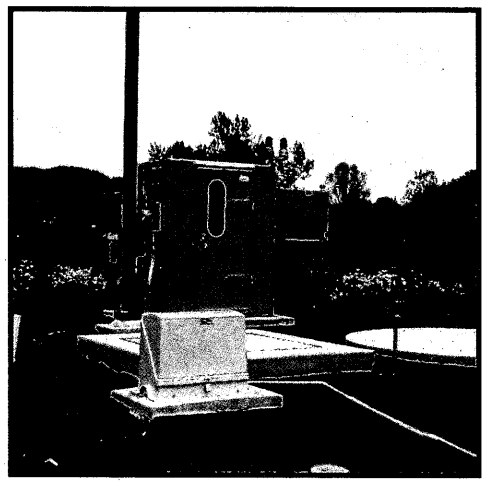
SPRINGFIELD OREGON

Proposal for RFP: Engineering Services

SCOPING, DESIGN, AND INSTALLATION OF THE JASPER TRUNK SEWER P20353



MSA
Murray, Smith & Associates, Inc.
Engineers/Planners

OBEC CONSULTING ENGINEERS

City of Springfield, Oregon

June 18, 2009

MSA
Murray, Smith & Associates, Inc.
Engineers/Planners
175 West B Street, Bldg. K-2 ▪ Springfield, Oregon 97477 ▪ PHONE 541.741.2975 ▪ FAX 541.744.3875

June 18, 2009

City of Springfield
Finance Department
Attn: Leslie Wilson, Management Analyst
225 Fifth Street
Springfield, Oregon 97477

Re: RFP: Engineering Services for Scoping, Design and Installation of the Jasper Trunk Sewer P20353 – MSA Proposal for Engineering Services

Dear Ms. Wilson:

Murray, Smith & Associates, Inc. (MSA) is pleased to submit this engineering services proposal to the City of Springfield for the above-referenced Jasper Trunk Sewer project. MSA is highly qualified for this assignment and the project is a top priority for our firm and our newly established Springfield office.

Our team is structured for strong local involvement with the inclusion of OBEC Consulting Engineers to assist with surveying and other support services. Geotechnical engineering will be provided by Foundation Engineering, Inc. and right-of-way acquisition assistance will be provided by Universal Field Services, Inc. Our firm has an excellent work history with these partner subconsultant firms.

Engineering on the project must properly address a number of key issues, including: updated planning and hydraulic analysis; pipeline routing selection; potential railroad crossings; private property/right-of-way/easement acquisitions; wetlands and creek crossings; rock excavation; deep excavations; confined corridors; pipe material selections; environmental permitting; and other interests. In addition to our recent sewer work for the City of Springfield, the MSA team has addressed these issues on similar recent projects for the cities of Gresham, West Linn, Oregon City, Wood Village, Medford and Portland, as well as for Clatsop County and Clean Water Services (Washington County, Oregon).

Our team includes experienced lead individuals who are familiar with Springfield's standards, procedures and expectations through prior, successful sewer work for the City. Phil Smith, P.E., one of MSA's founding partners, will serve as principal-in-charge. He has served in this capacity on MSA's recently completed sewer rehabilitation work for the City. Kyle McTeague, P.E. will serve as our team's project manager. Kyle has over 17 years experience with the firm and managed MSA's recent design work for the Springfield sewer

rehabilitation project that is presently under construction. Matt Hickey, P.E., an MSA principal engineer with 16 years of sewage system and pipeline conveyance engineering experience, will serve as project engineer. OBEC's Jerry Lane, P.E. will coordinate and manage their firm's work as part of the lead team. MSA's local Springfield office manager, Bill Hollings, P.E., will serve as construction manager, with Mark Smith assigned as our team's field inspector during construction. Bill and Mark are both involved in MSA's current sewer construction management for the City. This team brings proven performance on prior work for the City and other local/regional public agencies and is excited at the opportunity to serve Springfield on this key project.

Much of MSA's work is completed on tight or extremely fast-track schedules. We are known for our "can-do" attitude and our commitment to delivering complicated projects on time and within budget. We are dedicated to high quality and high value and that is our promise to the City on this project.

Minimum Mandatory Requirement (Criteria No. 1): MSA acknowledges that all aspects of the work as outlined in the Request for Proposals and the scope of work will be provided and will be completed within the time schedule indicated in the draft Agreement.

We look forward to the opportunity to review our proposal with the City. In the meantime, if we may offer any further information or answer any questions, please feel free to contact us. Thank you.

Sincerely,

MURRAY, SMITH & ASSOCIATES, INC.

Philip H. Smith, P.E.
Founding Principal

PHS:djs

Enclosures

MSA

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SPRINGFIELD OREGON

ATTACHMENT 2

Authorization to Legally Bind Proposer

The person executing this Proposal and the instruments referred to herein on behalf of the Proposer have the legal power, right, and actual authority to submit this Proposal, and to bind the Proposer to the terms and conditions of this Proposal.

(Signature of person authorized to bind Proposer)	6/18/09 **Dated**
Philip H. Smith, P.E. **Print Name of Person Signing as authorized to bind Proposer**	
Murray, Smith & Associates, Inc. **Firm Name**	503.225.9010 **Phone**
121 SW Salmon, Suite 900 **Address**	503.225.9022 **Fax**
Portland, OR 97204 **City, State, Zip**	phs@msa-ep.com **email address**

Firm Overview

Murray, Smith & Associates, Inc. (MSA) is a Pacific Northwest regional firm with offices in Portland, Oregon; Springfield, Oregon; Everett, Washington and Boise, Idaho. Many of the region's municipalities and districts currently depend on MSA's engineering services to deliver their most important capital projects on time and within budget. This reputation has grown from MSA's proven track record, dependability, strong sense of client loyalty, no-nonsense approach, constant and consistent professionalism, and our absolute commitment to excellent service. Municipalities rely on MSA's excellent service, knowing that their communities will benefit from solid advice and engineering focus on long-term performance.

MSA is uniquely qualified and suited for this sewer project work with the City of Springfield due to our extensive sewer system engineering experience, our familiarity with the City of Springfield's wastewater system, our commitment of principal level staff, our business focus on municipal engineering service to public agencies and our local office location that ensures optimal efficiency and immediate responsiveness to any and all project issues. Most of our firm's current work is repeat business, a testimony to the trust and confidence our clients have in MSA's professional staff and capabilities. We are pleased to have had the opportunity to prove our performance to the City on prior work and will deliver similar top value to Springfield.

MSA was founded in 1980 based on a business plan that focused on providing high-quality/high-value engineering services to public agencies throughout the Pacific Northwest. We have remained true to our business plan as we have expanded our service capabilities and client base over the past 29 years and completed over 1,000 projects for over 185 public agencies. MSA's strong wastewater system planning and analysis experience and expertise, combined with our comprehensive design and construction management capabilities, provides the City of Springfield with the assurance that project designs will meet current needs as well as long-range service objectives.

Project Team

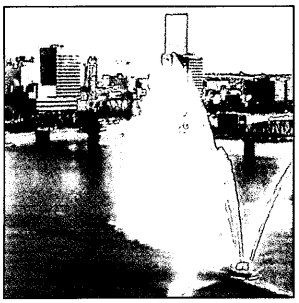
MSA is pleased to include on our team the local firm of OBEC Consulting Engineers (OBEC) to assist with project surveying and permit-related services, traffic engineering, environmental science-related services, and pavement assessment services. Geotechnical engineering will be provided by the Southern Willamette Valley firm, Foundation Engineering, Inc. (FEI). Universal Field Services, Inc. (UFS) will assist with right-of-way acquisitioning. David J. Collins Engineering (DJCE) will serve as a technical advisor on hydraulic modeling associated with the City's existing comprehensive sewer system model. MSA has completed numerous successful projects with this team and we are confident of the superb value we deliver to the City. MSA will conduct and manage all sewage system analyses, designs and general civil engineering, will oversee all subconsultant work, and will manage all aspects of the project. Firm profiles for MSA and other subconsultant team members follow.

MSA

Firm Profiles

Murray, Smith & Associates, Inc.
Engineers/Planners

Firm Profile



Serving the Pacific Northwest Public Works Industry Since 1980

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Boise, Idaho
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Boise, ID 83702
(208) 350-2250

www.msa-ep.com

Murray, Smith & Associates, Inc. (MSA) was established in 1980 to provide high quality civil and environmental engineering to municipalities and public agencies. In addition to providing general consultations through our many on-going continuous service arrangements, MSA offers a full range of services from project inception through construction completion. We have completed public facilities planning and many multi-discipline design assignments and are particularly well known for our ability to effectively and efficiently carry out challenging complex public infrastructure projects.

Wastewater

- Wastewater Facilities Planning
- Collection System Analysis/Basin Modeling
- Wastewater Pump Stations
- Gravity Sewers & Force Mains
- Innovative Technologies/On-site Systems
- System Conversions
- Wastewater Treatment Facilities
- Effluent & Reclaimed Water/Drainfields
- NPDES Permitting & Compliance
- Biosolids Handling & Beneficial Use
- Combined Sewer Overflow (CSO)
- Infiltration & Inflow (I&I) Improvements
- Odor & Corrosion Control

Water

- Water Supply Planning & Development
- Distribution System Master Planning
- Water Resource Management & Conservation Planning
- Reservoirs, Dams, Pump Stations & Wells: Siting, Studies & Design
- Hydraulic Modeling & Analyses
- Transmission & Distribution Pipeline Routing Studies & Design
- Corrosion Control/Cathodic Protection
- Water Treatment
- Metering & Flow Control Systems
- Water Rights
- Aquifer Storage and Recovery (ASR)
- River Intakes/Stream Diversions
- Hydroelectric Feasibility

Stormwater

- Stormwater Basin Analysis & Master Planning
- Hydrologic & Hydraulic Modeling
- On-site Detention, Retention & Water Quality Analysis & Design
- Drainage Piping & Culvert Design
- Wetlands Design
- Combined Sewer Separation
- CSO Control/Pollution Control
- On-site Retention Systems
- Special Inlet Structures & Outfalls
- Fish Passage Design
- Water Resource Management Planning

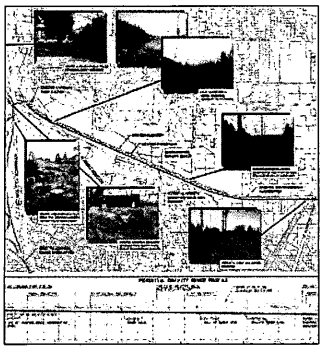
Transportation

- Street, Road Planning & Design
- Traffic, Routing & Alignment Studies
- Bridge Engineering
- Downtown Plan Improvements
- Utility Undergrounding & Streetscaping
- Intersection Realignments
- Signalization Improvements
- Subsurface Utility Engineering (SUE)
- Landslide Related Road Repairs
- Integrated Road & Utility Designs
- Interagency Coordination
- Road Culvert/Fish Passage Enhancements

Specialties

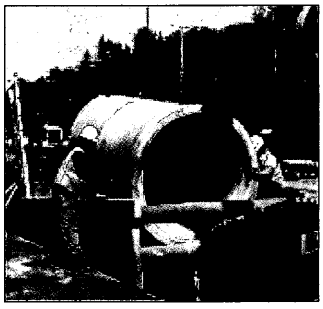
- On-call General Consulting
- City/District Engineering
- Program Management
- Public Works Construction Contract Administration
- Plan/Development Reviews
- Intergovernmental Agreements
- Rates, Finance, Grants & Loans
- Land Use Permitting
- Environmental Permitting
- Environmental Compliance & Mitigation
- Vulnerability Assessments & Emergency Action/Response Planning
- Seismic Retrofits/Rehabilitation
- Commercial/Industrial Facilities
- Marine Facilities
- Natural Gas Facilities
- Trenchless Technologies
- Instrumentation & Control
- CADD/Mapping/GIS
- Utility Coordination

Experience Highlights – Wastewater Conveyance



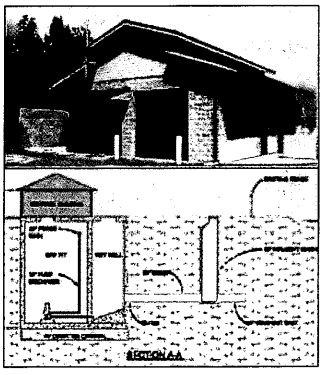
Alternatives Analysis Studies

- Belfair/Lower Hood Canal Water Reclamation Facility Plan, Mason County, WA
- Wastewater Facility Plan, City of Dundee, OR
- Gravity Sewer Feasibility Study (Linneman Tunnel), City of Gresham, OR
- South Airport Basin Sanitary Sewer Project – Sewerage Facilities Plan, City of Portland, Bureau of Environmental Services, OR
- Royal Highlands Sanitary Sewerage Facilities Plan/Royal Highlands Pump Station and Force Main, City of Portland, Bureau of Environmental Services, OR
- Seely Ditch Sanitary Sewer Replacement Project, City of Wilsonville, OR



Pipe Conveyance -- Pipeline Design

- Sanitary Sewer Rehabilitation, City of Springfield, OR
- Sewer System Capacity Improvements "K" (Central City Interceptor Sewer), City of Everett, WA
- Garthwick Combined Sewer Project, City of Portland, Bureau of Environmental Services, OR
- Miles Crossing Vacuum Sewer System Project, Clatsop County and Miles Crossing Sanitary Sewer District, Clatsop County, OR
- Wastewater Trunk Sewer Improvements, City of Gresham, OR
- OSCI Sanitary Sewer System Project, Phase 2, Oregon State Department of Corrections



Pump Stations/Force Main Analysis and Design

- Miles Crossing Vacuum Sewer System Project, Miles Crossing Sanitary Sewer District/Clatsop County, OR
- River Road Pump Station and Force Main Project, Clean Water Services, Washington County, OR
- Sherwood Sewage Pump Station Rehabilitation, Clean Water Services, Washington County, OR
- Sanitary Sewer Lift Station Improvements Project, City of Oregon City, OR
- Willamette Lift Station Evaluation and Upgrade, City of Lake Oswego, OR
- Alternative 4 Sanitary Sewer Improvements, City of Wood Village, OR
- Utilities Service Extension to the Washington State Department of Corrections Stafford Creek Corrections Center, City of Aberdeen, WA

Hydrologic/Hydraulic Modeling for Project Design

- Sewer Model Review Calibration and Support, Capital Improvement Plan Development, City of Bend, OR
- Wastewater Treatment Plant Outfall Pipeline Improvements, City of Sheridan, OR
- Garthwick Combined Sewer Project, City of Portland, Bureau of Environmental Services, OR
- Jenne Road – Pleasant Valley Interceptor, City of Gresham, OR
- Water Reuse Feasibility Study, City of Cottage Grove, OR

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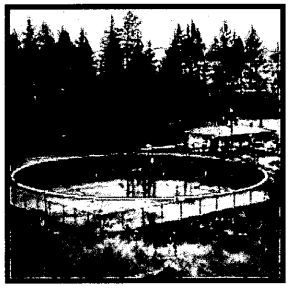
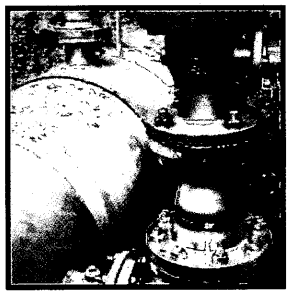
Wastewater





Wastewater system planning and facilities design is a major component of Murray, Smith & Associates, Inc.'s (MSA's) business. MSA has completed numerous wastewater system facilities plans for Northwest public agencies and the firm has completed design, permitting and construction management services as part of many sewerage system improvement programs. The firm is experienced with all aspects of municipal wastewater collection, conveyance, pumping, treatment and effluent discharge.

