - History of our Work with MCWD

Schaaf & Wheeler has served municipal clients continuously throughout our 31-year history. One of the longest-running clients is the Marina Coast Water District, for whom we have designed wells, treatment systems, booster pump stations, water tanks, lift stations, a desalination plant, and water, sewer and recycled water mains. Schaaf & Wheeler served as the MCWD District Engineer until 1998 when DE became a district staff position, provided a full-time Interim District Engineer in 2006-2007, and again part-time in 2012-2013 and 2015. Our staff members have made numerous presentations to the District's Board of Directors and at public meetings, as well as presented projects to numerous public agencies and regulatory authorities. In 2004, we designed the inter-ties that connected the Marina and Ord water systems. In 2006, Schaaf & Wheeler provided Engineering Review services to the District for the Water Master Plan being prepared by another consultant. The District recently completed construction of two projects designed by Schaaf & Wheeler engineers - Watkins Gate Well and Well 34.

Gigling and Ord Village Lift Stations, 2015-2016. Under on-call services to the Marina Coast Water District (MCWD). When the Gigling Lift Station and Ord Village Lift Station reached the end of their service life, the District asked Schaaf & Wheeler to help with the required upgrades. Schaaf & Wheeler analyzed the existing and projected wastewater flows, and selected replacement pumps for the stations which would work under both the current and projected future conditions.

MCWD 2015 Urban Water Management Plan Update. Schaaf & Wheeler prepared the 2010 and the 2015 UWMP update for the District. The 2010 update addressed the slow-down in growth within the Ord Community due to the economic downturn. The plan also addressed the requirements of Senate Bill X7-7 (2009), which requires urban water suppliers to achieve a 20% reduction in per capita water use by December 31, 2020. The 2015 planning effort documents water use reductions and progress made towards the 2020 water use reduction goal. The District has two water supply projects to meet the projected growth in demand: the Recycled Water Project and the new Regional Water Project. These projects have been adjusted to address the extended redevelopment schedule. Schaaf & Wheeler worked with the District staff, the Fort Ord Reuse Authority and the seven land use jurisdictions served by the District to update the required timeline for bringing these systems on-line.

MCWD On-Call Services (2012-Present). The Marina Coast Water District provides water and wastewater service to the City of Marina and the former Fort Ord in Monterey County. Schaaf & Wheeler provides engineering and planning support to the District. Services include:

System Modeling

Firm engineers maintain the District's distribution system model in Innovyze's H2Omap modeling software, which includes updating the physical infrastructure in the model, adding new developments and capital improvements, updating the model to reflect system booster pump control adjustments and verifying that the 2025 demand scenario is correctly distributed across the model nodes. The housing downturn of 2008-2012 drastically affected

the development schedule of the communities on the former Fort Ord, requiring occasional scenario runs to reevaluate the phasing of District capital improvements.

Model Calibration and Operations Modifications

Our engineers work with District operations personnel on a continuing basis to calibrate the hydraulic water model based upon SCADA trending data and field pressure measurements. The model calibration also assists District personnel to more efficiently operate the system and make adjustments to field settings, such as pressure reducing valves and pump controls, as new development impacts water demand patterns.

Fireflow Modeling and Field Testing

Schaaf & Wheeler assists the District's engineering staff during the design review process for new land development, to assess the water system's ability to serve new customers with both domestic demands and fire flow demands. Our engineers also perform field fire flow tests in coordination with the local fire department and the water District to verify the computer model results.

Interim District Engineer

Andrew A. Sterbenz, PE, of Schaaf & Wheeler, has served as the Interim District Engineer on several occasions in response to personnel changes within the District. As the manager for the on-call contract, Andy remains familiar with the District's standards and active projects, allowing him to fill this primary staff position while the District recruits to fill the vacancy. Duties performed as the Interim District Engineer include preparing the annual department budget, preparing the 5-year Capital Improvement Program update, reviewing and approving capital project plans, reviewing and approving development plans, preparing requests for proposal and advising the general manager in the areas of water supply development and infrastructure improvements.

Development Plan Review

Schaaf & Wheeler reviews subdivision plans for the District, which includes working with the developer's engineer to ensure the water and sewer system designs are consistent with the District master plans and identifying any needed changes to the District's CIP schedule. Schaaf & Wheeler also reviews developer's landscape plans for compliance with the District's water conservation ordinance and design standards.

Capital Improvement Design

Schaaf & Wheeler has designed numerous water and sewer capital projects for the District, most recently sizing the replacement pump for Well 30 and designing the Light Fighter Drive Water Main Extension. We recently designed the replacement of the Gigling force main.

Standards Updates

Schaaf & Wheeler has assisted District staff in updating the water and sewer system maps, updating standard construction details, drafting new standard specifications, and providing updates to the Engineering Procedures, Guidelines and Design Requirements document.

Relevant Project References

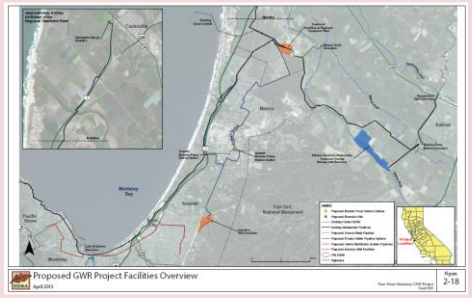
Pure Water Monterey Groundwater Replenishment Project EIR, 2013-2015

Project Owner and Contact:
Bob Holden, P.E.
Monterey Regional Water Pollution Control Agency
5 Harris Court, Building D
Monterey, California 93940
831-645-4634
BobH@mrwpca.com

Project Client:
Alison Imamura, AICP
Denise Duffy & Associates, Inc.
947 Cass St, Suite 5
Montery, CA 93940
(831)373-4341x12
aimamura@ddaplanning.com

Contract Value: $350,000

Project Staff:
Andrew A. Sterbenz, PE
Daniel J. Schaaf, PE
Josh C. Tabije



The Pure Water Monterey Groundwater Replenishment Project was jointly developed by the Monterey Peninsula Water Management District and the Monterey Regional Water Pollution Control Agency. The project consists of conveying wastewater, stormwater and agricultural tile drainage to the Regional Wastewater Treatment Plant to undergo primary, secondary and advanced treatment. The advanced-treated water would then be conveyed to the Seaside Groundwater Basin for injection and indirect potable reuse.

