

Olivehurst Public Utility District



Agenda Item Staff Report

Meeting Date: 06/20/24

Item description/summary:

Approve JLR Engineering Services for Arboga Transmission Main. As additional homes and low-income housing arise in Olivehurst, it's important we look at our water system and start planning ahead for our needs. One of the first things we have done with Affinity Engineering is created a water system model and then looked at needs that would be needed within the Olivehurst system and for the future when the systems are tied together. It's important that we upsize the existing Arboga Transmission Main to 24".

Fiscal Analysis:

Cost of Olivehurst PUD Water System Model (already approved) = \$56,000
Proposal for Arboga Transmission Main (current one attached) = \$128,280
OPUD received Grant from Water Agency for \$278,250

Employee Feedback

n/a

Sample Motion:

Move forward with Design Proposal

Prepared by: Swarnjit Boyal, Public Work Engineer

EXHIBIT A – Design Proposal



2110 K Street, Sacramento, CA 95816
Tel: (916) 803-9803
Jeremy@JLREnviro.com

June 17, 2024

Swarnjit Boyal,
Public Works Engineer
Olivehurst Public Utility District (OPUD)

RE: OPUD – PROPOSAL FOR ARBOGA ROAD PIPELINE DESIGN SERVICES

Dear Swarnjit,

JLR Environmental Consultants (JLR) is pleased to submit the attached Proposal for the Olivehurst Public Utility District's Arboga Road pipeline project.

Our point of contact will be Sara Rogers, at SaraR@JLREnviro.com

Our address and phone numbers are:

Office:
2210 K Street, Suite 18
Sacramento, CA 95816
Phone: (916) 803-0012

We understand that the project includes design of a new Transmission-Main for Arboga Road from Ella Avenue to Plumas Arboga Road in the County of Yuba, CA. The new T-main is needed to enable the Wheeler Water Treatment Plant to supply water to the northern portion of the Olivehurst Water System. The T-Main will also act as the main transmission main artery that will eventually be extended to connect the Olivehurst Water System to the Plumas Lake Water system.

JLR has been providing management and engineering services for over ten years. Our team includes Sara Rogers and Tom Dugan. Both are professional engineers with over 20-years of experience in pipeline design. Sara Rogers is currently providing hydraulic modeling for the District's North Services Area. That project includes modeling to size the Arboga pipeline and provide 10% design alignment. Resumes for Sara and Tom are provided as an attachment to this proposal. Jim Carson (Affinity Engineering) will provide QA/QC review services. Surveying will be provided by Area West Engineering.

Thank you for the opportunity to provide a proposal for engineering services on the District's pipeline project. We look forward to continuing to build a strong working relationship with the District. If you have any questions or require additional information, please do not hesitate to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read 'JR', with a long horizontal flourish extending to the right.

Jeremy Rogers – President



SCOPE OF WORK

SCOPE OF DESIGN SERVICES

The following provides a detailed discussion of our scope of work. The scope of services is broken down by tasks which corresponds with the attached estimate of hours.

1.1 – Project Management

JLR will provide a proactive project management strategy that will involve close communication with the District, JLR’s subconsultants, and other project stakeholders. These efforts will be led by JLR’s Project Manager (Sara Rogers) who is well versed in managing these type of design projects. Jim Carson (Affinity Engineering) will provide QA/QC services.

JLR will submit monthly payment request (invoices) that will identify tasks and subtasks with percent complete, total invoice amount, budget billed to date and amount remaining. Included with the invoice will be a monthly progress report that will describe work completed, current activities and updated schedule for each task.

1.2 Meetings

JLR will conduct regularly scheduled meetings to review project progress and to discuss submittal reviews. We anticipate a 4-month design schedule. Our fee includes a total of 4 meetings. Most of the meetings will be one hour “MS Teams” meetings, however we anticipate two workshop review meeting at the District at the 50% and 90% stages.