In addition to work for several agencies on a long-term continuing services basis, MSA has assisted many local public agencies with the development of wastewater system planning and design standards. MSA proactively applies trenchless technologies and other innovative technologies to the design and construction of sewerage system improvements. MSA has engineered one of the region's largest vacuum sewer systems and has completed numerous successful combined sewer overflow (CSO) projects.

MSA places high importance on low-impact, sustainable, "green" alternatives, such as reclaimed water reuse, applying appropriate technologies with constant view to long-term value, serviceability and sustainability.

Key Expertise

- Comprehensive Wastewater Facilities Planning
- Collection System Analysis/Basin Modeling
- Wastewater Pump Stations
- Gravity Sewers and Force Mains
- Trenchless Technologies and Sewer Rehabilitation
- On-site Systems and Innovative Technologies
- Wastewater Treatment Facilities
- Water Reclamation and Reuse
- NPDES Permitting and Compliance
- Biosolids Handling and Beneficial Use
- Combined Sewer Overflow (CSO)
- Infiltration and Inflow (I&I) Improvements
- Odor and Corrosion Control

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SUMMARY OF MSA SANITARY SEWER AND STORM DRAINAGE EXPERIENCE				
Public Agency Client	Type of Service			
	Master Plans/Studies		Designs	
	San. Sewer	Storm Dr.	San. Sewer	Storm Dr.
City of Aberdeen, WA	X		X	
City of Arlington, WA	X		X	
City of Beaverton, OR			X	X
City of Columbia City, OR	X	X		X
City of Cottage Grove, OR	X		X	
City of Dundee, OR	X			
City of Everett, WA	X		X	
City of Forest Grove, OR		X		
City of Gladstone, OR			X	
City of Gresham, OR	X		X	
City of Hillsboro, OR	X		X	
City of Kelso, WA			X	
City of King City, OR		X		X
City of Lake Oswego, OR			X	
City of Marysville, WA	X		X	
City of Milwaukie, OR			X	
City of Mt. Angel, OR		X		X
City of North Plains, OR		X		X
City of Oregon City, OR			X	
City of Portland, OR	X	X	X	X
City of Salem, OR			X	
City of Sheridan, OR	X	X	X	X
City of Sherwood, OR	X	X		
City of Snoqualmie, WA	X			
City of Springfield, OR	X		X	
City of St. Helens, OR		X		
City of Tigard, OR			X	X
City of Troutdale, OR			X	
City of West Linn, OR	X	X	X	X
City of Wilsonville, OR			X	
City of Wood Village, OR			X	
Clackamas Community College		X		X
Clatsop County, OR			X	
Clean Water Services, OR	X	X	X	
Mason County, WA	X			
McMinnville Water and Light, OR				X
Miles Crossing Sanitary Sewer District, OR			X	
Oak Lodge Sanitary District, OR			X	X
Oregon Dept. of Transportation		X		X
Oregon State Dept. of Corrections			X	
Parkdale Sanitary District	X			
Port of Portland, OR	X	X	X	X
US Fish & Wildlife Service		X		
Water Environment Services (formerly Tri-City Service Dist.), Clackamas County, OR			X	

OBEC CONSULTING ENGINEERS

Since 1966, OBEC Consulting Engineers has provided high quality engineering services to meet the transportation and municipal infrastructure needs of Oregon's communities. Our expert staff provides superior service to a range of public agencies, including the Oregon Department of Transportation (ODOT), cities, counties and park districts. OBEC offers our clients a full spectrum of engineering services, including site development and feasibility studies, preliminary and final design, specification writing, construction estimating, construction inspection and contract administration, along with associated technical and client support services. We also provide project-related environmental services, including environmental permitting, inter-agency consultation, and public involvement and outreach programs.

OBEC built our reputation on our ability to provide complete, project-specific engineering solutions of high value, from design through construction administration, inspection and oversight. Our professional obligation to the public, a deep commitment to our clients, our credibility with construction contractors, and our skill at design and management of projects of all sizes and complexity, have been the foundation of our professional practice.

Environmental Permitting Services

OBEC has a team of dedicated environmental permitting staff that work directly with our engineers to ensure project requirements and permit needs are well coordinated and thoroughly incorporated into the final contract documents. Guiding the OBEC project team toward solutions that minimize environmental impacts while maximizing the potential for natural resource enhancement is essential for successful environmental results on our projects. This approach has become a critical element of project success in the increasingly stringent environmental permitting climate in Oregon. Compliance with the Endangered Species Act and protection of wetlands, riparian areas and other sensitive natural areas is essential to successful permit acquisition. Project designs must also be sensitive to the environment, both in terms of aesthetics and how the project adapts within the landscape and community context, as well as project sustainability relative to energy, recycling and construction materials.

Survey/Geomatics Services

OBEC has provided surveying services to public and private clients throughout the Northwest since 1967. Our highly trained and experienced staff utilizes state-of-the-art surveying technology, software, and innovative procedures that enhance efficiency and accuracy. As a result, we provide our clients with the best possible survey products on time and within budget. OBEC's Survey Group makes use of the latest Global Navigation Satellite System consisting of Trimble dual frequency receivers, portable Global Positioning System (GPS) base station trailers, and a permanent Continuously Operating Reference Station (CORS). OBEC personnel are skilled at performing fast static, real-time kinematic, and differential GPS measurements for survey, resource, and mapping grade positioning. For conventional surveys OBEC uses Trimble Robotic Total Stations with data collectors and Trimble DiNi digital levels.

Civil/Roadway Engineering Services

Technical leadership for the design and construction of new civil and roadway projects including reconstruction, rehabilitation, and enhancement of public infrastructure and transportation facilities has been a key service sector for OBEC since 1966. Beyond design and construction of lane width, curb, gutter, sidewalks, retaining walls, new storm sewers and storm sewer detention/water

quality facilities, most of our urban and city infrastructure projects have key traffic calming, pedestrian crossing, and landscape design issues to resolve. Our accomplished design staff is thoroughly familiar with ODOT and AASHTO geometric design standards, and their extensive experience in all aspects of road and infrastructure design and construction requirements, as well as construction staging and traffic control, provide the economical and constructable civil engineering solutions our clients seek.

Construction Engineering Services

The firm's construction engineering group is dedicated to performing a full-range of field services through all phases of construction. OBEC's competence in construction oversight, quality control, materials testing, and precast inspections are attributes our clients depend upon and appreciate. Our skill and diligence at administering change orders and price agreements, wage certifications, periodic estimates and reports, quantity verification, and providing liaison with the owner and collaboration with government agencies are integrated construction management services provided by OBEC for a truly satisfactory end product. Our proactive and responsive attention to construction-related issues contributes significantly to our clients' satisfaction and has led to our excellent reputation throughout the construction industry.

Foundation Engineering, Inc.
Wastewater Treatment Plant, Lift Station and Sanitary Sewer Project Experience
Prepared for MSA for Jasper Trunk Sewer RFP

FIRM PROFILE

Foundation Engineering, Inc. (FEI) is an Oregon-based geotechnical consulting firm providing services to Pacific Northwest clients since 1982. We have offices in both Corvallis and the Portland area (Beaverton). Our staff includes 6 geotechnical engineers, two with Ph.D. degrees in geotechnical engineering, a certified engineering geologist, 4 geotechnical staff and administrative personnel. Our firm performs geotechnical investigations for a variety of projects including wastewater treatment plants, lift stations, sewer lines, directional bores, buildings, industrial and municipal treatment lagoons, industrial facilities, reservoirs, retaining walls, earth embankments, and infrastructure.

WASTEWATER EXPERIENCE

FEI has been involved in 80 wastewater projects throughout the Northwest and as far away as American Samoa. Our experience includes site reconnaissance and siting studies, subsurface exploration, geotechnical investigations, site-specific seismic hazard studies, installation, monitoring and analysis of instrumentation, utility tunneling studies, and construction observation and consultation.

Over the years, FEI has completed foundation investigations and seismic hazard studies for new wastewater treatment facilities, effluent clarifiers, SBR structures, aeration/digester basins, and control buildings, and associated earthwork and pavements. FEI is currently working on the siting and design of a new wastewater treatment facility on the Oregon coast for the Netarts-Oceanside Sanitary District, as well associated improvements at the existing plant. Selected examples of wastewater treatment projects include:

- Jefferson WWTP Expansion
- Odell WWTP Expansion
- Hubbard WWTP Expansion
- Castle Rock (WA) WWTP Rehabilitation
- Albany Biosolids Dewatering & Storage Facility
- New Netarts-Oceanside WWTP
- Shady Cove WWTP Expansion
- Silverton WWTP Expansion
- Pago Pago (Am. Samoa) WWTP Expansion
- Cottage Grove WWTP Improvements
- Toledo WWTP Expansion
- Albany Primary Clarifier
- Cowlitz Co. (WA) WWTP Expansion

Our firm has also provided geotechnical services on dozens of sewer line and pipe line projects. Recent projects include multi-year work on the West Side CSO Tunnel project for the City of Portland. For that project, FEI completed over 100 borings up to 300 feet deep, laboratory testing, geophysics studies, and ground water monitoring and investigation. FEI also provided geotechnical exploration, characterization and consultation for directional bores to install a new sewer line crossing beneath the Yaquina Bay in Newport and for a new sewer line in mountainous terrain in Netarts. Selected examples of past sewer line projects include:

- Eugene (MLK) Sanitary Sewer
- Corvallis (Grand Oaks) Sanitary Sewer
- Philomath Sewer System Improvements
- Salem (Lone Oak) Sanitary Sewer
- Portland East Side CSO
- Medford (RWRF) Reuse Pipeline
- Lebanon West Side Interceptor and Phase 2A
- Eugene (MWMC) Transmission Line
- Jackson Highway (Chehalis, WA) Sanitary Sewer
- Beaverton (Summer Creek) Sewer Relocation
- Corvallis (Philomath Blvd.) Sewer Extension
- Corvallis (Dale Street) Sanitary Sewer

Foundation Engineering, Inc.
Wastewater Treatment Plant, Lift Station and Sanitary Sewer Project Experience
Prepared for MSA for Jasper Trunk Sewer RFP

FEI has completed geotechnical investigations for over 17 lift station projects throughout the Northwest and recently completed work on a new main pump station and control building for the NOSD WWTP facility. We are currently providing construction observation of a new pump station under construction in Philomath. Selected examples of pump station experience include:

- Netarts Pump Station
- Mapleton Pump Station
- Portland (Fanno Creek) Pump Station
- Lafayette (Wilson Street) Pump Station
- Junction City (14th and Elm/9th and Ivy) Pump Stations
- Lafayette (Canyon View) Pump Station
- Eugene (Gilham) Pump Station
- Aumsville Pump Station
- Waldport (Red Ditch) Pump Station
- Portland Westside CSO Pump Station
- Corvallis (Marys River) Lift Station
- NOSD WWTP Pump Station and Control Building
- Lebanon Influent Pump Station
- Monmouth Pump Station
- Shady Cove Lift Station
- Kelso (WA) Sparks Drive Pump Station
- Portland (California) Pump Station
- NOSD Main Pump Station and Control Building

FEI has also been involved in the siting, design and construction observation for dozens of waste water-related projects and associated components such as effluent storage lagoons, control buildings, earth embankments, river crossings, landslides, cut slope stability, excavation shoring, control of ground water infiltration and mitigation of challenging site conditions such as soft or compressible soils, elevated ground water, deep fills or expansive clays.

LOCAL GEOTECHNICAL EXPERIENCE

FEI has been providing local geotechnical consulting services since 1982. James Maitland, P.E., G.E. (FEI's founder) has been working locally for over 32 years. To date, FEI has provided consultation on 195 projects in the Eugene/Springfield area and over 295 projects in Lane County. Some examples of FEI's local geotechnical experience include:

- Springfield Justice Center
- Pioneer Prkwy-Hwy 126 Interchange
- Springfield EmX Line
- PeaceHealth RiverBend Hospital
- PeaceHealth Medical Buildings
- Springfield Motor Pool
- Sacred Heart Hospital Facilities
- MWMC Transmission Line
- Springfield Transit Station
- Pioneer Prkwy Bridge Widening
- I-5 Flyover Structure
- Fire Stations (1, 2, 6 and 11)
- EWEB Operations Building
- EWEB Willamette Substation

KEY STAFF

FEI proposes to assign Dave Running, P.E., G.E. as the project manager for the Jasper Trunk Sewer project. He would be assisted by Jon Huffman, P.E. Brooke Running, C.E.G. would provide assistance with site reconnaissance and geology. James Maitland, P.E., G.E. would provide senior- level peer review and QA/QC.