Schaaf & Wheeler prepared the stormwater availability studies for the proposed City of Salinas and City of Monterey stormwater capture components. We then worked with Todd Groundwater, the project's hydrogeologist, to assess the impacts of diverting wastewater from the City of Salinas Industrial Wastewater Treatment Facility for the project. Schaaf & Wheeler prepared a cumulative assessment of the various project diversions on flows in the lower Salinas River. Our modeling results were used by HDR, the project's fisheries biologist, in the evaluation of the effects on steelhead migration.

Schaaf & Wheeler assisted Denise Duffy & Associates (project's CEQA consultant) in preparation of the project's environmental impact report. Schaaf & Wheeler contributed to the Project Description, the assessment of construction schedules and activities for the air quality modeling, the surface water hydrology and quality assessment, and the assessment of project alternatives. Five of the appendices to the EIR were authored by Schaaf & Wheeler, including the Source Water Assumptions Memorandum and the supporting water availability studies.

Schaaf & Wheeler assisted with preparing responses to comments for the Final EIR. We prepared master responses in the areas of Source Water Availability, Impacts to Surface Water Flows, and potential impacts to a Planned Urban Recycled Water Project. In support of the Final EIR, Schaaf & Wheeler prepared additional studies assessing fish passage barriers in the Reclamation Ditch, and the potential project impacts on freshwater inflows to Elkhorn Slough.

Schaaf & Wheeler is providing on-going support during project implementation, assisting with regulatory agency permitting, right-of-way acquisition and facility siting and surveying for the injection well field.

Soquel Creek Water District Aptos and McGregor Pump Stations, 2012 – 2015

Client and Contact:
Mike Wilson, P.E.
Soquel Creek Water District
5180 Soquel Drive
Soquel, CA 95073
Ph: 831.475.8501x122
michaelw@soquelwater.org

Contract Value: $191,000

Construction Cost Estimate for Aptos PS: $700,000
Construction Cost Estimate for McGregor PS: $1,000,000

Project Staff:
Andrew A. Sterbenz, PE – S&W
Peder C. Jorgensen, PE – S&W
Glen M. Anderson, PE – S&W
Logan N. Fox, EIT – S&W
Anthony P. Notaro, PE – BCA

The Soquel Creek Water District (SqCWD) provides municipal water service in four service areas and seven primary pressure zones. The system is currently supplied solely with groundwater, with wells located in each of the four service areas. The District will be constructing new wells in Service Areas 1 & 2, and has planned system improvements to facilitate the movement of water between service areas. The District engaged Schaaf & Wheeler to design the two new booster pump stations – Aptos and McGregor.

Aptos Pump Station. Aptos Booster Pump Station is one of several planned improvements that will allow the District to move water east into Service Areas 3 & 4. This station will boost water from 242-ft pressure zone in service Area 2 into the 359-ft pressure zone in Service Area 3. The station has an initial design capacity of 460 gpm, but may be expanded in the future to 690 gpm. The District is modifying its well operations based upon new water quality rules and the effects of seawater intrusion into coastal aquifers. To meet these varied conditions, several pump types and configurations were analyzed. The preferred solution was a set of three vertical multistage pumps, with two operating and one in stand-by. To meet the future condition, the station is configured to accommodate a fourth pump which will allow three pumps to operate simultaneously. The pumps and electrical equipment are enclosed in a CMU building, designed by Biggs Cardosa Associates. Electrical design was by Fehr Engineering. Schaaf & Wheeler coordinated the design work with the Surveyor and Geotechnical Engineer, who were under separate contract with the District.

McGregor Drive Pump Station. The McGregor Drive Pump Station is one of several planned improvements that will allow the District to move water between Service Areas 1 and 2. Service Areas 1 and 2 operate at the same hydraulic gradient. Although the systems are inter-connected, little water transfers between them because of the significant physical separation. The pump station is needed to overcome the friction associated with the transfer of water over long pipe reaches. The station had to be configured to move flow in either direction between the two service areas. The initial station capacity required is 1.0 mgd, with a future peak capacity of 2.5 mgd peak. Due to other capital improvements planned within the system, the system hydraulics is expected to change over the service life of the initial pumps. A range of pump sizes were analyzed based on the various duty conditions and the range of target flows. Because the station is only pumping against friction loss in the pipelines, a single duty pump with a variable frequency drive is required (plus one standby pump). Based on the District's master planning timeline for when the station would need to exceed the initial capacity, it was decided that 25 hp pumps would be installed initially, but the station would be configured to accommodate 50 hp pumps in the future.

Both the project sites presented design challenges. Located in the Coastal Zone on a slope, the lower portion of the lot contains a wetland supplied by a groundwater seep. Constructing a building foundation uphill required addressing the saturated soils during construction and providing a permanent drain system to move the groundwater past the foundation and into the wetland. The final site design includes a gravity retaining wall to provide a level pump station site. The pumps and electrical equipment are enclosed in a CMU building, designed by Biggs Cardosa Associates. Schaaf & Wheeler coordinated the design work with the Surveyor and Geotechnical Engineer, who were under separate contract with the District.

Mountain View Hydraulic Modeling Services, 2014 - Ongoing

Client and Contact:
Lisa Au, PE
500 Castro Street
Mountain View, CA 94039-7540
Ph: 650.903.6140
Lisa.Au@mountainview.gov

Contract Value: $100,000

Construction Cost Estimate: Not Applicable

Project Staff:
Leif M. Coponen, PE
Daniel J. Schaaf, PE
Emily D. Straley, PE
Stephanie A. Tanverakul, PE

Schaaf & Wheeler provides the City of Mountain View potable water and sanitary sewer modeling and engineering services on an on-call basis, utilizing Innovyze's InfoWATER and InfoSWMM hydraulic modeling software for the analyses. As part of the firm's services to the City, our engineers performed water modeling analyses associated with the 2030 General Plan Update to determine needed infrastructure improvements, and to help update the City's Capital Improvement Program, in response to anticipated commercial and residential growth. Schaaf & Wheeler also provides assistance to the City's planning department as part of new development projects' environmental impact review process. Notable planning projects include North Bayshore Precise Plan, El Camino Hospital Campus, as well as various smaller commercial and residential developments.