Task 1 Deliverables:

- *Monthly invoicing and associated progress reports (electronic pdf files)*
- *Meeting agendas and minutes for all coordination and progress meetings (electronic word and pdf files)*

Task 2 – Design

Coordination with Existing Utilities – The gathering of information will include reviewing and incorporating requested utility information obtained through the “A”, “B”, “C” letter utility process onto the base maps from survey and mapping information obtained in Task 4.

2.1 50% Plan, Specifications, and Cost Estimates

JLR will produce 50% plan and profile drawings. The pipeline size and initial alignment will be based on the work completed during the hydraulic modeling efforts (under a separate contract). Also included in the design will be typical details for the project. Specification table of contents will be provided along with a 50% estimate of construction costs.

Surveying – Topographic surveying will be provided by Area West Engineers. The survey will include the following:

- Roadway
- Roadside ditches
- Back of sidewalk
- USA markings, *supplied by others*
- Existing survey monummentation
- Above ground utilities
- Underground facilities per facility maps, *supplied by others*
- Trees, larger than 4” diameter, *Arborist Report is not included*
- Driveways
- Fences
- Road right of way per record maps and survey monummentation
- Google Earth photo overlay

Coordination with Existing Utilities – The gathering of information will include reviewing and incorporating requested utility information obtained through the “A”, “B”, “C” letter utility process onto the base maps from survey and mapping information.

2.2 90% Plans, Specifications, and Cost Estimates

JLR will build on the 50% design plans and District comments to complete a 90% set of documents that will include all required plans and profile sheets, detail sheets, and a complete specification book that would be considered a biddable set of documents. JLR will incorporate the District’s “Front End” specifications to provide a complete set of project specifications. Also included will be a 90% opinion of probable construction cost with supporting cost documentation.

2.3 Bid Ready Contract documents

The 100% Design will incorporate District review comments from the 90% design to have the complete design documents (plans and specifications) ready for



bidding. Also included with the 100% design documents will be the final Engineer's estimate.

Task 2 Deliverables:

- *Draft and Final 50%, 90%, and final contract documents (PDF versions).*

EXCLUSIONS

Our scope and fee excludes the following:

- Permitting – including environmental, encroachments, and any DDW permitting required.
- Geotechnical services are not included.
- Potholing for existing unities is not included.
- All bidding and construction services are excluded at this time.



JLR ENVIRONMENTAL CONSULTING SCHEDULE OF FEES

Olivehurst Public Utility District								
Arboga Road Pipeline - Design Fee Estimate								
Tasks	Labor			Total Hours	Total Labor Costs ¹	Outside Services		Total
	Principal	Project Manager	Drafter			Area West Engineering	Sub Consultant Total Cost (2)	Total Fee
	PIC	PM/PE	CAD/EIT			Survey		
	\$200	\$185	\$135					
Task 1: Project Management and Meetings								
1.1 Project Management	40	12		52	\$10,220		\$0	\$10,220
1.2 Meetings (Assume 4)	16	16		32	\$6,160		\$0	\$6,160
Subtotal Task 1:	56	28	0	84	\$16,380	\$0	\$0	\$16,380
Task 2: Design								
2.1 50% Plans, Specs, and Cost Estimate	24	80	120	224	\$35,800	\$25,000	\$27,500	\$63,300
2.2 90% Plans, Specs, and Cost Estimate	32	60	100	192	\$31,000		\$0	\$31,000
2.3 Bid Ready Contract Documents	24	40	40	104	\$17,600		\$0	\$17,600
Subtotal Task 2:	80	180	260	520	\$84,400	\$25,000	\$27,500	\$111,900
TOTAL	136	208	260	604	\$100,780	\$25,000	\$27,500	\$128,280

1. The individual hourly rates include salary, overhead and profit.

Assumes that all submittals will be electronic (PDFs)

2. Sub-consultant fees include a 10% mark-up



RESUMES

A resume is included as an attachment to this proposal for the following key team members:

Sara Rogers – Project Manager

Tom Dugan – Project Engineer



SARA ROGERS, P.E., QSD

RELEVANT EXPERIENCE

Arden Service Area Pipe and Meter Installation Project – Sacramento County Water Agency | *Project Role: Project Manager/Engineer-of-Record*

Ms. Rogers currently provides on-going project management and engineering service during construction for SCWA's Arden Service Area pipe and meter installation project, which includes over 38 miles of pipelines and 3,000-meter installations. The project is a multi-phase design which started in 2016. Services also include hydraulic modeling and preparation of an implementation plan with proposed phasing. Project includes a transmission main (16-inch DIP) along Fair Oaks Boulevard from Watt Avenue to Howe Avenue. Project also included crossing the intersection of Watt and Fair Oaks with dual 12-inch pipelines. Three phases of the project have been constructed with three more under design or starting construction. Phases 1A and 2A of the project have been awarded ASCE Sacramento Section project of the year. Phase 2A was awarded the Region 9 ASCE project of the year for 2020.

State Street Water Capacity and Sewer Rehabilitation Project – City of West Sacramento | *Project Role: Project Manager*

Ms. Rogers served as the project manager along with providing design assistance for the project. The project included preparing plans, specifications, and cost estimate for approximately 10,000 feet of new water main and rehabilitating approximately 38,000 feet of gravity sewer main within the City of West Sacramento's State Street area. An extensive assessment of the existing sewer system was conducted to determine which sections required replacement and which could be rehabilitated using structural pipe lining. The project also included reconnecting 213 metered water services and approximately 500 sewer lateral reconnections. The project was awarded the ASCE Sacramento Section Sewer project of the year for 2020.

Downtown Water Main Replacement Project – Hillcrest Neighborhood – City of Roseville (COR) | *Project Role: Project Manager*

As part of the COR's design-assist team, Ms. Rogers and team collaborated with the COR to prepare the bid plans and specifications for approximately 19,500 feet of pipe, provided bid support and review of the bid proposal, and is currently providing engineering services during construction. This involves preparing the final construction plans based on field data obtained by the contractor, preparing design clarification memos, reviewing submittals, and participating in project meetings.

Watt Main Extension Project – Sacramento Suburban Water District | *Project Role: Project Manager/Engineer-of-Record*

Provided design plans, specifications, and cost estimate for over 4,500 feet of 16-inch mainline extension along Watt Avenue. The project provides looping for the system to increase redundancy. The design included a 100-foot bore and jack across Sierra Creek. The B&J included a 28-inch steel casing pipe at an approximate 20-foot depth. An easement was negotiated with a private property owner to allow the creek crossing to be constructed outside of the roadway. Services included system hydraulic modeling, a preliminary design report, easement acquisition for a creek crossing, and permit coordination with Sacramento County, California Department of Fish and Wildlife (for the Streambed Alteration Agreement), and the Division of Drinking Water (DDW).

PROFILE

Ms. Rogers's experience includes water systems, agricultural, and water resources engineering. She has extensive experience in pipeline design including mainline replacement and meter retrofits, permitting, hydrologic and hydraulic studies, pump station design, river and stream restoration and hydraulic structure design.

PROFESSIONAL ENDEAVORS

JLR Environmental Consulting 2018 to present.

D&A Engineering, Inc. 2003 to 2023

HDR Engineering, Inc., 2001 to 2003

Irrigation Training and Research Center (ITRC), 1997 to 2001

EDUCATION

B.S., BioResource and Agricultural Engineering, California Polytechnic State University, SLO, 2000

M.S. Water Engineering, California Polytechnic State University, SLO, 2001

REGISTRATION

Professional Civil Engineer, 2003
California No. 64226

CASQA Certified QSD/P Certificate No. 00418

SPECIALIZED TRAINING

CASQA Training for the 2022 CGP Update

Caltrans 8-Hour Water Pollution Control Manager (WPCM) Training – 2022

Qualified SWPPP Developer Training – September 2010

XP-SWMM (including 2D), Training Course, Sacramento, CA April 2008.