Last update: 6/08/09

UNIVERSAL FIELD SERVICES, INC.
NW Regional Office – Salem, OR

Universal Field Services, Inc. (UFS) is the largest and most successful coordinated land and right-of-way services company in the nation and region. Our commitment to quality, knowledge, experience and corporate oversight brings to each project assurances of success. Although every project has a style, character and structure of its own, it must rest on a solid base of organizational skills, experienced staff and project management controls. Universal's continued success results from a thorough management work plan together with the most knowledgeable and experienced staff in the industry. Universal's project teams and commitment to quality will allow clients to proceed with confidence, knowing they have the leader in coordinated land and right-of-way services at their side.

UFS provides a full range of coordinated land and right-of-way services for governmental agencies, engineering companies, public utility companies, telecommunication companies and pipeline companies. Since 1958, these services include: project cost estimates; title investigation; relocation planning and analysis; appraisal; appraisal review; negotiations; closings; relocation assistance; utility relocation planning and coordination; route and site analysis; condemnation support; records management; and project management services. Among our past and present clients are many federal, state, and local governmental agencies. A significant amount of work for government agencies is accomplished in full conformity with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act, various Federal Agency Regulations, the Federal Highway Administration (FHWA) and State and Local requirements.

Incorporated in the State of Oklahoma, UFS is qualified to do business in forty-seven (47) states, **including the State of Oregon**. UFS's general offices are located in Tulsa, Oklahoma with additional offices in: Edmonds, Washington; **Salem, Oregon**; Oklahoma City, Oklahoma; Houston and Dallas, Texas; Athens, Georgia; Concord, Huntington Beach and Sacramento, California; Colorado Springs, Colorado; Phoenix, Arizona, Des Moines, Iowa, Tampa, Florida and Devon, Pennsylvania. In addition to the above administrative offices, Universal has project offices located throughout the United States.

The Lower Northwest Division Office is located in Salem, Oregon. This office covers the five southwest counties of Washington and the States of Oregon and Idaho. The Regional Manager, Leslie Benckendorf, SR/WA can be reached at 503-399-8002, fax number is 503-399-8003, or via email at Lbenckendorf@ufsrw.com. The office address is PO Box 2354, Salem, OR 97308-2354. More information on Universal Field Services can be accessed through the website, UFSRW.com.

"Our Mission is to provide the best land and right of way acquisition/relocation services in the Industry. Through leadership, knowledge, innovations and integrity we will ensure the best interests of our clients and employees, as well as the individuals, families and businesses impacted by right of way projects, are served."

These following projects include work similar to the proposed Jasper Trunk Sewer assignment in that they are all sewer line easement projects and were done in accordance with the Federal Uniform Act. However, none of these projects had federal funding.

Eaton Drive – City of Milwaukie, Oregon – This project for the City involved permanent and temporary construction easement from four property owners for the construction of a new sewer line along Eaton Drive. UFS obtained preliminary title reports and appraisals and made offers to the affected property owners. Easements were obtained and completed files were turned over to the City for payment.

185th Sanitary Sewer Line – Clean Water Services – UFS was responsible for obtaining permanent and temporary construction easements for this project in Tualatin the extension of an existing sewer line. There were 16 properties involved and Universal handled all of the negotiations. Several of the owners were non-english speaking owners and we had to bring in an interpreter to complete the transactions.

Cipole Road Trunk Upgrade – Clean Water Services – UFS completed all of the easements for this project for Clean Water Services. The project was to acquire 15 sewer line easements for the construction of the Cipole Trunk Upgrade project in Tualatin. This project was a combination of permanent and temporary easements in a commercial area of Tualatin. Clean Water Services provided the valuations for the easements and UFS handled all of the negotiations.

Lake Oswego Interceptor Project – City of Lake Oswego, Oregon – This project involved obtaining preliminary title reports and appraisals for six properties for the replacement of the sewer line that runs through Oswego Lake. UFS also handled the negotiations for these properties as well. There was one residential relocation involved.

Upper Drive Sewer Line Project – City of Lake Oswego, Oregon – This was a sewer line extension project for the City of Lake Oswego and involved easements from 13 properties. These easements were across the backs of these residential properties and allowed the owners to hook up to new sewer and abandon their existing septic systems, or wait until later if they preferred. UFS obtained preliminary title reports, appraisals on several properties, the City also valued some of the easements. UFS handled the negotiations for the City.

FIRM INFORMATION

Firm Name: David J. Collins Engineering (DJCE)

Firm Expertise: Hydraulic and Hydrologic Computer Modeling Software
Address: 1344 SE Clatsop Street
Portland Oregon 97202

Phone: 503.236.8190
Email: djceng@teleport.com

David J. Collins Engineering (DJCE), a sole proprietorship, is an independent consulting firm specializing in hydraulic and hydrologic computer modeling software. Established in 2000, David Collins, P.E., founder and sole employee, brings 10 years of expertise to the firm and is dedicated to providing high-quality services to the firm's clients. David worked previously with CH2MHILL.

David is currently working with the City of Portland Bureau of Environmental Services modeling group to implement an automated process that links to the City's GIS to create a hydraulic and hydrologic model in either XP-SWMM, EPA-SWMM, or DHI Mouse.

DJCE has completed major computerized system analyses for the major municipalities and private corporations listed below:

- City of Portland - Bureau of Environmental Services, Oregon
- City of Eugene, Oregon
- City of The Dalles, Oregon
- City of Tualatin, Oregon
- Potlatch Poplar Project, Boardman, Oregon
- City and County of Honolulu, Hawaii
- Department of Land Use and Transportation, Washington County, Oregon
- Oregon Department of Transportation, Clackamas County, Oregon
- The Nature Conservancy, Lake County, Oregon
- Intel Corporation, Hillsboro, Oregon

Unique Qualifications

The MSA team offers unique qualifications that we believe yield top value to the City of Springfield.

Municipal Engineering Specialists -- MSA's entire business focus is in the field of municipal engineering for public agencies.

Experienced Sewer System Analysts and Planners -- MSA is a regional leader in sewer system hydraulic analysis, basin planning and master planning. Our hydraulic modelers apply expert, well-founded planning judgments as we perform the detailed analysis necessary for proper pipeline design.

Pipeline Routing Experts -- MSA has conducted detailed alternatives analysis for hundreds of miles of pipelines. We know what fatal flaws to look for and what factors are most important in recommending the best pipeline alignments. We know what trade-offs must be considered in selecting preferred alignments and final alignment selection.

Experience with Challenging Site Conditions -- MSA has successfully designed trunk sewer improvements in the most challenging conditions. Our engineers are experienced with the special design features required to address all challenges expected from this project. This experience includes deep sewers, rock construction, railroad, wetland and creek crossings, work in highly confined corridors, trenchless technologies (boring and tunneling) and so forth. We will make certain that project designs are constructible at economical cost with minimal risk of construction problems and contractor claims.

Sound Designs -- MSA is known for developing well thought-out designs that perform both in the short term and in the long term with minimal operational complications, efficiently serving intended neighborhoods at the lowest life-cycle cost.

Familiarity with Local Conditions and City Expectations -- The MSA team is familiar with local area conditions though our prior sewer work for the City and other Willamette Valley communities. We are experienced with the City's expectations and we will deliver on those expectations.

Accelerated Work Programming -- MSA is well known for our fast-track production capabilities. We tirelessly live by our "can-do" attitude and are often hired because our clients trust that we are the only firm that can truly fulfill a promise to get their project done on time.

Graphic Illustrations -- MSA applies the most advanced analytical modeling, computer illustration and GIS mapping tools available. We have developed graphic illustration capabilities that are unmatched. Our plan maps and system illustrations are visually pleasing, highly informative and often are instrumental in our ability to "sell" our ideas to our public agency clients, public policy makers and affected citizenry.

Public Involvement -- The MSA team offers extensive experience with public involvement programs of all types. We have facilitated numerous low-key, "open-house" informational style public information forums. We have developed exhibits, slide shows and led numerous

"workshop"-type presentations for public officials where the general public was invited to participate. We have presented numerous projects as part of formal public hearing processes. The form that a particular public involvement program may take for a given assignment is often guided by the style of the managing public agency. MSA often advises on public involvement interests and assists our clients in carrying out the type of public information programming that is judged to best fit a project's needs.

A "Hit-the-Ground-Running" Team with a "Fresh Look" Perspective -- The MSA team's familiarity with the local project area, our knowledge of the City of Springfield's wastewater system and our on-going sewer system work for the City combine to provide a "hit-the-ground-running" team. We are certain that our extensive wastewater system analysis and planning experience will enable us to quickly provide the important "fresh look" on prior planning and updated analysis that will ensure that sound long term design decisions are carried forward to the project's full success.

Permitting -- The MSA team is highly experienced with all aspects of permitting associated with public works projects. We have successfully processed conditional land use and environmental permits for all of the firm's recent sewage system projects.

Local Office -- MSA's local Springfield office brings regional engineering expertise directly to the City. This means top quality, value and immediate attention to all project needs.

Experienced Construction Managers -- As a mid-sized firm, MSA offers an impressive project record. The firm currently manages an estimated $50 million or more of construction work annually. We apply formal construction management techniques and have an excellent track record in bringing projects in on time, within budget and with nominal change orders.

Experience with Varying Operating Conditions -- MSA understands the importance of considering varying system use and operating conditions over the life of a project. Such understandings are important to sensible, effectual design.

Project Management

Project Management Philosophy -- MSA basic project management philosophy is to deliver projects on time and within budget, noting that the budget is our responsibility, not our client's, when we have committed to a particular work program for a given fee. We make sure that we are spending our greatest energies on the most important aspects of the job, keeping broad project goals in mind as we complete fine project details. We work hard to identify approaches, concepts and designs that meet project objectives (short- and long-term) at the lowest life-cycle cost. We know that the art to fine design is simplicity. Successful management of a public works project is based on careful planning and organizing that begin at project start-up and carry through to construction completion.

Project Management Approach -- At MSA, we constantly coach our staff to make sure we are appropriately understanding and responding to our client's fundamental values. We know that our clients have choices about who they hire. We work very hard in all of our personal interactions and in our firm conduct to be the type of people and organization with which our clients want to work. *Our basic goal is very simple...satisfied clients! We do this by:*

• *Understanding our client needs and delivering on those needs* • *Providing prompt, efficient, responsive service through competent, energetic, courteous and professional staff* • *Delivering high quality work products that are visually pleasing and easy to understand* • *Understanding that communication is more listening than talking* • *Religiously honoring commitments on cost, deliverables and schedules* • *Respecting that* ***"the customer is always right"***.

Contract Administration/Management Plan -- MSA establishes a detailed work plan as an important first step for a successful management plan. The work plan includes: 1) the agreed scope of work; 2) a schedule with milestones and key dates; and 3) a budget by work task. The client and all team members receive a copy of these documents plus any updates due to changes during the course of the project. These three documents are used by MSA to monitor progress, schedule meetings and submittal due dates, and make requests for payments. The plan also includes items such as project organization, reporting, accounting and record keeping procedures, and quality assurance and quality control.

Quality Assurance -- MSA achieves a high-quality work product through involvement of experienced principals in all of the firm's projects. The firm is a private corporation owned by the principals and associates of the firm who must also be full-time employees of the firm. The firm is managed by its seven senior principals, eight principal engineers, and five associates, each responsible for certain aspects of the business operation. All of the firm's principals are practicing engineers and all are extensively involved in project management and day-to-day engineering work. As a matter of policy, a principal must be involved in every project, regardless of size. We believe that this high level of attention to each project by a senior principal engineer has been one of the major keys to the firm's success and growth. This involvement continues throughout the project. The responsible principal conducts periodic internal reviews to ensure that the project is being executed at the highest quality level.

Documentation System -- Documentation of our work is very important. This is achieved by use of technical memoranda, meeting minutes, telephone records, design calculation files and other written documentation of our work. This information is forwarded to our clients to be sure that they are apprised of the project activities and status at all times. MSA reviews and critiques all work products submitted by its subconsultants prior to incorporating these into our work products. Our reputation and the quality of the final work products are directly dependent on the caliber of information we receive from our teaming partners. As such, we carefully select our team to be composed of the highest level of professionals available in their respective areas of expertise.

Project Records -- MSA maintains detailed project records throughout the course of all projects. Elements of this project documentation system are listed below:

- Phone records
- Files Memos
- Email records
- Meeting memos
- Meeting agendas
- Letter correspondence
- Technical Memoranda
- Daily Observation Reports
- Contract Submittals
- Project Photos
- Request for Information
- Monthly progress reports

Clear, concise documentation allows decisions to be made quickly and provides for documented agreement on the future direction of the project. All communications (by telephone and in meetings) in which significant project information is exchanged are documented. A master communication file is maintained. No information is disseminated to third parties without prior approval of the client.

For major improvement projects, MSA produces project-specific, monthly construction progress reports documenting the status of construction, comparing contract value earned to elapsed contract time and tracking construction issues that have the potential of becoming change orders.

Scheduling Software -- MSA has used MS Project scheduling software since 1996. We have used this software as an integral part of practically every one of the hundreds of projects that we have completed since that time. It is initially developed as part of proposed work programming and is then used through the life of the project to help achieve the milestones and submittal dates that we have committed to. The schedule is updated as project work progresses and provided for review as part of ongoing project management.

Work Schedules -- MSA takes project schedule and project delivery commitments very seriously. Our project teams routinely do what it takes to get the job done. If something has happened outside of our control that we know will cause delivery schedules to slip, we promptly apprise our clients of such circumstances and develop mutually accepted schedule updates.

Project Monitoring and Cost Control -- MSA is known for our track record in completing projects on time and within budget. Once selected for a project, we work closely with our public agency clients to develop a work program (scope, cost and schedule) that best accomplishes a project's particular objectives. MSA then works diligently to complete assigned work within established commitments of completion time and cost. We have a reputation for doing whatever it takes to get the job done and for strictly honoring commitments on cost. This reputation is validated by the large volume of repeat work that we do for public agency clients and is easily verified by contacting any of our many public agency clients. Our office has a fully automated project accounting system that reports budget status of all projects bi-weekly. This information allows project managers to confirm work progress relative to budgets and to make any adjustments in work programming that may be required to keep project work on-track. The project is monitored monthly. Actual expenses are compared to the budget and actual progress is compared to the schedule. MSA submits a status report on these comparisons to the client as part of the monthly invoice. These comparisons indicate if the team needs to adjust its work to perform on time and within budget. Any budget or schedule adjustments required by changes in scope are discussed and authorized by the client prior to proceeding with the work.