On-Call Services for City of San Mateo (2003 – Present)

Client and Contact:
Jimmy Vo, PE
City of San Mateo
Department of Public Works
330 West 20th Avenue
San Mateo, CA 94403
650. 522.7319
jvo@cityofsanmateo.org

Contract Value: ~$800,000

Services Provided:

- Sanitary sewer main rehabilitation and replacement
- New sanitary sewer infrastructure design
- Sanitary sewer pump station assessment, analysis, and design
- Storm drain rehabilitation and replacement
- New Storm drain infrastructure
- Storm drain pump station assessment, analysis, and design
- Storm Drain Master Plan and ongoing modeling support
- FEMA analysis and CLOMR/LOMR
- Construction support services

Team Members:
Ben L. Shick, PE
Charles D. Anderson, PE
Glen M. Anderson, PE
Peder C. Jorgensen, PE
Emily D. Straley, PE
Logan N. Fox, PE

Sanitary Sewer Lift Stations Rehabilitation Services - Five Pump Stations, 2017 - 2018.

Contract Value: $314,121

As part of the Cease and Desist Order (CDO) issued by the Regional Water Quality Control Board (RWQCB), the City of San Mateo's Clean Water Program is working to assess and upgrade aging sewage infrastructure. The 5 pump stations under consideration are: Kelly/Kehoe, Laurie Meadows, Los Prados No. 1, Los Prados No. 2, and Los Prados No. 3. These pump stations need rehabilitation as part of the City's Biennial Pump Station Upgrade Program. Schaaf & Wheeler identified the need of significant improvements to each pump station including expanded wetwells, increased station capacity, and variety of additional improvements.

Three Sanitary Sewer Pump Stations Under City's Clean Water Program in Basin 2/3, 2016 - 2017.

Contract Value: $24,240

Basin 2/3 Collection System Improvements work includes alternatives evaluation, preliminary design, and detailed design of the 41st Ave., 38th Ave. and Dale Ave. pump stations.

Sanitary Sewer Rehabilitation Projects, 2015 – Present.

Contract Value: $191,000; Construction Cost: $885,000

The project includes 6", 8", and 12" of 4,000+ LF of sanitary sewer rehabilitation. Schaaf & Wheeler completed site investigations, inspections, researched existing data, and developed recommended alternatives for various sewer rehabilitation projects within the City of San Mateo. As directed by the City, Schaaf & Wheeler proceeded with detailed design of the recommended alternatives which consisted of:

- Sewer line rehabilitation with cured-in-place pipe (CIPP)
- Sewer main replacement
- Sewer main realignment
- Replacement of sewer lines across drainage channels (both above ground on piers, and below ground)
- Replacement of sewer lines through large drainage box culverts
- Manhole rehabilitation and replacement

The work included geotechnical investigations, easement research, topographical surveying, and environmental permitting. S&W also assisted with environmental permitting and Caltrans E.P.

City of San Mateo 42nd Avenue Sanitary Sewer Pump Station, 2015

Contract Value: ~$242,472; Construction Cost: $983,000 (estimated)

Schaaf & Wheeler was selected to provide engineering services for the condition assessment and design to rehabilitate the 42nd Avenue Pump Station and force main. The station's mechanical and electrical equipment is beyond its useful life, and shows deterioration. Additionally, many portions of the existing station do not comply with modern codes and safety standards. As such, the City selected Schaaf & Wheeler to evaluate and design the rehabilitation of the pump station. The project includes replacement of all electrical and mechanical equipment, addition of a backup generator, and requires detailed utility investigation and a Caltrans encroachment permit.

Kingridge Sanitary Sewer Line Rehabilitation and Replacement, 2014

Contract Value: $927,673; Construction Cost: $2,594,986 (All 3 Phases)

The improvement project rehabilitated and replaced the 6-inch sanitary sewer main located within a 10-foot utility easement in a steeply-sloped and wooded canyon behind homes on Kingridge Drive. The City has experienced very high maintenance issues with the sewer pipe and due to several operational issues, the RWQCB issued a Cease and Desist Order requiring immediate action.

Similar Scope and Complexity - Schaaf & Wheeler provided consulting services to the City of San Mateo including:

- Investigation of existing conditions
- Hydraulic analysis of the existing Kingridge Canyon sewer system
- Development of improvement alternatives for the sewer main
- Development and production of construction documents for the selected alternative

The selected improvement alternative included slope stabilization, access improvements, pipe replacement, pipe rehabilitation with cured-in-place pipe (CIPP), pipe placed on structural supports, and various drainage improvements. Limited site access required the use of specialty construction methods and materials.

The project also included close coordination with subconsultants for environmental permitting and mitigation, geotechnical/geological investigation, surveying, and structural design. Access to the sewer line required entry through private property during design and construction. Schaaf & Wheeler worked with the City to develop and implement a project outreach program for the design and construction phases of the project. The public outreach aimed to engage residents throughout the project duration, providing transparency and a collaborative atmosphere.

South Trunk Sanitary Sewer Relief Line, 2009-2012

Contract Value: $995,000; Construction Cost: $20 million

The City of San Mateo sewer system required additional capacity for peak wet weather flows. S&W was hired to design the 8,000 LF relief line – called the South Trunk Sanitary Sewer Relief Line – along an alignment running from the San Mateo County Expo Center to the Dale Avenue Sanitary Sewer Pump Station. The 42-inch to 54-inch pipeline was designed to relieve existing gravity sewer mains at six junction structures. S&W used the City's hydraulic computer model data to design the hydraulics of the junction structures in order to maximize existing pipe capacity while alleviating SSO's in problem areas. The project demanded multiple pipeline construction and rehabilitation techniques including cured-in-place pipe, open-trench, and micro-tunneling with varying ground conditions including Bay Mud and liquefiable soils with high groundwater.