Feasibility Analysis for I-80 Water Crossings – City of Roseville |
Project Role: Project Manager

Evaluated the feasibility and cost impacts related to replacing three existing water line crossings under Interstate 80 due to a Caltrans widening project that requires all crossings to meet Caltrans standards. The analysis mapped out existing features, existing utilities, soil types, and provided proposed alignments, construction methods and costs, and construction schedule time frames.

Paloma Well Rehabilitation – South Tahoe Public Utility District (STPUD) | *Project Role: Project Management and Engineer-of-Record*

Provided STPUD assistance with preparing specifications for the rehabilitation of a 2,000 GPM well in the District. Well rehab includes line brushing, debris removal, and partial liner installation. Once rehab is complete a pump test will be conducted to provide a final pump design for procurement and installation. Provided engineering services during construction.

Town Center Force Main Project – Phase 1 – El Dorado Irrigation District (EID) | *Project Role: Project Manager and Engineer-of-Record*

Constructed in 2014. Provided design, plans and specifications for over 1,000 feet of 10-inch sewer force main. The project installed the new main in the right-of-way along with connecting existing laterals. Engineering services also included pipeline design, bidding assistance, utility coordination, engineering services during construction and construction management.

Antelope Pump Station Project, Sacramento Suburban Water District (SSWD) | *Project Role: Project Manager*

Provided project management for SSWD's Antelope Pump back project. The project allows groundwater to be pumped from SSWD's system to San Juan Water District (SJWD)'s system through the Cooperative Transmission Pipeline. The ultimate capacity of the station is 15,000gpm with three 5,000gpm pumps. A fourth 3,000gpm pump would provide water to a separate low-pressure zone in the SSWD system. The pump station was constructed with two pumps (10,000gpm capacity).

Barton Road Intertie, San Juan Water District (SJWD) | *Project Role: Project Manager*

Construction was completed in 2015. Provided design, plans and specifications for over 2,250 feet of 12-inch ductile iron pipeline installed within Barton Road and the design of a joint lift station and pressure reducing station that serves as the intertie between San Juan Water District and Placer County Water Agency. Engineering services also included bidding assistance, utility coordination and engineering services during construction.

Mother Lode Force Main, Phase 3A-C, El Dorado Irrigation District |
Project Role: QA/QC/SWPPP Preparation

Project included preparing contract plans and specifications for the three phased sewer force main project along Pleasant Valley Road and Mother Lode Drive. Each phase was approximately 1-mile; Phase 3A installed 18-inch DR 18 PVC and Phase 3B & 3C installed 20-inch DR18 PVC. The new force main replaced the remaining segments of 12-inch ACP force main within the Mother Lode Force Main system that were undersized and failing. The new force main was installed primarily within El Dorado County right-of-way; though a portion was installed in a cross-country section that connected to the EID Mother Lode Lift Station. Phase 3B and 3C each included a creek crossing to be installed by bore and jack method. The design included realignment of 4 -inch and 12-inch water main and 2-inch water service pipe, and replacement of a 6-inch gravity sewer.

Well 16 Pump Station and Pipeline Project – Rio Linda/Elverta Community District (RLECWD) | Project Role: Project Manager and Engineer-of-Record

Provided coordination with RLECWD and various permitting agencies and overall management in the preparation of the plans and specifications for 1,500-gpm pump station project. Project consists of new pump pedestal and discharge piping, control building, hypochlorite disinfection, treatment drainage basin, emergency generator, sound wall, security iron fencing, automatic sliding gate, drought-tolerant landscaping, and approximately 2,000 feet of 8- and 12-inch ductile iron pipe to tie into existing system and loop two dead-end water mains.

Backwash Tank Replacement Project – Grizzly Flats Community Services District | Project Role: Project Manager/QA/QC

The project included replacement of an existing, aging bolted steel backwash tank at the Grizzly Flats Water Treatment Plant. The existing tank was marginal in size, causing occasional overflows of backwash water. The design included a larger welded steel tank with an epoxy paint coating. Design also included new supply and discharge piping with seismic isolation joints.