Staff and Subconsultant Management -- MSA's project manager conducts management of the project staff and subconsultants. Periodic internal project reviews are conducted to confirm that the project is following the project management plan. MSA maintains contact with its subconsultants through telephone and email communications, as well as through personal contacts and meetings in the field or office. The frequency is dictated by the requirements and complexities of each specific project, but MSA maintains at least weekly, if not daily, contact with each subconsultant when they are actively involved in any given phase of a project. MSA requires all subconsultants to execute a written contract with our firm that incorporates the agreement between the Owner and MSA.

Quality Control Approach and Results -- At MSA, we know that good quality assurance (QA) and quality control (QC) begin with good project management and active senior principal involvement in all projects. MSA's mission is to do our job extremely well with proper internal quality assurance measured so that the client's "quality control" role is one of confirming our good work on our client's behalf rather than demanding the client act as a "hammer" to force acceptable service delivery.

Value Engineering -- Value engineering is performed throughout the design process. Value engineering is the analysis of the functional requirements of the system to achieve the essential functions at the lowest life-cycle cost, consistent with performance, reliability, quality, maintainability, long-term operations and other factors. Value engineering is performed by MSA as a matter of course during design and is also performed during formal QA/QC reviews.

Philosophy on Construction Phase Services -- MSA believes that it is important for the design engineer to take an active role in the construction phase of the project. Where a public agency client may have internal resources to dedicate to project construction activities, MSA works closely with the client to develop a partnering work program that ensures that all aspects of the work are properly managed and overseen. Our goal is to provide the optimal value of our services in the delivery of a constructed project to meet the project's long-term operational and performance objectives at expected and agreed costs, all with minimal exposure to expensive and disruptive contractor claims.

MSA believes we can best achieve our firm's maximum offered value by taking on the lead role in construction contract administration, field observation and construction management. These are the roles we are most often asked to provide by our many public agency clients. MSA has developed standardized procedures that are systematically proven out in the field and constantly updated to reflect changes in state public contracting law, regional trends in the construction industry and other guidance offered by the professional liability insurance carrier. Our technical specifications follow protocols, guidance and formats established by the nationally accepted Construction Standards Institute (CSI). Our contract documents follow standardized protocols, guidance and formats established by the Engineers Joint Contract Documents Committee (EJCDC). Contract document provisions are systematically reviewed with our client representatives and our client's legal counsel, with appropriate provisions being incorporated that reflect each particular public agency's specific policies, practices and/or adopted ordinances.

MSA's practice is to assign engineering personnel that have been involved in the subject project's design to oversee project construction. In this way, we provide important continuity and avoid the potential conflicts that can develop through misinterpretation of contract documents and design provisions or intents. Our field engineering personnel are trained in proper professional conduct and the use of MSA's standard construction administration monitoring and reporting forms and protocols. MSA's field engineering staff ensures that all construction, testing and project start-up procedures are conducted in accordance with specified requirements and standards and other project interests.

As is customary in the industry, MSA's contract documents normally include contract provisions for project start-up and testing to be completed by the construction contractor in coordination with the Owner and with the oversight of the engineer. With MSA's active involvement, any

problems that might occur are immediately assessed and appropriate responses are promptly programmed.

Liaison and Communications with the City of Springfield -- MSA plans to meet frequently with the City throughout the course of project work to report on the status of the project, share ideas among City staff and the project team, and present interim findings and conclusions. Agenda items and materials will be distributed in advance of meetings so that the meetings will be as productive as possible. MSA distributes minutes after each meeting and conducts necessary follow-up activities.

Project Outcomes -- MSA places the highest priority on achieving positive project outcomes. While each particular project is likely to have its own unique measure of "project success", the universal standard of measure is ultimately the satisfaction of the client. For public works projects, "the client" is often not a single individual, but an integrated collective of interests, including field operations staff, who must operate the particular facility throughout its intended service life; agency management staff who must carry the immediate agency responsibility for a project's success; policy leaders (elected or appointed officials) who must answer to the served public; and, of course, the served community itself. At MSA, we understand the importance of achieving project success at all levels. We are known for delivering high-value public works projects that respect the ever-present financial constraints that confine and guide public works expenditures, projects that properly and efficiently perform the intended purpose while delivering long-life service and optimal life-cycle cost/benefit, appropriately reflecting the values of the local community. We work hard to make sure that:

A. *The project meets and exceeds basic performance objectives;*
B. *The project is constructed within anticipated budgets;*
C. *The project is constructed on time;*
D. *The project is operationally sound;*
E. *The project is aesthetically pleasing and is compatible with its surroundings;*
F. *The project is affordable;*
G. *Permitting programs (land use, environmental, special use) are properly strategized and orchestrated for successful approval;*
H. *The public is generally accepting of the project;*
I. *Unavoidable impacts to the immediate community are minimized and appropriately mitigated;*
J. *The project meets immediate service needs and offers a long service life;*
K. *The project was not unduly burdened by unexpected construction claims that could be blamed on project engineering;*
L. *The client's experience with MSA staff and the firm was pleasurable throughout the course of the project;*
M. *The client is inspired to invite MSA back for follow-up work.*

For any given project, there are a myriad of challenges and issues to be addressed. At the start of every assignment, MSA strives to confirm with our client the various success factors that are driving the project and all of the challenges and issues that will have to be effectively addressed and resolved for the project to be a demonstrated success. Meeting these challenges and issues is key to the successful completion of the project.

Outlined below is a brief discussion of MSA's approach to achieving each of the above-noted success factors.

A. The project meets and exceeds basic performance objectives.

The most important aspect of this success factor is defining what the performance objectives of a project are with our client. This is typically accomplished through completion of a preliminary engineering report, predesign report, concept design report or a project scoping report that develops in a very detailed manner the project's intent and performance requirements. Agreement by the client and MSA on the project details through such a process then guides the project for final design and construction, thus assuring that the basic performance objectives of the project are met.

B. The project is constructed within anticipated budgets.

MSA develops cost estimates for all projects at various phases of the project process. This estimating starts at the planning or conceptual level and continues through preliminary and final design. We know that nobody likes surprises in project costs and we work diligently throughout the planning and design process to keep our client project managers informed of anticipated project costs. Where design modifications may be possible and/or necessary to reduce costs, we review and present practicable cost-reducing measures. Further, we are diligent about identifying potential cost concerns early on in the construction process at a stage when revisions may be made at the least overall impediment to the project.

C. The project is constructed on time.

MSA develops an initial project schedule during the planning or conceptual phase of the project and periodically updates the schedule. Through MSA's prior experience on similar work, an initial realistic schedule is developed considering the project specifics, including site acquisition, land use approvals, environmental and other permits, and other factors that may impact the schedule. MSA then seeks to maintain the schedule through construction and project startup. An accelerated design process, as well as accelerated equipment and materials procurement, construction contractor selection and contractor incentives for early completion, can be used to assure on time project delivery.

D. The project is operationally sound.

MSA has an extensive experience record with the planning and design of all aspects of water, wastewater and stormwater systems. Through this experience, our staff will work with the City's engineering and operation and maintenance staff to assure that the project is operationally sound, i.e. that it meets the defined operational objectives and requirements. We strongly encourage the participation of our clients' operations and maintenance staff in projects from the beginning. Their input into the design process is invaluable as these individuals will have the ongoing responsibility for the facility's operational success after construction is completed. Their "buy-in" to the design is essential to the facility's long-term success.

E. The project is aesthetically pleasing and is compatible with its surroundings.

MSA is very proud of our public facility designs with respect to their aesthetic appearance. We always make a special effort to assure that our clients' structures are compatible with neighborhood surroundings. Landscaping and site treatments are often essential to developing a compatible facility. Noise attenuation is included for mechanical systems; above-grade structures are designed for minimal site impedance.

F. The project is affordable.

Project affordability starts at the planning phase: being sure that the project planning evaluates all the alternatives; that all costs, including first costs (capital costs) and ongoing operations and maintenance costs over the life of the facility, are included in the alternative evaluations; and that the alternative selected for implementation meets all of the project objectives and is affordable considering the client's financial capacity and established budgets.

G. Permitting programs (land use, environmental, special use) are properly strategized and orchestrated for successful approval.

As part of an overall work program on certain projects, permitting program costs can cost as much or more than final design costs. Often, small changes in design concepts can save thousands of dollars in overall project costs. MSA takes a holistic view of every project to make certain that permitting interests are considered at every stage in the project. Where a project may easily avoid potentially sensitive areas, and thus eliminate expensive permitting and/or mitigation costs, MSA does this. Where impacts are unavoidable, MSA works with the client, regulators and other stakeholders to develop mitigation that results in meaningful win-win results. When permitting sensitivities are apparent, MSA promptly informs the client and reviews various strategies. Because permitting and mitigation requirements can occasionally be subjective and personality-driven, MSA works to ensure that lead personnel are assigned to a given agency contact that may have the highest chance of constructive interaction with regulatory counterparts for positive results. MSA is known for carrying out successful permitting strategies on a wide range of complicated projects.

H. The public is generally accepting of the project.

Public acceptance of a project is essential to its success. Typically, public acceptance is governed by the project neighbors who will be the most impacted and thus the most vocal about the project. MSA has found in its prior work that development of aesthetically pleasing designs that are compatible with the facility's surroundings coupled with a public information program is very effective at gaining public acceptance. We have effectively utilized a neighborhood meeting format in a team effort with our clients to present proposed projects to the affected public. We attend these meetings with illustrations of the proposed facility such as site photos with the facility superimposed or professionally prepared conceptual renderings. Key MSA engineers represent the firm so that all questions can be answered authoritatively and accurately. This approach can be very effective in gaining public input and diffusing opposition to the project, allowing issues broached during the process to be incorporated into the design, further improving public acceptance of the project.

I. Unavoidable impacts to the immediate community are minimized and appropriately mitigated;

Certain projects, because of their nature, will impact the immediate community, either in the short term, during construction, or for the long term, as the project is completed for the intended purpose. Such impacts can create high emotion and apparent personal hardship. Because our firm specializes in "community engineering", we are constantly attentive to such impacts. We work collaboratively with our public agency clients to make sure that project designs and the constructed project are as minimally impacting as possible while accomplishing the project's basic objectives. Where possible, we work to identify mitigation opportunities that may create win-wins for both the community at large that is represented by our client public agency and the local community that is represented by the locally impacted neighborhood.

J. The project meets immediate service needs and offers a long service life.

As an overall design philosophy and as a standard firm practice, MSA designs for long-term value in operation, maintenance and performance of facilities. While avoiding "gold-plating", MSA pays particular attention to the specification of high-quality materials, equipment and systems to ensure that finished projects will deliver a long service life.

K. The project was not unduly burdened by unexpected construction claims that could be blamed on project engineering.

As we most often administer and manage the construction of the projects we design, we pay close attention to detail and apply quality assurance/quality control procedures and reviews throughout all phases of our design work. These procedures start at the conceptual project stage and continue through final design. While we know that all change orders cannot be avoided, we continuously strive to make certain that potential construction change orders are not the fault of engineering oversight.

L. The client's experience with MSA staff and the firm was pleasurable throughout the course of the project.

A fundamental aspect of the consulting engineering business is that it is a "people business" above all else. The key to project success is teamwork between the client, MSA and the various other project stakeholders. MSA hires engineers and other technical and administrative staff who are good communicators and who are respectful and pleasurable to deal with. Only through superior personal interactions of the project team can a truly successful project be accomplished, one that all parties to the process can be proud of.

M. The client is inspired to invite MSA back for follow-up work.

The key measure of success in the consulting engineering business is having a high percentage of repeat, follow-up work with existing clients. MSA works very hard to have satisfied clients who ask the firm to do additional work. Over 95% of our work is from repeat clients, some for whom we have worked since the firm's founding in 1980. MSA appreciates the opportunity to perform a project for a client and to be invited back to do more.

What our clients say about MSA -- Presented below are a few quotes from current/recent MSA clients that offer a further gauge of MSA's performance.

"MSA has given the job the total package: excellent engineering, professionalism and customer service. I would highly recommend MSA for any project."
– Denny Clouse, Operations Manager, Shoreline Water District, Washington

"I can recommend with confidence the firm of Murray, Smith & Associates, Inc. to approach any potential assignment with evident technical mastery and the desire to create lasting, innovative municipal work." – Neal Wallace, P.E., Public Works Director, City of Seaside, Oregon

"MSA's project team performed their work with exemplary style and in keeping with the highest standards of excellent engineering and program management. They have raised the bar of excellence for others to strive toward." – Tim Dodson, P.E., Consultant Project Manager, Oregon Department of Transportation

"We are particularly proud of the work Murray, Smith & Associates, Inc. assisted us with for the development of our drinking water (well-head) protection program. This was a national award winning effort that has been of great value to the District and is indicative of the high quality of work that Murray, Smith & Associates, Inc. always provides us. They continue to provide services to us on current work and these efforts are proving to be of outstanding caliber as well." – Tom Porkorny, Former General Manager, Powell Valley Water District, Oregon

"I cannot think of any issue [MSA] did not respond to in a timely, professional manner. I give MSA an A+++++ on this project and this is why we want to continue working with [MSA] on Well #9. I look forward to a long relationship…" – Bob Cochran, P.E., Public Works Director, City of Fairview, Oregon

"MSA's plans have exceeded my expectation for quality and have always been delivered on time…Their staff answer questions with confidence and a clear understanding of the technical details and their effects on the overall project. Their understanding of how public agencies operate and their dedication to providing well developed work products simplify my duties and boost my confidence that the project will succeed." – Don Ranger, P.E., Project Engineer, City of Bothell Public Works Department, Washington

"[MSA] staff are very responsive, and trouble shoot problems the moment they come up." – Scott Lazenby, City Manager, City of Sandy, Oregon

"I have had the opportunity to work closely with [MSA] principals, project managers, project engineers, and staff engineers and have been delighted with and very well professionally served by all. They are a pleasure to work with and go out of their way to make sure everything they do is done with care, thought, prudent engineering judgment, client cost sensitivity and professional integrity." – Guy Johnson, Project Leader, Oregon Department of Transportation

Recent Message Related to MSA's Current Sewage System Engineering Work for the City of Springfield:

"Thanks for taking the time and keeping an open mind about the qualifications for the Marcola Interceptor CIPP project. It looks like your efforts paid off based on the bid results. I believe you saved the City of Springfield a substantial amount of money by PIPEnology being a qualified bidder. Insituform obviously knows our group is incredibly experienced in these larger diameters and knew we'd plan it and price it aggressively. You guys could've taken the easy way out on the qualifications resulting in just two bids. Instead, you took the time and expended the energy to review our company and individual experience allowing you to place logical parameters on the contractor qualifications. Congrats on doing a great service for your client and saving them several thousand dollars." – Joe Feuerborn, Vice President/General Manager, PIPEnology, Inc.