The Schaaf & Wheeler team incorporated the expertise of seven staff engineers and eight subconsultants for surveying, structural engineering and CEQA documents. Environmental clearance was obtained through CEQA process due to the project being funded with a State Revolving Fund Loan.

Construction of the pipeline required permits from California Department of Transportation (Caltrans) for the highway crossings and California Department of Fish and Game for crossing the drainage channels.

Rehabilitation/Replacement of Mariner's Island Sanitary Sewer Pump Stations #5, #6 and #2

Contract Value: #5 - $85,337; #6 - $52,420; #2 – $114,000; Construction Cost: $2,335,000

The City of San Mateo owns and maintains a number of sanitary sewer pump stations that have been in service for more than 20 years. Schaaf & Wheeler evaluated all of the City's Sanitary Sewer pump stations for reliability and has designed the rehabilitation of 3 of the station.

The **Mariners' Island #5 and #6** station rehabilitations abandon the existing Smith & Loveless wet-pit/dry-pit configuration in favor of rail-mounted, non-clog submersible pumps placed in a new precast wetwell placed adjacent to the existing station, eliminating the need for confined space entry into the station in order to service the pumps. The new design of Mariners' Island #5 and #6 pump station includes all necessary equipment to meet the reliability requirements set forth by the US Environmental Protection Agency (EPA) and the Regional Water Quality Control Board (RWQCB), including an emergency generator, bypass pumping connection, redundant control system, redundant pumping capacity, and the necessary alarms.

Mariner's Island Pump Station #2 receives pumped sewage flow from several upstream pump stations and direct gravity influent from a local 105-acre tributary area. The contributing sewersheds were modeled to determine anticipated peak wet weather flows as part of the pump station preliminary design; along with forcemain hydraulics between the station and treatment plant headworks. The Schaaf & Wheeler team prepared a creative design in order to take full advantage of existing structures, while upgrading mechanical and electrical systems. The design project included geotechnical and structural assessments, rehabilitation of the wetwell and grit chamber to address hydrogen sulfide corrosion, and replacement of an odor control bio-filter as part of a new forced-air ventilation system. Engineers converted the existing wetwell-drywell multi-level underground structure into a dedicated wetwell with rail-mounted submersible pumps and a mid-level valve and piping vault. New weather-proof freestanding electrical panels and back-up engine generator with critical-grade sound attenuating enclosure were located on-site. The design focused on greater operational flexibility with emphasis on reduced complexity and ease of maintenance. Project challenges included poor soil conditions that required net-neutral soil loading constraints, odor and noise sensitive receptors in close proximity, site space constraints, and maintenance of existing sewer flows during construction.

Foster City On-Call Review and Inspection Services, 2014 - Ongoing

Client and Contact:
Allan Shu, PE
Associate Civil Engineer
Foster City/
Estero Municipal Improvement District
610 Foster City Boulevard
Foster City, CA 94404
Phone: 650-286-3270
ashu@fostercity.org

Contract Value: $100,000

Construction Cost: Not Applicable

Project Staff:
Robin J. Lee, PE
Caitlin J. Gilmore, PE, QSD, QSP

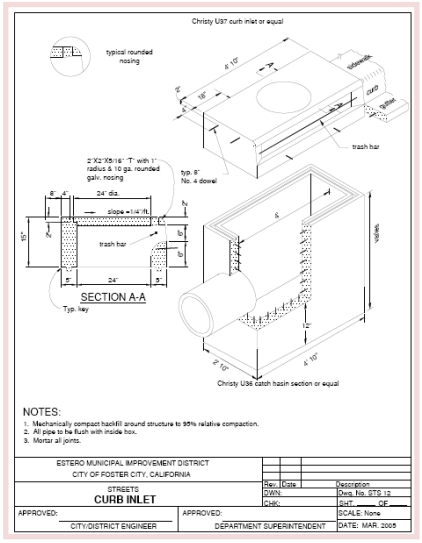
Foster City Drainage Standards

Foster City does not have any published drainage standards to assist developers with storm drainage design. With the increasing C3 and C6 requirement in the Municipal Regional Stormwater Permit (MRP) for the Bay Area, the City hired Schaaf & Wheeler to develop the City's storm drainage standards to include specific details on C3 and C6 stormwater requirements as well as design criteria and submittal package requirements.

The goal of this project was to create a clear and concise guideline for developers to design storm drainage infrastructure and prepare consistent permit submittal packages.

In addition, Schaaf & Wheeler updated standard detail drawings and created new standard details that were missing.

The City has also hired Schaaf & Wheeler on an on-call basis to assist with the review of drainage submittals and answer questions in regards to C3 requirements to ensure the City is in compliance with the MRP.
Contract Value: $21,400



Water and Sanitary Sewer Design Standards/Criteria Update (2014 – 2015)

Schaaf & Wheeler developed standards based on the City's current ordinance and standard details. Materials and guidance from the County and surrounding Cities such as Redwood City were used to ensure consistency.

Schaaf & Wheeler reviewed the City's existing online Standard Details for compliance with standards such as Redwood City standards and other local jurisdictions. Up to 10 standard details were revised and 5 new standard details were formulated. Draft and Final Water System Design Standards were submitted.

For sanitary sewer standards - 10 of the City's standard were revised, a curb ramp detail and other 5 new details were formulated. The City is now using the standards on the upcoming construction projects.
Contract Value: $20,000

Plan Development Check On-Call

This project started out with mostly checking stormwater and also looking at plans for City specs and details for utilities in the ROW. Schaaf & Wheeler extended services to checking all utilities and basically performing the role of the City engineers. There are currently 3 development projects detailed below. Some were set up for individual submittals, and others were lumped together. These were set up under the direction of the City staff. Our engineers also provided construction support in the form of reviewing RFIs and submittals.