Tank Improvements Project – City of Folsom | Project Role: Project Manager/QA/QC/Design

The project included the design of the rehabilitation of one tank and recoating the exterior of two others. In addition to recoating, the improvements included rerouting the supply and discharge piping from the tank bottom to sidewall connections, adding seismic movement joints, a spiral staircase to replace the existing ladder, cathodic protection, larger redesigned manways, removal of an existing abandoned pump station, as well as electrical and security improvements.

Lower Banvard Canal Pipeline Replacement Project, Placer County Water Agency (PCWA) | Project Role: Project Manager

Provided design plans, specifications, and cost estimating to replace 240 feet of 20-inch steel pipe traversing Interstate 80 within a 30-inch concrete pipe and replacing approximately 50-feet of 20-inch steel pipe within the **Interstate's Road** embankment. The replacement pipe is constructed of 20-inch fused PVC pipe installed within the existing 30-inch casing and new 20-inch steel pipe installed within the Interstate Road embankment. The design included preparing the necessary Caltrans encroachment permit documentation and supporting PCWA during the encroachment permit process. The project included providing bid support and engineering services during construction.

Jonas Water Main Replacement Project – Sacramento Suburban Water District (SSWD) | Project Role: Project Manager and Engineer-of-Record

Provided design plans and specifications for over 12,000 feet of 12-inch, 8-inch and 12-inch mainline replacement. Services included pipeline alignment, public outreach, bidding assistance and coordination with utilities, and obtaining an encroachment permit. Project also included obtaining easements for the new pipeline improvements.

Rocklin Front Yard Water Main Replacement Project – Placer County Water Agency (PCWA) | Project Role: Project Manager and Engineer-of-Record

Provided design, plans and specifications for over 10,000 feet of 4-inch, 6-inch, 8-inch, and 12-inch ductile iron mainline replacement. The project abandoned old, deteriorated mains and fire hydrants and installs new mains in City right-of-way along with new fire hydrants and reconnection of existing meters. Engineering services also include pipeline design, obtaining an encroachment permit, bidding assistance, utility coordination and

engineering services during construction. Project involved significant public outreach including development informational materials and presentations for multiple public meetings

Whitney Boulevard Water Main Replacement Project – PCWA |

Project Role: Project Manager

Provided plans and specifications for over 4,100 feet of 18-inch ductile iron mainline replacement. The project installed new mains in City right-of-way along with new fire hydrants and reconnected 79-meter services.

Engineering services include pipeline design, obtaining an encroachment permit, bidding assistance, utility coordination and engineering services during construction. The project received the ASCE Sacramento Section Water project of the year for 2021.

Pardi Way/Big Cut Rd/Sacramento Street Water Main Replacement Project, City of Placerville | Project Role: Project Manager

Provided design, plans, and specifications for over 4,000 feet of 6-inch, 8-inch and 12-inch PVC mainline replacement. The project abandoned old backyard mains and fire hydrants and installed new mains in Caltrans and City right-of-way along with new fire hydrants and reconnections to 46 metered services. Engineering services included pipeline design, obtaining a Caltrans encroachment permit, bidding assistance and utility coordination and engineering services during construction.

Jenny Lind Elevated Tank Project – Calaveras County Water District (CCWD) | Project Role: Project Manager

Design and engineering services during construction for the Tank 602 Replacement Project. D&A prepared a bid package for the purchase of the new proposed elevated tank and created plans and specifications for the new elevated tank, associated piping and valves, SCADA, and electrical controls.

Big Trees Tank Replacement – CCWD | Project Role: Project Manager

Project included design for two new glass-lined bolted steel tanks to replace the existing redwood tanks in the Big Trees system. The redwood tanks were located in a forested area and are a potential fire hazard. One of the new tanks is located on California State Parks owned property and required a revision to the existing easement. Ms. Rogers provided assistance with State Parks coordination to revise the easement and address environmental concerns. The new tanks replaced the existing capacity at 150,000 gallons and 80,000 gallons.