Perspective -- MSA is known for our delivery of high value to our public agency clients. Because we serve many communities as City Engineer or District Engineer, we know how important it is in public facilities planning and design to work closely with our clients to make sure we understand the essential needs of a particular project so that budgets can be established accordingly. We know that nobody likes surprises in project cost and we work diligently throughout the design process to keep our client project managers informed. Where design modifications may be possible and/or necessary to reduce costs, we review and present practicable cost-reducing measures with our client team counterparts. We identify potential cost concerns early on in the design process at a stage when revisions may be made at the least overall impact to the project.

MSA Quality Management Program

Outlined below is a summary of MSA's current Quality Management Program.

MSA QUALITY MANAGEMENT PROGRAM SUMMARY

- *Effective QA/QC begins with good project management*
- *Project team – MSA assigns experienced and capable engineers, technical experts, project managers and principals to each assignment*
- *Project management plan – every project is guided by a project management plan*
  - *Definition of clear project goals and objectives*
  - *Sound scope of work*
  - *Agreed project budget and task-by-task fee breakdown*
  - *Project schedule that meets required milestones and delivery dates*
- *Project documentation*
  - *Organized filing systems*
  - *Complete correspondence/communication records – e-mails, faxes, transmittals, phone memos, meeting memos, letters, technical memoranda, reports, documents*
  - *Retrievable design files*
- *Design team collaboration*
- *Use of special technical experts and peer reviewers*
- *Application of accepted industry standards and practices*

- *Periodic/routine client reviews*
- *Principal level QA/QC reviews*
- *Extension of design team as key construction administration/construction management team*
- *Daily field engineering observation*
- *Special inspections – in-house capabilities and third party experts*
- *Application of industry standard testing protocols*
- *Enforcement of construction contract documents to achieve desired construction quality*
- *Establishment of quality expectations early*
- *Rejection of substandard or poor quality work*
- *Final inspection*
- *Engineering review of project start-up and testing*
- *One-year and two-year warranty inspections*

Proven Track Record of Delivery

As a part of our invoicing process, MSA updates clients monthly as to the status of the project schedule and budget. On fast-track and/or more complex projects, we will utilize status updates made twice monthly to weekly of both schedule and budget using our in-house accounting and project management software.

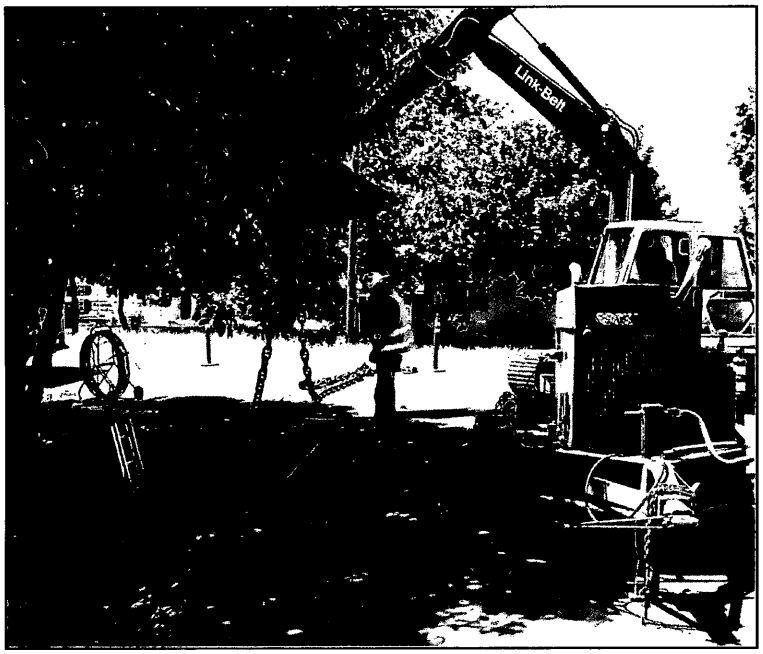
MSA is fully committed to meeting tight project schedules with confidence. Our team's recent successful performance on many fast-track projects demonstrates our ability to meet demanding schedules. Our firm prides itself in the ability to fulfill our clients' needs both with respect to expertise and in providing timely and professional responses. Our depth of staff and team approach to client service allow us to respond immediately to pressing needs as they develop.

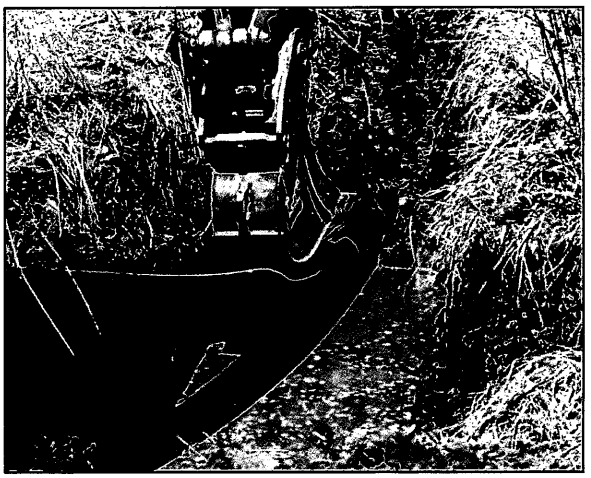
Project Examples

Following are illustrative project descriptions for current and recent key projects that demonstrate MSA's qualifications and capabilities relative to the contemplated City of Springfield work.

MSA

Example Projects

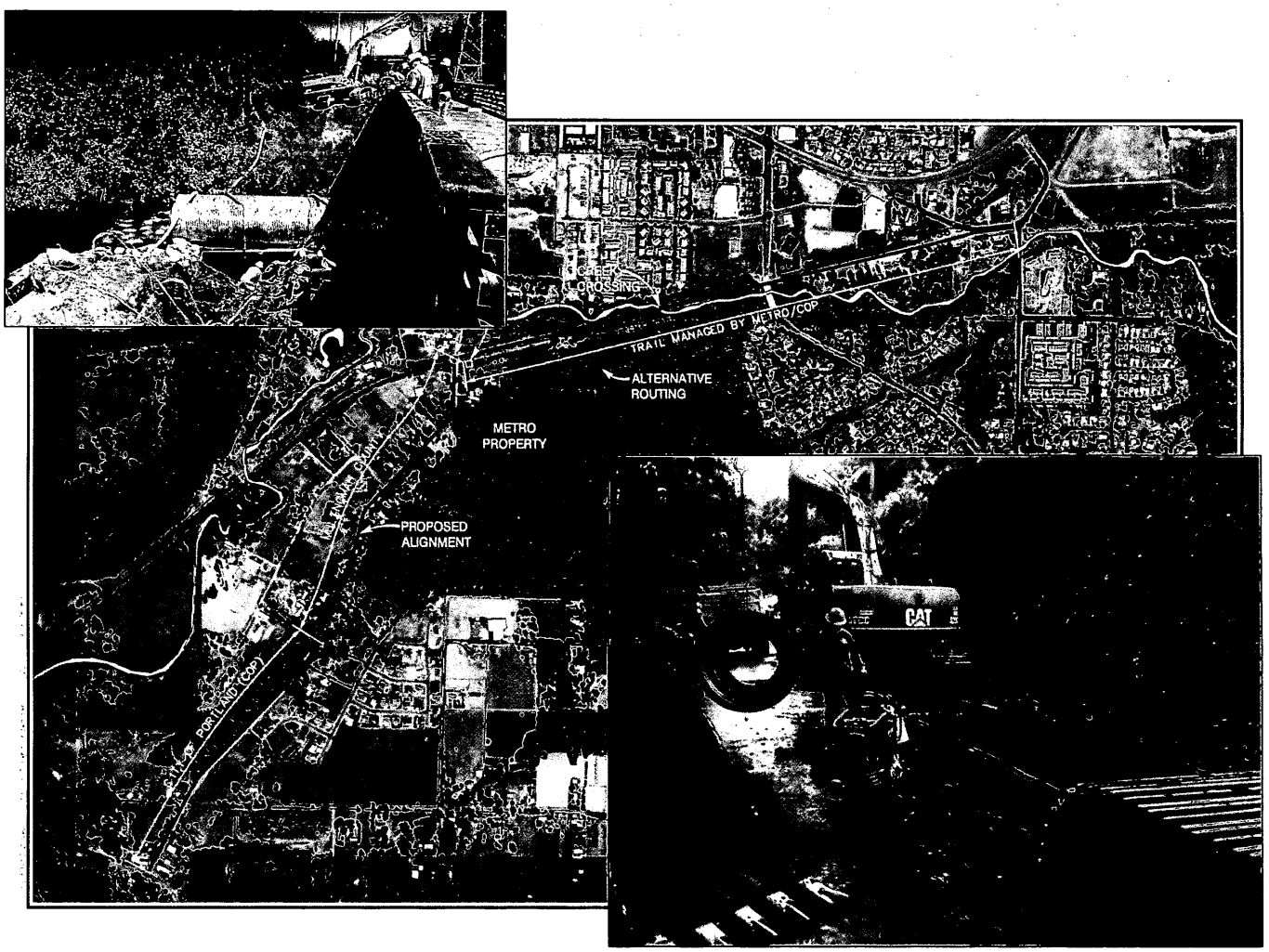




Project: Sanitary Sewer Rehabilitation
Owner: City of Springfield, Oregon
Contact: Paul von Rotz, P.E., Civil Engineer, 541.736.1017
Project Cost: $9,000,000
Current Project

Description:

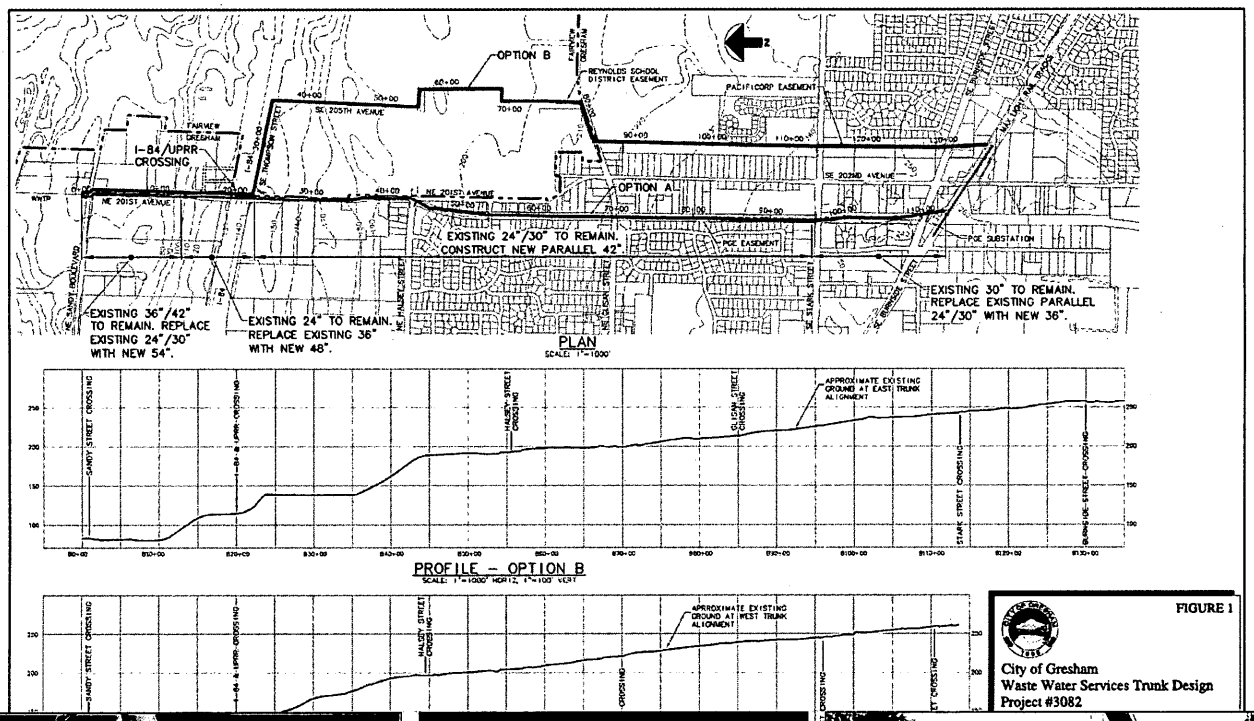
MSA was retained by the City of Springfield, Oregon, to plan, design and provide construction management services for a $9 million sanitary sewer system rehabilitation program. The sewer rehabilitation program is being undertaken on a fast-track basis in order to comply with a regulatory deadline of construction completion by December 31, 2009. The project consists of rehabilitation and/or replacement of approximately 35,000 feet of 8-inch to 15-inch diameter mains and associated manholes and service laterals. Many of these mains are located in older sections of the City where there is substantial infiltration through deteriorated sewers. A significant portion of the mains are located on back lot lines on narrow easements, necessitating strict requirements on the construction contractors with respect to construction activities on private properties. MSA is developing a rehabilitation program to cost-effectively reduce the significant infiltration and inflow in these mains. A contracting strategy incorporating multiple construction contracts is being developed as part of the program to maximize the ability of local construction contractors to participate. The project also includes the rehabilitation of a 3,000-foot long section of 42-inch diameter interceptor sewer. The deficiencies in this trunk main were evaluated against a replacement alternative on a new route and rehabilitation was selected as the most cost-effective solution.