BioMed Realty Demo and Specs - S&W provided review services for the Demolition Plans, Rough Grading, and Fine Grading for the BioMed Realty development project at 200 Lincoln Drive. Review of the Demolition Plans & SWPPP, included:

- Water Design and Standards
- Sanitary Sewer Design and Standards
- Storm drainage system Design and Standards
- FEMA Flooding
- C.3 Post Construction stormwater controls
- C.6 & SWPPP Construction erosion and pollutant controls

Contract Value: $20,000

Our engineers also conducted the BioMed Realty Underground Utility Plan Check. Contract Value: $7330

Biomed/Illumina Development: Sanitary Sewer Capacity Study Review - Schaaf & Wheeler provided review services for the Sewer Capacity Study for the Biomed/Illumina development project on Lincoln Drive. Our scope of services included the Sanitary Sewer Capacity Study Review including Sanitary sewer design and standards; Hydraulic analysis; average dry weather flow calculations; peak wet weather flow calculations; model output results as reported in memo; on-site sewer capacity impacts; conditions of Approval (provided by the City). Contract Value: $2072

Gilead Science Building, Rough Grading, SWPPP - Schaaf & Wheeler provided review services for the Rough Grading Plans for the Gilead Sciences Building 357 development project on Lakeside Drive. Review of the Rough Grading Plans and SWPPP, including:

- Water Design and Standards
- Sanitary Sewer Design and Standards
- Storm drainage system Design and Standards
- FEMA Flooding
- C.3 Post Construction stormwater controls
- C.6 & SWPPP Construction erosion and pollutant controls
- Conditions of Approval (provided by the City)
- Public ROW hardscape standards

Contract Value: $3,882

Gilead NB 357 UU Plan Review – Schaaf & Wheeler conducted drainage, underground utility and landscape plans development review. Our scope of services included *Plan Review* - Review of the Grading and Drainage, Underground Utility and Landscape Plans, and Storm Water Management Plan, including:

- Water Design and Standards
- Sanitary Sewer Design and Standards
- Storm drainage system Design and Standards
- Water Study
- Hydrology Study
- Sewer Study
- Bond Estimate
- FEMA Flooding
- C.3 Post Construction stormwater controls
- C.6 & SWPPP Construction erosion and pollutant controls
- Conditions of Approval (provided by the City)
- Public ROW hardscape standards

Contract Value: $6,845

Lincoln Campus Centre Campus Construction Review Support - Schaaf & Wheeler provided construction review support services for the Lincoln Centre Campus development project at 200 Lincoln Centre Drive. The scope of services included:

- Design RFI submittal review;
- Submittal review Coordination with contractor, design engineer, and City
- Meetings/Site Visits/Coordination

Contract Value: $54,576

Upper Llagas Creek Flood Protection Project, 2010 - 2014

Project Owner & Contact:
Stephen Ferranti
Project Manager
Santa Clara Valley Water District
5700 Almaden Expressway
San Jose, CA
Ph: 408.630.2616
sferranti@valleywater.org

Client & Contact:
RMC Water & Environment
Glenn Hermanson – Project Manager
North First Street, Ste. 212
San Jose, CA
Ph: (408) 240.8160

Contract Value: $682,000

Construction Cost: $120 million

Project Staff:
Charles D. Anderson, PE
Larry D. Johnson, PE
Stephanie A. Tanverakul, PE
Lenny Klakulak

The Upper Llagas Creek Flood Protection Project is located in Morgan Hill, San Martin, Gilroy and unincorporated areas of southern Santa Clara County, California. The Project represents roughly half of the original Natural Resources Conservation Service (NRCS) Llagas Creek Flood Control Project. The NRCS completed the lower reaches of the project from Buena Vista Avenue to the Pajaro River in the 1970s. Santa Clara Valley Water District is the local project sponsor and asked the U.S. Army Corps of Engineers to take control of project completion from the NRCS. Upper Project reaches include new bypass facilities through downtown Morgan Hill, a diversion channel from West Little Llagas Creek to Llagas Creek near Lake Silveira at Monterey Highway, and channel restoration downstream from Monterey Highway through San Martin to Buena Vista Avenue in Gilroy. East Little Llagas Creek will be improved from the Corralitos Creek/Madrone Channel confluence to Llagas Creek.

Schaaf & Wheeler has completed analyses and hydraulic modeling for the entire system. Our team completed the Corps' risk and uncertainty analysis within urban reaches. Bridge scour and erosion and maintenance requirements for revegetation were evaluated based on hydraulic impacts. An induced flooding analysis for rural reaches was also completed. Ccontract documents for the channel diversion between West Little Llagas Creek and Llagas Creek near Lake Silveira and for habitat restoration in the vicinity of Lake Silveira were prepared. Schaaf & Wheeler has also designed a variety of drop structures and fish passage facilities.

Anderson Dam Seismic Retrofit Project Management Services, 2012 - Ongoing

Project Owner and Contact:
Emmanuel Aryee
Engineering Unit Manager
Santa Clara Valley Water District
Ph: 408-630-3074
earyee@valleywater.org

Contract Value: $750,000

Address:
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Project Staff:
Charles D. Anderson, PE
Andrew A. Sterbenz, PE
Justin R. Maynard, PE
Peder C. Jorgensen, PE
James R. Schaaf, Ph. D, PE
Alex Oran

Schaaf & Wheeler is a subconsultant to the firm Black & Veatch (B&V) providing Program Management services to the District for the Anderson Dan Seismic Retrofit Project (ADSRP), as well as the Calero and Guadalupe Dam Seismic Retrofit projects. Schaaf & Wheeler provides 50% of the total Black & Veatch contract project services for this project. The Planning Phase of the program included geotechnical investigations, environmental impact analyses, hydrologic and hydraulic analyses (riverine and reservoir routing and operations analysis, including computational fluid dynamic modeling), geotechnical analyses, and project alternatives development, assessment, and selection. Schaaf & Wheeler services during this phase of work include technical quality assessment and quality control, management of phase consultants scope, budget and schedules, cost management tools and tracking, document control and management, coordination of environmental review and permitting, and administrative services. Project activities included outreach and coordination with a technical review board, as well as regulatory agencies FERC and California DSOD, including understanding and implementing both the technical and documentation requirements of these agencies. Preparation of an internal QA/QC plan, as well as contributing significantly to the B&VC project QA/QC plan was also within the scope of our services.