TOM DUGAN, P.E., QSD

RELEVANT EXPERIENCE

Arden Service Area Pipe and Meter Installation Project, Phase 1B, Sacramento County Water Agency | Project Role: Project Engineer and Engineer-of-Record Currently providing on-going design and engineering services during construction for SCWA's Arden Service Area (ASA) pipe and meter installation project, Phase 1B and is one phase of a multi-phased water main and meter installation project that began in 2016. The ASA Phase 1B project includes approximately 6 miles of pipeline (16-inch to 6-inches) and will bring approximately 300 commercial properties and private multi-unit complexes into compliance with AB 2572 and current County backflow prevention standards and requirements. The project work is along two along two major roads and multiple minor roads that run through the ASA project; work will involve both day and night work and a significant amount of traffic control. The project also includes multiple interties with an adjacent water purveyor.

South Riverwalk Extension Project, City of West Sacramento | Project Role: Project Manager Currently serving as an extension of staff to the City Capital Project Department. The Project includes the development of 1,500 feet of Sacramento River front that will include a public promenade with decorative landscape and recreational features. The promenade will be a Class 1 path that will serve as an operational and maintenance corridor to Reclamation District 900 and emergency first responders. The project includes close coordination and permitting with the Central Valley Flood Protection Board, land acquisition with private landowners, coordination with City Council and general public.

State Streets Water Capacity and Sewer Rehabilitation Project, City of West Sacramento | Project Role: Project Engineer.

The Project received ASCE's 2020 Outstanding Utilities Award. The design included preparing plans, specifications, and cost estimate for approximately 10,000 feet of new water main and rehabilitating approximately 38,000 feet of gravity sewer main within the CoWS State Street area. The sewer design includes coordinating the Television Inspection (TVI) subconsultant and conducting a condition assessment of the entire gravity sewer system. Based on the condition assessment, rehabilitation recommendations are being made using either cured-in-place pipe (CIPP) or a full remove and replacement of the sewer main. The project includes reconnecting to approximately 500 sewer laterals.

Town Center Force Main Project Phase 4, El Dorado Irrigation District | Project Role: Project Engineer. The design includes preparing plans, specifications, and cost estimates for the replacement of approximately 3,300 linear-feet of failing 8-inch AC sewer force main pipe with new 10-inch PVC pipe. This includes replacing approximately 250-feet of encased 8-inch sewer pipe across a Caltrans overpass, installing three ARV assemblies, making tie-ins to the existing lift station and existing force main. The design includes two vehicle pull-out locations along the alignment and facility improvements at the lift station. Engineering services includes assisting with obtaining a County encroachment permit and Caltrans encroachment permit, bid support, and engineering during construction.

Town Center Force Main Project Phase 3, El Dorado Irrigation District | Project Role: Project Manager/Engineer. The design included preparing plans, specifications, and cost estimate for replacing approximately 4,100 linear-feet of failing 8-inch AC sewer force main pipe with new 10-inch PVC pipe. This included installing a new 20-inch steel casing under an existing railroad and 50 feet of 10-inch fused PVC pipe, a check valve structure, and

PROFILE

Mr. Dugan is a licensed civil engineer with over 25 years of experience in water and wastewater project planning, infrastructure design, and construction management services. He has experience working on a range infrastructure project; the largest being 16-miles of 84-inch, 72-inch, and 60-inch diameter water transmission line for A JPA between the Sacramento County Water Agency and East Bay MUD. His design and construction management experience gave him the foresight to anticipate design conflict and the ability to address issues promptly during construction.