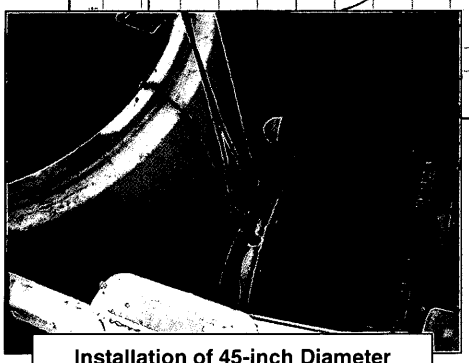


Project: Jenne Road – Pleasant Valley Interceptor
Owner: City of Gresham
Contact: Jim Montgomery, Senior Engineer, 503.618.2437
Project Cost: $3,000,000
Project Completed

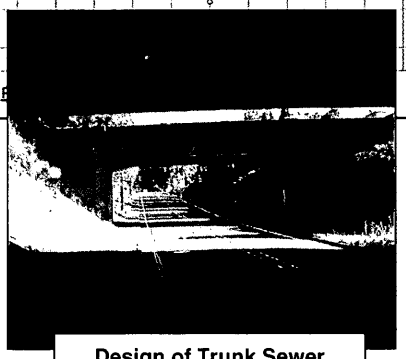
Description:

MSA performed permit application and design services for the City of Gresham, Jenne Road – Pleasant Valley Interceptor Sewer project. MSA prepared permit applications for the Corps of Engineers/DSL 404 wetland permit, NOAAA fisheries permit and the City of Gresham Water Quality Resource Area (WQRA) permit for the creek crossing work in the wetlands and along the proposed pipeline alignment. In addition, MSA assisted the City with the City of Portland Parks Bureau permit for work in Springwater Trail Linear Park. MSA's work also consisted of preparing traffic control and detour plan development for closure of SE Jenne Road to submit to City of Portland and Multnomah County transportation departments for approval. Design work involved assisting the City with interceptor design and completing design for the inverted sewer crossing of Johnson Creek. Pipes were sized to accommodate build-out flows in the Pleasant Valley Area based on MSA's Kelly Creek Trunk Sewer Feasibility Evaluation (which included hydraulic and routing analyses). Design challenges for the 9,500-foot long, 24- to 36-inch diameter trunk sewer included sewer piping up to 20 feet deep in SE Jenne Road and coordination with various agencies related to conflicts with existing utilities.

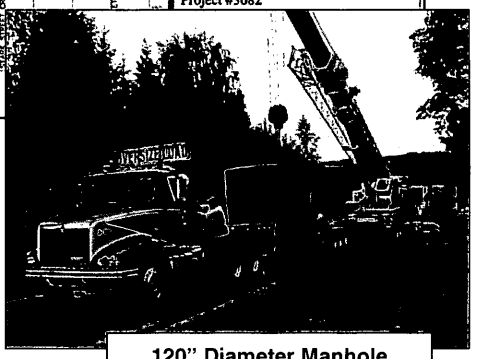




Installation of 45-inch Diameter Piping and 96-inch Diameter Manhole



Design of Trunk Sewer Through Narrow and Congested Utility Corridor



120" Diameter Manhole Installation

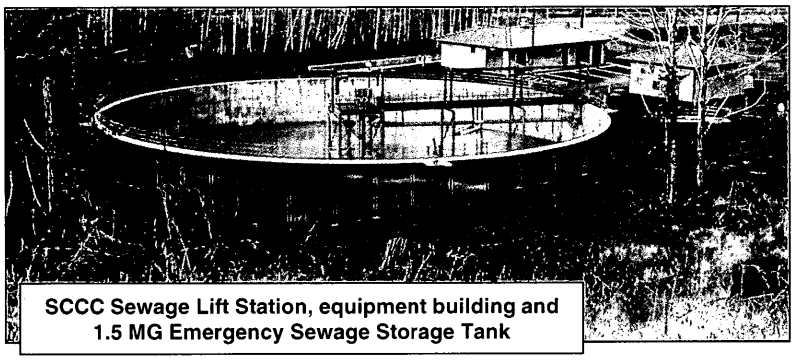
Project: Wastewater Trunk Sewer Improvements – Phase 1
Owner: City of Gresham
Contact: Jim Montgomery, Senior Engineer, 503.618.2437
Project Cost: $6,000,000
Project Completed

Description:
MSA completed evaluations and designs to increase the capacity of the City's sanitary sewer trunk system. Engineering work included a sewer trunk route alternative analysis, sewage trunk capacity SWMM modeling, and analysis and design of the City's primary gravity trunk sewer to the Gresham Wastewater Treatment Plant. The route analysis included evaluation of various alignments through congested corridors based on cost and ability to relieve existing portions of the sewage system where surcharging had been observed or anticipated based on modeling results. The project involved 12,000 feet of 36-inch to 54-inch diameter reinforced concrete gravity sewer upgrades, flow diversion structures, permitting with multiple jurisdictions, coordination with other utilities, easement acquisitions and a connection to the existing wastewater treatment plant. MSA also completed a feasibility study for serving the City's Linneman Sewer Basin through a gravity tunnel as an alternative to expanding the Linneman Pump Station capacity.

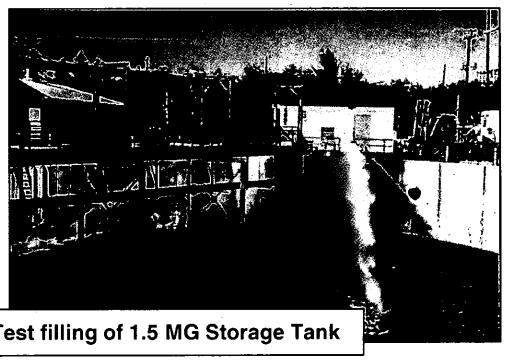
Project: Sewer System Capacity Improvements "K"
(Central City Interceptor Sewer)
Client: City of Everett, Washington
Contact: Dave Voigt, Senior Engineer, 425.257.8983
Project Cost: $6,300,000
Current Project

Description:

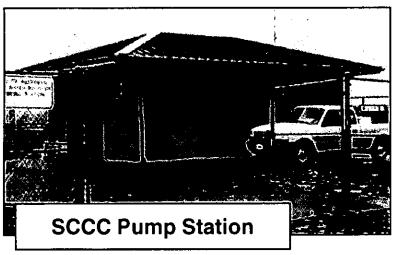
The City of Everett retained MSA to complete preliminary and final design for improvements to a portion of the City's central interceptor system located on 3rd Avenue SE, Everett Mall Way and northerly on West Mall Drive and the Interurban Trail. The City's 2006 Comprehensive Sewer Plan called for additional capacity to a section of the interceptor, approximately two miles long, by paralleling the existing sewer with a new sewer. MSA conducted an alternatives analysis to consider all potential capacity improvement alternatives in addition to the paralleling option. Through a workshop session with City staff, all alternatives were reviewed and a preferred alternative was selected. Phasing opportunities were evaluated for the preferred alternatives to consider project scheduling, deferring project costs and implementation. MSA prepared a predesign report documenting the alternatives analysis and selection process and defining the first phase of the project. MSA has completed Phase I of the Sewer "K" Improvements including 3,700 feet of 30-, 24-, and 18-inch gravity sewer, over 300 feet of trenchless installation using jack and bore technology, and extending a 20-inch force main approximately 3,100 feet. The project also involved replacement of two 42-inch culverts, stream crossing and utility coordination. MSA assisted the City with public involvement, bidding and construction services on this $4.5 million project. Construction for Phase I was successfully completed in March 2009 and MSA is currently providing a preliminary plan set for Phase II.



SCCC Sewage Lift Station, equipment building and 1.5 MG Emergency Sewage Storage Tank

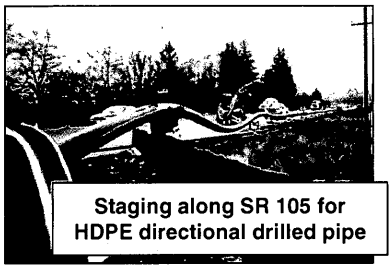


Test filling of 1.5 MG Storage Tank

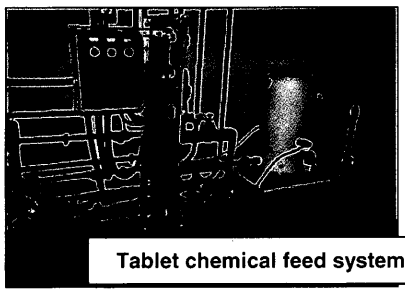


SCCC Pump Station

Chehalis River Pump Station

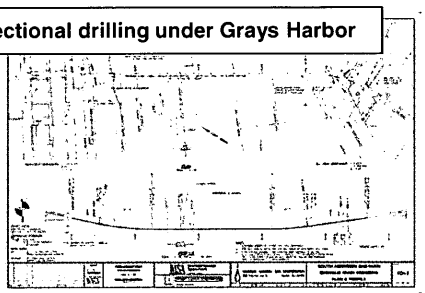


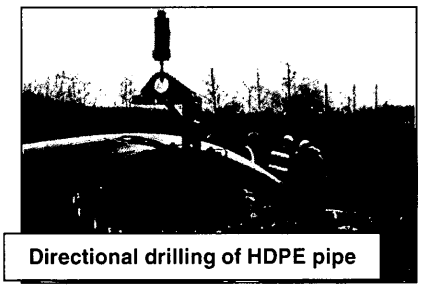
Staging along SR 105 for HDPE directional drilled pipe



Tablet chemical feed system

Directional drilling under Grays Harbor



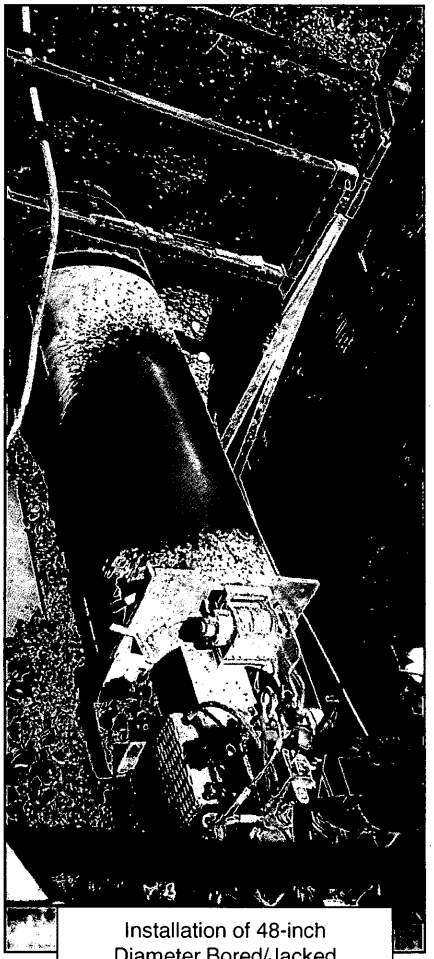


Directional drilling of HDPE pipe

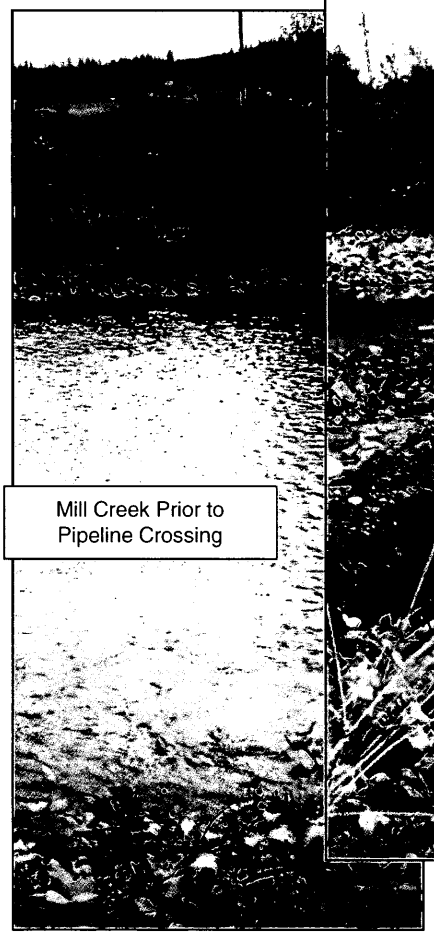
Project: Utilities Service Extension to the Washington State Department of Corrections Stafford Creek Corrections Center
Owner: City of Aberdeen
Contact: Jim Robertson, Former Director of Public Works, 360.482.3315,
Project Cost: $13,500,000
Project Completed

Description:

MSA completed facilities planning, design engineering and construction administration for extending sewer, water and natural gas service to a new 2000-bed State correctional facility, located approximately six miles southwest of the City of Aberdeen, a coastal community in Grays Harbor County, Washington. The project included capacity analyses of the City sewer and water systems and development of recommendations for system improvements to provide service to the correctional center and to undeveloped areas south of Aberdeen. Designs were completed for approximately 32,000 feet of 12-inch diameter sewage force main, approximately 30,000 feet of 10-inch and 12-inch diameter water piping, and approximately 23,000 feet of 4-inch diameter welded steel natural gas piping. Eighteen crossings under six creeks were made using directional drilling techniques. A 2,300-foot long natural gas crossing of Grays Harbor was also made using directional drilling. The design included two water pumping stations, a sewage pumping station and a 1.5-million gallon reinforced concrete emergency sewage storage tank. Rechlorination using calcium hypochlorite tablet feeder was installed. A calcium nitrate chemical feed system was installed at the sewage pumping station to control odors and corrosion in the six-mile long sewage force main. Work included complex environment permitting, regulatory compliance monitoring, and permitting with the Washington Department of Transportation for location of piping in the shoulder of a secondary State Highway. MSA's construction phase services included a formal partnering process.