Most recently, the Board of Consultants, FERC, and DSOD had concerns about the planned interim dam height of 570 feet not being enough. Schaaf & Wheeler assisted the decision-making by conducting the following analyses:

- SCVWD is installing the lake tap pipe that will act as a “Construction Diversion” outlet structure, with a high outflow capacity to keep the level down during construction, detailed hydraulics were calculated for the Diversion Outlet (also known as the Low Level Outlet Works tunnel, or LLOW)
- A unit hydrograph runoff model and hydraulic channel and reservoir routing model was developed and calibrated in Matlab
- Markov Chain Monte Carlo was used to generate 12,000 realistic hourly annual rainfall timeseries - These were based on monthly statistical distributions of dry and wet period durations (in hours) and statistical distributions of rainfall depth. Distributions were sampled to build a timeseries from alternating wet and dry periods. Markov Chains was used to develop patterns to distribute the precipitation for each event. This is based on data from one gage near the centroid of the watershed
- The 12,000 hourly simulations were routed using the Matlab model to establish a reliability and an outflow frequency

The District used these detailed analyses to establish the target of elevation of 570 ft NAVD as safe for the crest, and to balance risk (both the risk of overtopping the reservoir and the risk associated with releases). This is also used to develop operating rules during construction (i.e. if the reservoir is at X elevation, open the valve Y amount).

Schaaf & Wheeler also provided risk management support during for the ADSRP planning phase. Alternatives analyses were conducted for interim safety measures at Guadalupe Dam, and analysis of gauged data and construction season inflows for Anderson Dam. We also supported the development of a risk management database for the project, which includes identification of project risks, their potential to occur, impacts to cost and schedule, and the development and implementation of risk mitigation strategies.

Schaaf & Wheeler was directly responsible for planning and facilitating a wide variety of project meetings, including public outreach, internal client coordination meetings, technical board of consultant meetings to present and review key project findings, regular progress meetings with phase consultants, and with various regulatory agencies, both in dam safety and environmental fields. Coordinating with the District, we direct the technical content of these meetings; and provide the administrative support, meeting agendas, presentations and records.

Leong Drive Water and Sanitary Sewer Main Replacement Design, 2016 - 2019

Client and Contact:
City of Mountain View
Arlynn A. Bumanglag, PE
500 Castro Street
Mountain View, CA 94039-7540
Ph: 650.903.6002
Arlynn.Bumanglag@mountainview.gov

Contract Value: $608,353

Construction Cost: $5 Million

Project Staff:
Leif M. Coponen, PE
Glen M. Anderson, PE
Stephanie A. Tanverakul, PE

The project proposes the replacement of approximately 1,300 linear feet of water main, approximately 1,400 linear feet of sewer main, all lateral connections and other related water and sewer appurtenances in Leong Drive. The proposed sewer replacement project will reverse existing direction of flow and redirect flow towards a sewer trunk with available hydraulic capacity. The water and sewer main replacements will address existing capacity deficiencies and deteriorating pipe conditions.

Schaaf & Wheeler prepared an alternatives analysis report documenting the preliminary design considerations for the sewer and water main replacements. Replacement water and sewer pipes will be installed via open-trench or trenchless construction methods. Hydraulic capacity was evaluated with the City's existing computer models for both an existing and future build-out condition. Within this report, the feasibility of the water and sewer main alignments are evaluated along with a discussion on construction methods and phasing. Impacts to nearby buildings and businesses are also considered.

Currently the Schaaf & Wheeler engineers are providing services for the design phase to the City of Mountain View. Our engineers are working with multidisciplinary subconsultants to coordinate several related studies for trenchless technologies and engineering, structural engineering, geotechnical and environmental engineering, CEQA documentation, surveying and basemapping, corrosion engineering, potholing services for utility investigations and, arborist services.

The largest constraint for the new alignment connecting Leong Drive to the East Trunk is the existing 81-inch diameter storm drain crossing at Evandale Ave. Crossing this storm drain requires a deep sewer under-crossing with an approximate 20 foot depth.

Level of Services

Local Familiarity

Schaaf & Wheeler is a local firm, operating an office in Monterey County for over 15 years. We have worked with MCWD for over 25 years, as well as other local agencies including Monterey One Water, Monterey County Water Resources Agency, and Monterey County Public Works. Although our local staff is small, the full resources of the firm are available to support the District, particularly in the areas of modeling and capital project design.

Having worked with the District for so long, we understand the need to redevelop the former Fort Ord and the difficulties with having seven land use jurisdictions within the District's service area. The patchwork of general plans and development goals works against an orderly updating of the aging infrastructure on the base. The Fort Ord Reuse Authority may sunset in 2020, and if it does, it is unclear how the remaining reuse plan mitigations would be completed by the Cities and County.

Regional Challenges

One of the largest challenges for the region is water supply. The Salinas Valley Groundwater Basin is in overdraft despite earlier projects intended to address the over-pumping that led to seawater intrusion along the coast. Recent studies have shown that the earlier projects have led to some recovery of fresh water in aquifers along the coast, but the problem is not yet solved. MCWD has become the Groundwater Sustainability Agency (GSA) for portions of the Salinas Valley Groundwater Basin, but must still coordinate with the county-wide GSA for management of the resource.

Another challenge specific to the Ord Community is the lack of water supply to support development, coupled with reduced water demand due to conservation. Several jurisdictions cannot entitle additional projects because they have committed their allocated groundwater to specific plans and projects which are not progressing. The District has committed to develop additional water supply for the Ord Community, but it is difficult to commit funds for new water supplies while your existing supplies are not being utilized. Ideally, some reallocation of unused water supply between jurisdictions would occur before the Fort Ord Reuse Authority sunsets.

Scope of Services

Schaaf & Wheeler's general approach for water and wastewater infrastructure design projects is described in the following section. A project specific approach will be developed to match the project requirements, complexity, and the desires of the City. Schaaf & Wheeler will work with the City to develop a detailed scope of services appropriate for each specific project.

We have included subconsultants for structural engineering, electrical engineering, surveying/mapping, geotechnical engineering, hydrogeology, environmental permitting, CEQA and grant writing for added services to provide a full services team as and when deemed necessary.