PROFESSIONAL ENDEAVORS

Dugan Management & Engineering, Inc
June 2023 - Present

D&A Engineering, Inc. 2013 to May 2023
RMC Water and Environmental, Sacramento, 2004 to 2013

GEI Consultants, Inc. Sacramento, 1999 to 2004

EDUCATION

B.S., BioResource and Agricultural Engineering, California Polytechnic State University, SLO, 1999

REGISTRATION

Professional Civil Engineer, 2006
California No. 68171

Qualified SWPPP Developer, CASQA, 2011, QSD #000288

Grade D1 Water Distribution Operator
No. 44523, 2014

SPECIALIZED TRAINING

Certified Cured-In-Place Pipe Inspector, NASSCO, 2012

Construction Management Certification, UC Davis, Extension, 2009

AFFILIATIONS

Sacramento Area Water Works Association (SAWWA)

American Society of Civil Engineers

American Public Works Association (APWA)

Construction Management Association of America (CMAA)

two tie-ins to existing sewer force main. Engineering service included design coordination with the El Dorado Irrigation District, El Dorado County DOT, and Sacramento Placerville Transportation Corridor JPA; assisting in obtaining a County encroachment permit; and will include bid support and engineering during construction.

Town Center Force Main Project Phase 2, El Dorado Irrigation District

| Project Role: Project Engineer. The design included prepared plans, specifications, and cost estimates for installing approximately 4,600 linear feet of new 10-inch sewer force main, two combination air vent assemblies, two 4-inch blow-offs, reconnecting two pumped service connections, and the abandonment of the existing 8-inch AC sewer force main and appurtenances. Engineering service included assisting the District obtain the County encroachment permit, bid assistance, and engineering service during construction.

Town Center Force Main Project - Phase 1, El Dorado Irrigation District

| Project Role: Project Engineer. Provided design, plans and specifications for over 1,000 feet of 10-inch sewer force main. The project installed the new main in the right-of-way along with connecting existing laterals. Engineering services also include pipeline design, bidding assistance, utility coordination, engineering services during construction and construction management.

City Creek Turnout and Pipeline, East Valley Water District, Highland, California

| Project Role: Project Engineer. Provided design, plans and specifications for over 1,500 feet of 18-inch ductile iron pipeline, turnout facility and site piping. The project proposes to install the pipeline within an existing levee, which crosses a major roadway, supplying water to East Valley Water District's existing water treatment plant for the proposed hydroelectric operations occurring within the plant. Engineering services also include pipeline design, hydroelectric station design, structural facility design, identifying necessary encroachment permits, bidding assistance, utility coordination and engineering services during construction.

Mother Lode Force Main, Phase 3A-C, El Dorado Irrigation District

| Project Role: Project Manager and Sr. Engineer. Prepared contract plans and specifications for the three phased sewer force main project along Pleasant Valley Road and Mother Lode Drive. Each phase was approximately 1-mile; Phase 3A installed 18-inch DR 18 PVC and Phase 3B & 3C installed 20-inch DR18 PVC. The new force main replaced the remaining segments of 12-inch ACP force main within the Mother Lode Force Main system that were undersized and failing. The new force main was installed primarily within El Dorado County right-of-way; though a portion was installed in a cross-country section that connected to the EID Mother Lode Lift Station. Phase 3B and 3C each included a creek crossing that use bore and jack method. Each Phase had several pumped to sewer laterals if not a sewer lift station reconnection. The design included evaluating air vent sizing, blow offs, realignment of 4 -inch and 12-inch water main and 2-inch water service pipe, and replacement of a 6-inch gravity sewer.

Lower Banvard Canal Pipeline Replacement Project, Placer County Water Agency (PCWA)

| Project Role: Project Engineer. The Project received ASCE's 2021 Small Project of the Year Award. The Project included preparing design plans, specifications, and cost estimating to replace 240 feet of 20-inch steel pipe traversing Interstate 80 within a 30-inch concrete pipe and replacing approximately 50 feet of 20-inch steel pipe within the Interstate's Road embankment. The replacement pipe is 20-inch fused PVC pipe installed within the existing 30-inch casing and new 20-inch steel pipe installed within the Interstate Road embankment. The design included preparing the necessary Caltrans encroachment permit documentation and supporting PCWA during the encroachment permit process.