Installation of 48-inch Diameter Bored/Jacked Steel Casing for Pringle Creek and Railroad Crossing



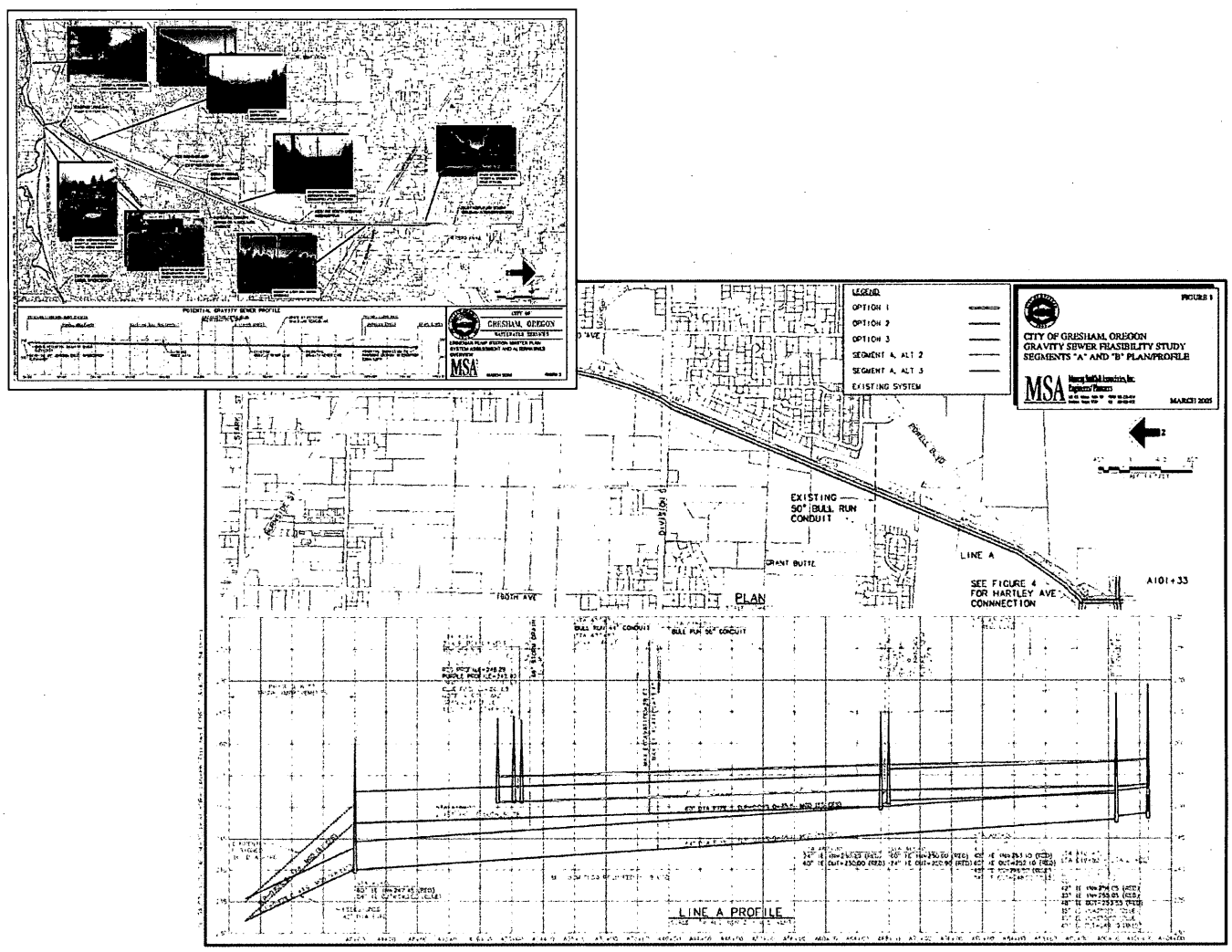
Mill Creek Prior to Pipeline Crossing

Mill Creek Open-Cut Pipeline Crossing Utilizing Cofferdam Construction

Project: OSCI Sanitary Sewer System Project, Phase 2
Owner: Oregon State Department of Corrections
Contact: Scott Young, Project Manager, 503.373.1572 x 7129
Project Cost: $1,600,000
Project Completed

Description:

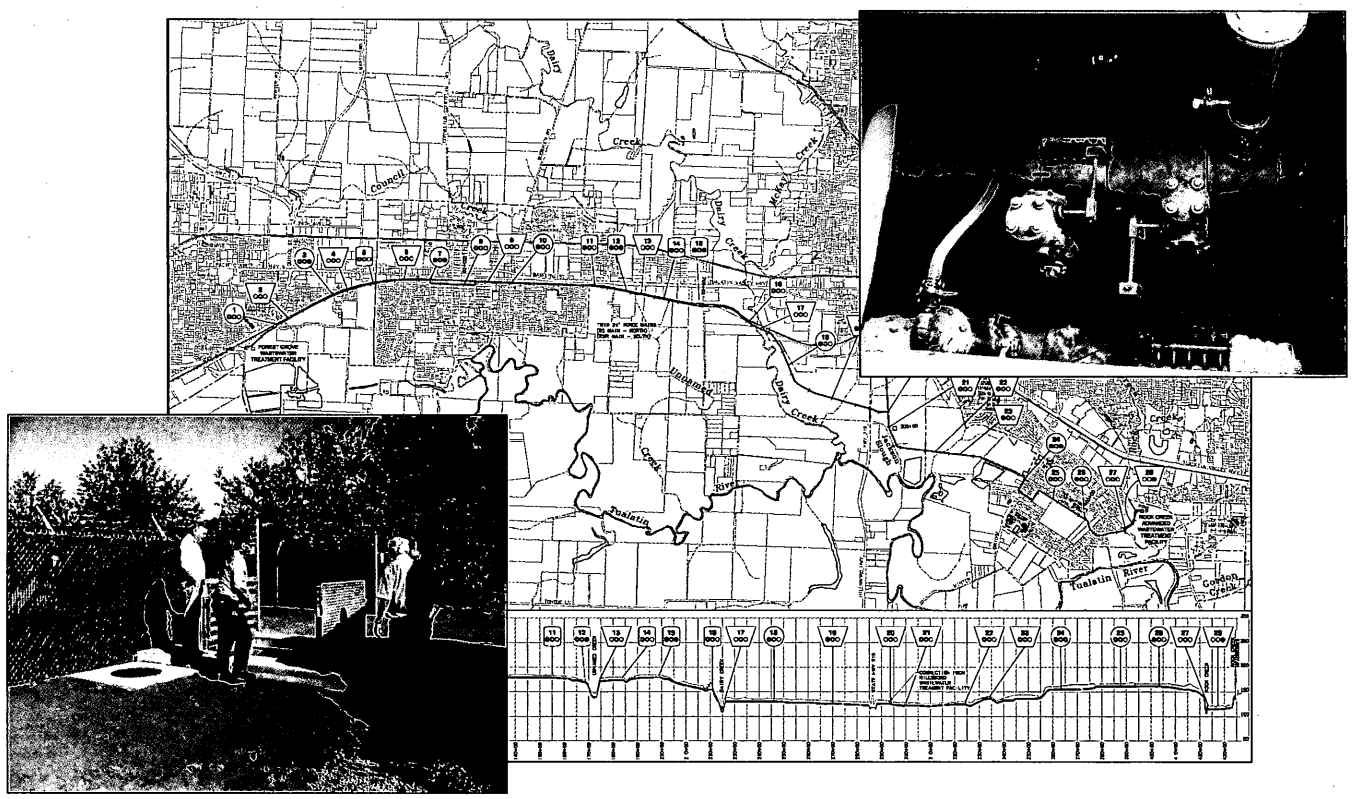
OSCI Sanitary Sewer System Project, Phase Two for the Oregon State Department of Corrections, a joint project with the Cities of Salem and Turner included approximately 2 miles of 18-inch through 36-inch diameter sanitary sewer. The project included basin planning and analysis of multiple alternatives involving trunk sewer routing options and capacity options for accommodating City of Turner wastewater flows. The project was complicated by highway, freeway, railroad, creek and wetlands crossings, required extensive evaluation of various routing alternatives. Successful coordination was completed with numerous agencies including lead agencies, ODOT, the railroad, and permitting agencies. Engineering included design provisions for a parshall flume flow metering station, H_2S corrosion control and other special provisions for work in environmentally sensitive stream and wetland areas. MSA facilitated a joint three party funding arrangement for this "common" project in support of two intergovernmental agreements between the Oregon Department of Corrections and the Cities of Salem and Turner.



Project: Gravity Sewer Feasibility Study
Owner: City of Gresham
Contact: Jim Montgomery, Senior Engineer, 503.618.2437
Project Cost: $40,000
Project Completed

Description:

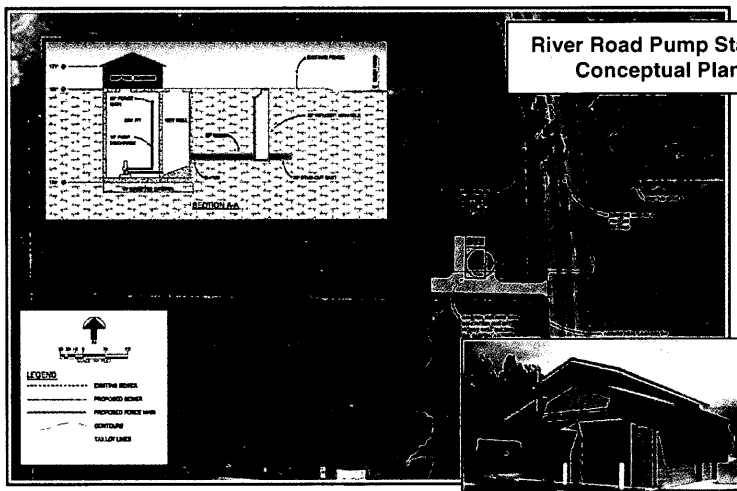
MSA completed a feasibility study for serving the City of Gresham's Linneman Sewer Basin through a gravity tunnel as an alternative to expanding the Linneman Pump Station capacity. Alternatives analyses considered 11,000 feet of 48-inch to 60-inch gravity sewer to replace the City's existing 10-million gallon per day (mgd) Linneman Sewage Lift Station and 18-inch force main. Engineering work included a gravity sewer route alternatives analysis, gravity sewer capacity modeling, construction method analysis comparing boring, micro tunneling and open trench piping installation, construction cost review, construction feasibility investigation, and analysis of the upstream collection system to determine if these facilities could be served by the proposed gravity system. The proposed route includes challenges related to wetland permitting, deep excavation, major roadway crossings and coordination with proposed City linear park and trail way improvements. The project involved permitting with multiple jurisdictions, coordination with other utilities and TriMet facilities, and easement acquisitions.



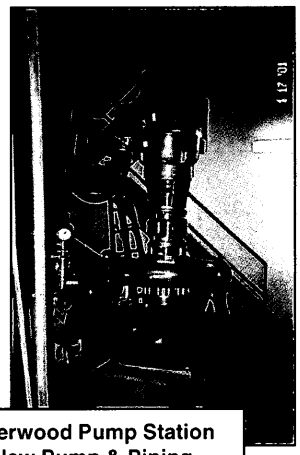
Project: Twin 24-inch Force Mains Corrosion Improvements
Owner: Clean Water Services
Contact: Scott Woodbury, Engineering Project Coordinator, 503.547.8180
Project Cost: $1,700,000
Current Project

Description:

MSA was retained by Clean Water Services (CWS) to perform a corrosion evaluation of two 24-inch diameter PVC sewer force mains. The twin 24-inch force mains transport sewage from the Forest Grove and Hillsboro Wastewater Treatment Facilities to the Rock Creek Wastewater Treatment Facility, covering a distance of approximately 10 miles. CWS relies on having these two force mains in service continuously to meet all operational and permitting requirements. CWS's maintenance staff had reported significant corrosion in valve vaults along the force main. MSA worked in association with Cascade Corrosion Consulting Services, Inc. (CCCS) to produce a comprehensive corrosion evaluation. The analysis identified a number of corrosion issues; problems associated with hydrogen sulfide were most severe, but other potential problems included galvanic and atmospheric corrosion. Following field investigations to confirm current conditions, MSA developed recommendations regarding corrective measures and a sequencing and methodology plan to enact the recommended repairs while maintaining reliable force main service. Several portions of the force main route pass through corrosive soils. All buried metallic items on the force mains installed in corrosive or moderately corrosive soils will be protected with buried anodes to prevent further corrosion. A portion of the pipeline located at a creek crossing is constructed of ductile iron. An impressed current system, installed at either end of the creek crossings, was recommended. During the summer of 2008, five of 28 vaults, and their internal components, were replaced. Construction documents for the replacement of 23 additional vaults and installation of anodes and impressed current systems over the next three construction seasons are currently being prepared.

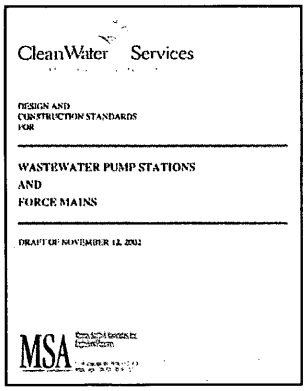


River Road Pump Station Conceptual Plan



Sherwood Pump Station New Pump & Piping

Pump Station Completed



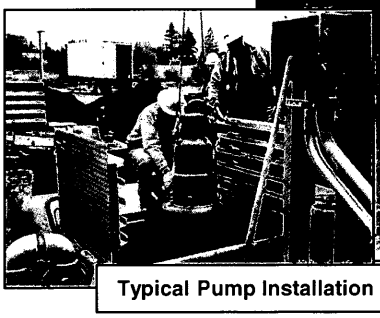
CleanWater Services

DESIGN AND CONSTRUCTION STANDARDS FOR

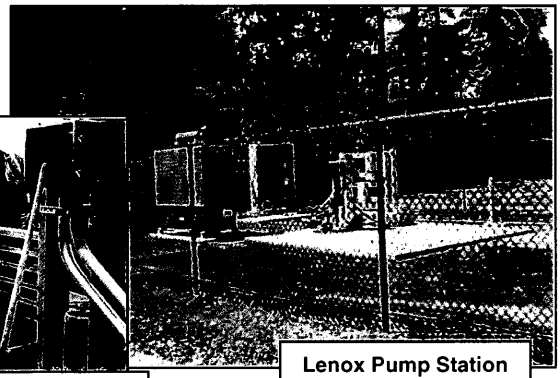
WASTEWATER PUMP STATIONS AND FORCE MAINS

DRAFT OF NOVEMBER 12, 2002

MSA



Typical Pump Installation



Lenox Pump Station

Project: Various Assignments
Owner: Clean Water Services
Contacts: Nate Cullen, P.E., Engineering Division Manager, 503.547.8176
Scott Woodbury, Engineering Project Coordinator, 503.547.8180

Current Project

MSA

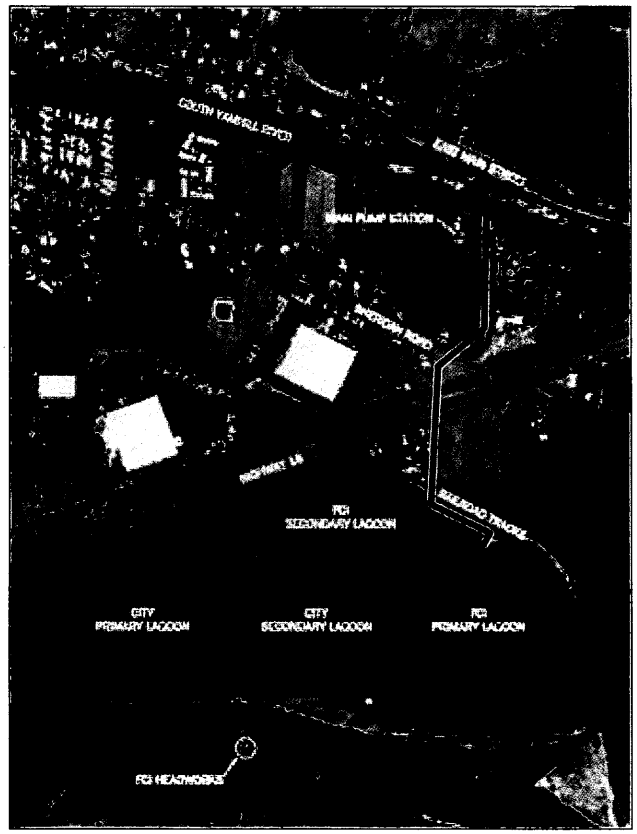
CleanWater Services
Our commitment is clear.