Project Management

Schaaf & Wheeler's project manager, Andrew A. Sterbenz, PE will maintain frequent communication with City staff throughout the project so that course corrections can be identified and implemented quickly. Schaaf & Wheeler will be available for project kick-off meetings, design review meetings, and other meetings as necessary to effectively execute the project.

Schaaf & Wheeler will maintain a Microsoft Project schedule throughout the duration of the project that shows progress against the baseline. Maintaining an up-to-date schedule ensures that all parties involved in the project are aware of the critical path activities and the associated timeline for each task. Project costs will be managed in several project areas with proper planning and design. The following tasks may result in project savings:

- Evaluation and selection of construction materials and methods is an important process for all infrastructure projects. Appropriate selection can result in significant project savings. The most economical and feasible solution depends on several site specific variables, and may include a variety of construction methods.
- Project alternative analysis to determine the most practical and economical project approach.
- Accurately locating and identifying existing utilities is an important task for all infrastructure projects so that unexpected conflicts during construction can be minimized.
- Constructability reviews will be performed to minimize issues during construction.
- The use of performance based specifications will be considered, which allow the Contractors/Bidders freedom to creatively reduce cost while maintaining control of quality for the City.

- Often times bid alternates allowing a range of materials or approaches can result in project savings; this will be considered during design.
- Revocable bid items may be considered to ensure that the final project matches the City's available funding.

Quality Control. Schaaf & Wheeler will implement various quality control procedures for each project. The level of effort will be appropriate to the level of project development. The quality control procedures may include: constructability reviews by Schaaf & Wheeler's construction management staff, independent peer reviews by those staff qualified in the specific area of review but who are not directly associated with the development of project documents, and project management reviews. Key components of the plan review will include: checking for fatal flaws and/or construction and staging issues, system maintenance concerns, and verification that the plans and specifications are in concurrence with the City's standards and policies.

Preliminary Design. Key components of the preliminary design for water or wastewater infrastructure projects are discussed in the following subtasks.

Data Gathering and Condition Assessment

Schaaf & Wheeler will request existing pertinent information from the City at the beginning of each project. Our team engineers will conduct additional surveys, investigations, and inspections as necessary fir the cost-effective completion of each specific project.

Project Definition

Schaaf & Wheeler will perform a preliminary engineering and economic analysis of the proposed improvements. This task will take place concurrent with the utility research as the existing utility locations may ultimately decide the location of improvements. Schaaf & Wheeler will recommend a project scope that best matches the available funding. Schaaf & Wheeler will analyze potential issues and will provide alternatives and recommendations. A summary of all considered alternatives will be included in a Basis of Design Memorandum submitted to the City for review and comment.

Utility Research

It is necessary to identify all potentially conflicting utilities throughout the project limits in the early phases of design. Schaaf & Wheeler's primary goal will be to avoid interference with existing infrastructure; however, where conflicts cannot be avoided, team engineers will identify the need for their relocation. Schaaf & Wheeler will identify and locate utilities using the USA locator service and the expertise of a professional underground utility locator, potholing critical utilities as required. Team engineers will also contact each utility company in order to coordinate the proposed project and to obtain any as-built plans that exist within the project limits.

Hydrologic and Hydraulic Analyses

Schaaf & Wheeler will perform the necessary hydrologic and hydraulic calculations and/or modeling to accurately size pipes, pumps, and other project components as necessary. Schaaf & Wheeler may utilize any existing hydrologic models to refine designs and analyze alternatives. Schaaf & Wheeler will use the City's design standards when appropriate, and will recommend methods, materials and hydraulic structures when the City's standards are not applicable. Below is a list of the model types that are typically used for each type of infrastructure.

- ***Sewer Systems*** – GIS based dynamic models (Infoworks, InfoSWMM, EPA SWMM5, SewerCAD), Spreadsheet based calculations
- ***Storm Drain Systems*** –GIS based 1-D and 2-D dynamic models (InfoSWMM, InfoWorks ICM, MIKE-URBAN, EPA SWMM5, StormCAD, XPStorm, FLO-2D), Spreadsheet based calculations
- ***Creeks, Rivers, and Storage Areas*** – HEC 2, HEC-GeoRAS, FLO-2D, MIKE-21, GIS based dynamic models
- ***Hydrology*** – HEC 1, HEC-GeoHMS, HFPH, GIS based dynamic models
- ***Water Quality*** – QUAL2E, SWMM, MIKE-URBAN Drainage Systems

Design Plans and Specifications

Schaaf & Wheeler typically prepares construction documents with submittals of plans and specifications at the 65%, 95% and final stages of design. These submittals are intended for review and comment by the City. After each submittal Schaaf & Wheeler will meet with the City to review and discuss the submittal. Our team will integrate comments, changes and requests by the City in the subsequent submittals. Plans will be produced in AutoCAD and

will be submitted to the City in both electronic and hard-copy format. Depending on the City's preference, technical specifications can be provided as a camera-ready document or in a variety of electronic formats.

Bidding and Construction Administration

Schaaf & Wheeler is prepared to provide consultation to the City during the construction phase of the project. Construction support may include attendance at the pre-construction meetings, reviewing and responding to requests for information (RFIs), assisting with questions regarding interpretation of drawings, specifications, and reports, shop drawings and product submittal review, attendance at meetings and site visits as requested by the City, and processing construction change orders as required. At the City's request, Schaaf & Wheeler will involve the firm's construction management personnel for assistance and guidance. Our team can provide construction management, inspection, observation, and materials testing during construction can also be provided upon request.

Record Drawings and Project Close-Out

Schaaf & Wheeler plans to assist the City with closing out the Construction Contract. Once the project is complete, our engineers will provide the City with record drawings showing the as-built conditions. The record drawings will be produced from marked up plans maintained by the contractor in conformance with project specifications.

Additional Tasks - Potential additional tasks Schaaf & Wheeler specializes in are listed below:

Construction Observation – Schaaf & Wheeler's team can provide observation during critical construction processes as deemed necessary and as requested by the City.

Operation and Maintenance (O&M) assessment – Schaaf & Wheeler is well versed in O&M reviews and have helped our clients review existing standards, equipment, practices, and reporting mechanisms and make recommendations for improvement. We can perform these reviews and assessments from a general master planning level to assisting in implementation.

Review and Modify Standards – Review current design standards and specifications and recommend changes that are tailored to the City's infrastructure and goals. Additional standards and specifications can be developed or modified to meet changing regulatory requirements. Schaaf & Wheeler has developed design criteria for detention and retention, Green Streets, sewer and storm drain infrastructure, and pump stations.

Water Quality and NPDES Support – Schaaf & Wheeler has extensive experience in supporting clients with stormwater quality issues including NPDES permit requirement implementation in the Bay Area. Our team engineers have designed numerous erosion plans using both standard and site-specific best management practices. We have helped our clients develop short- and long-term plans for meeting regulatory requirements including financial analyses. We have developed numerous Stormwater Management Plans (SWMPs) and other documents for regional water quality control boards (RWQCBs) and other agencies.

Trash Capture Planning and Design – Trash Capture – Schaaf & Wheeler has completed trash capture feasibility plans to assist the Cities in complying with the Regional Water Quality Control Board (RWQCB) NPDES Municipal Permit section C.10. Our engineers analyze the City's existing storm drainage system and trash capture efforts to determine the most feasible alternatives for meeting the trash reduction goal. Our engineering solutions include methodologies, strategies and schedule for implementation, description of proposed control measures and proposed best management practices (BMPs).

BMP & LID **–** Our team will review existing BMP and LID standards and make recommendations to meet current regulatory requirements and to meet the needs of the City. Schaaf & Wheeler has designed, reviewed and monitored many of these technologies and will use that knowledge base to help the City navigate through these regulations.

Approach towards Partnering with the District

Schaaf & Wheeler will work closely with District staff throughout the design process to ensure the needs and goals of the projects are met. Schaaf & Wheeler will provide the District with a project update on a monthly basis that will include a current design schedule, description of work performed the previous month, breakdown of costs, issues encountered, and will identify critical activities for the upcoming months.

In order to keep costs within budget, Schaaf & Wheeler will prepare monthly summary sheets detailing the amount of work completed, budget expended, budget remaining, a revised schedule and action items for the District as well as Schaaf & Wheeler Team on a task by task basis.

Our Project Manager, Andrew A. Sterbenz, PE will serve as Schaaf & Wheeler's point of contact and will be responsible for communications with the District's management team. We are familiar with the District's procedures and recognize the critical role District staff plays in administering each of the individual contracts while ensuring that all of the projects done are consistent with the District's standards and guidelines, are on schedule and budget, and meet the goals of the District. Our team will work with the agency to ensure delivery of necessary improvements, required coordination and communication between the District, the Consultant, and other interested parties.

Current Workload and Adherence to Schedule

Schaaf & Wheeler has extensive experience with On-call consulting services and we are capable of quickly adapting to unknown project assignments. Schaaf & Wheeler holds weekly workload meetings with all project managers where staff time can be adjusted as necessary to meet new projects and deadlines. Schaaf & Wheeler coordinates with the proposed subconsultants on a daily basis are we are capable of quickly scheduling the associated work. As demonstrated by the organization chart, Schaaf & Wheeler has assembled a team of well-qualified, experienced project leads and project engineers to ensure the project's needs and objectives are met in a timely manner, consistent with the project schedule as set forth for each awarded project. In addition to the staff identified here, Schaaf & Wheeler has a team of additional engineers available to work on projects, if necessary to stay on schedule.

Maintaining Quality Control

Schaaf & Wheeler prides itself in providing high quality products at each of the submittal stages. Having recently completed multiple rehabilitation design projects, Schaaf & Wheeler has a robust quality assurance and quality control procedure in place. Our team will follow this quality control procedure and checklist from the beginning of the project. Review types, signoff requirements, and both in-house and City review personnel will be identified for each subtask of the project. The quality control procedure will include; constructability reviews, independent peer reviews by staff qualified in the specific area of review not directly associated with the development of project documents, and project management reviews. The calculations, plans, specifications and estimates will have a review and signoff procedure. Key components of the plan review will include: checking for fatal flaws and/or construction and staging issues, system maintenance concerns, and verification that the plans and specifications are in concurrence with the City's standards and policies. Quality control reviews will be appropriate to the level of project development.

Methods and Techniques for Delivery Quality Services

Deriving effective management techniques from our prior project experience, we will be able to deliver services within cost, schedule, and resources. We will ensure projects are completed on time and on budget while giving constructible alternatives and designs to the District. The Project Manager will define and manage the scope of each project, build a work breakdown structure, create a project plan, create the project budget, define and allocate resources, manage the project development, identify and manage risks, and understand the project procurement process. These will be achieved by following three key factors.

i) Communication – Effective management begins with communication which needs to occur in many areas including:

- Between design team and the District Project Manager. This can be accomplished through regular scheduled meetings such as monthly meetings, progress meetings at critical design phases such as preliminary design workshops and submittal review, and written progress reports with invoicing.
- Communication with the District's Program Manager
- Between consultant project manager, staff and subconsultants. This can be accomplished through weekly, project workforce scheduling and milestone progress reports. We have a very close working relationship with all of our proposed subconsultants which is a key to a successful project with multiple disciplines.

ii) Project Development and Progress Monitoring - Establishment and Tracking of Submittal Milestones – Significant part of management includes the establishment of milestones for deliverables to the client and subconsultant deliverables to the consultant. Milestones should also include dates of District tasks that need to be accomplished for the project including record information, submittal reviews and District supplied specification sections.

iii) Resource Allocation - Workforce Scheduling and Monitoring - Weekly workforce schedule goes hand in hand with milestone target success. Schaaf & Wheeler has companywide weekly workforce meetings in which staff allocations are set in order to meet project requirements and deadlines. Workforce usage is monitored and reviewed in monthly billing cycles.

Comments on Professional Services Agreement

Schaaf & Wheeler has reviewed the District's Professional Services Agreement and we will be able to sign the agreement as is.