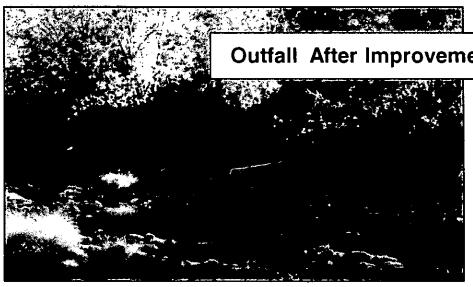
Description:

Over the past seven years, MSA has provided engineering services to Clean Water Services on multiple projects, including assisting with plan reviews of developer-designed pump stations, development of new pump station design standards, upgrades of existing pump stations, and designs for new pump stations and force mains:

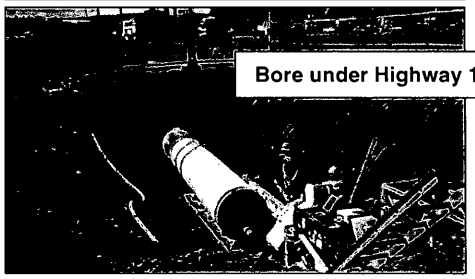
- Lenox Pump Station
- Sherwood Pump Station
- Gaston Pump Station
- Rock Creek Ranch Pump Station
- River Road Pump Station
- Pine Lodge Pump Station
- Pleasant View Pump Station
- Nyberg Pump Station

MSA services have included evaluations of existing facilities, preliminary design reports, final designs with plans and specifications, permitting and procurement assistance, inspection and construction management services, start-up assistance, and preparation of operation and maintenance manuals.




Outfall After Improvements

Outfall Before Improvements


Bore under Highway 18W

Project: Wastewater Treatment Plant Outfall Pipeline Improvements
Owner: City of Sheridan, Oregon
Contact: Lonnie Hinchcliff, Public Works Director, 503.843.2660
Estimated Project Cost: $400,000
Project Completed

Description:
For the period of November 1 through April 30 each year, the City of Sheridan discharges treated wastewater effluent through an outfall pipeline to the South Yamhill River. The combination of high influent flows and limited outfall pipeline capacity have historically caused water levels in the lagoons to approach the top of the dikes. Additional pipeline capacity was needed to allow for efficient operation of the WWTP and to allow the City to operate within the NPDES wastewater discharge permit requirements.

MSA was retained by the City of Sheridan to prepare construction documents for upgrading the City's wastewater treatment plant river outfall pipeline. The City committed to a "fast-track" design so that construction of the outfall improvements could be completed in the Fall of 1999. MSA designed a new 24-inch diameter outfall pipeline, complete with a new electromagnetic flow meter for monitoring effluent flow rates. The pipeline was sized to accommodate peak flows (7.0 to 8.0 mgd) through build-out within the urban growth boundary. The project also included a 30-inch diameter section of pipe into the South Yamhill River that was sized to allow for the next phase of improvements in 50 to 75 years. Construction of the improvements includes bored crossings under State Highway 18 and the Willamette-Pacific Railroad. Permits for the project included DEQ construction plan approval; a Corps of Engineers nation-wide "404" permit, which included review and comment by the National Marine Fisheries Service; an Oregon Division of State Lands removal/fill permit for work in the river; an ODOT permit for the crossing of Highway 18; and a railroad permit for crossing of the railroad. Construction management services were also provided throughout the duration of the project by MSA.

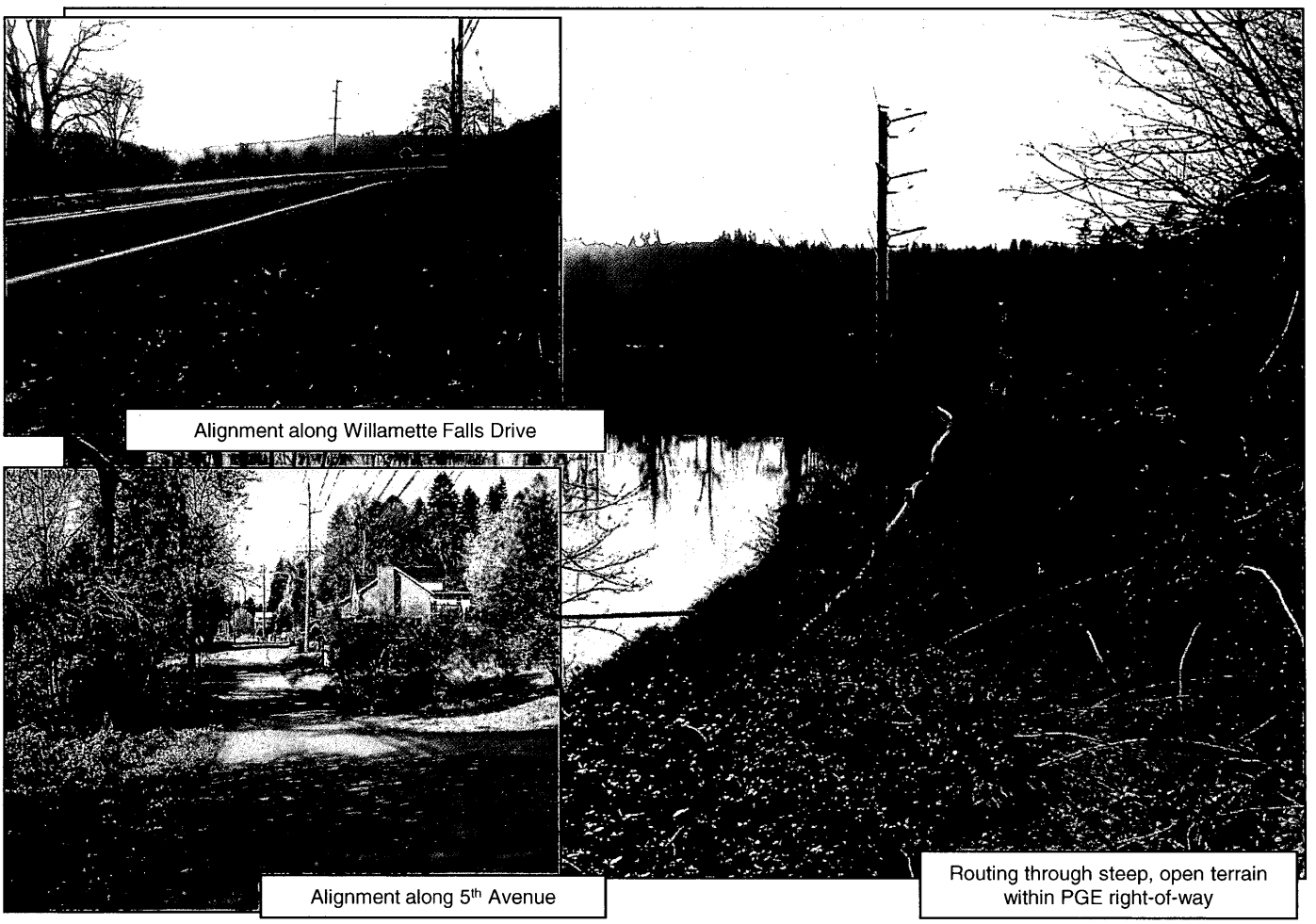
Project: Miles Crossing Vacuum Sewer System Project
Owner: Clatsop County and Miles Crossing Sanitary Sewer District, Clatsop County, Oregon
Contact: Ed Wegner, Public Works Director, 503.325.8611
Project Cost: $6,200,000
Current Project

Description:

MSA was retained by Clatsop County to design a vacuum sewer system project for the Miles Crossing Sanitary Sewer District. The District, located across Youngs Bay south of the City of Astoria, currently has a population of approximately 1,000. Sewage is currently disposed of by on-site systems with a very high failure rate. A unique vacuum sewage collection system was recommended for implementation in the previously completed facilities plan for the area. The vacuum system is advantageous in flat, low-lying areas with high groundwater and poor soil conditions, which is the case in Miles Crossing. Disposal of raw sewage to the City of Astoria's sewer system was recommended in the facilities plan.

Approximately 42,000 feet of vacuum sewer was designed. The project includes a complete new connection from the foundation of each home, business and other structure to the new vacuum collection system. MSA performed on-site investigations and designs on private properties for over 375 structures to be served. The existing on-site disposal systems will be decommissioned under the project. The project includes a central vacuum station which contains a vacuum sewage collection tank, vacuum pumps, standby generator, an emergency raw sewage storage tank, and related facilities. Duplex 500 gpm sewage pumps in the station pump from the vacuum tank to an 8-inch diameter,10,900 foot long force main which discharges to the City of Astoria's sewer system on the north side of Youngs Bay. The force main was installed under Youngs Bay using horizontal directional drilling techniques.

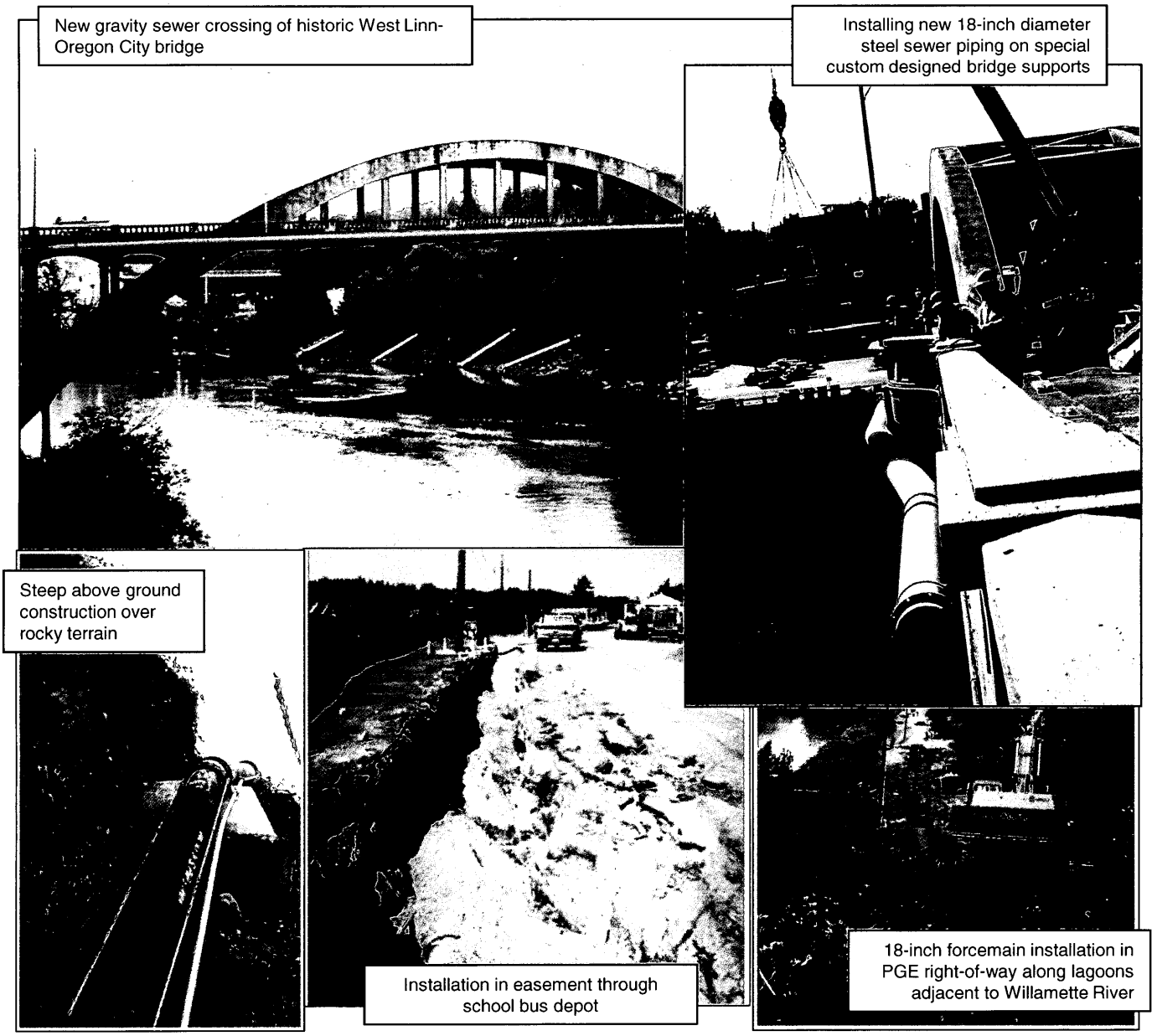
MSA has supported the County and the District in public meetings to review the project with local residents and provide guidance on private property connection policies and other related issues. MSA developed a project brochure for distribution to the residents and assisted with preparation of easement descriptions and property access agreements.



Project: Sanitary Sewer Capital Improvements: Fourth Street to Willamette Falls Drive
Owner: City of West Linn
Contact: Boris Piatski, P.E., Civil Engineer, 503.722.5519
Project Cost: $535,000
Project Completed

Description:

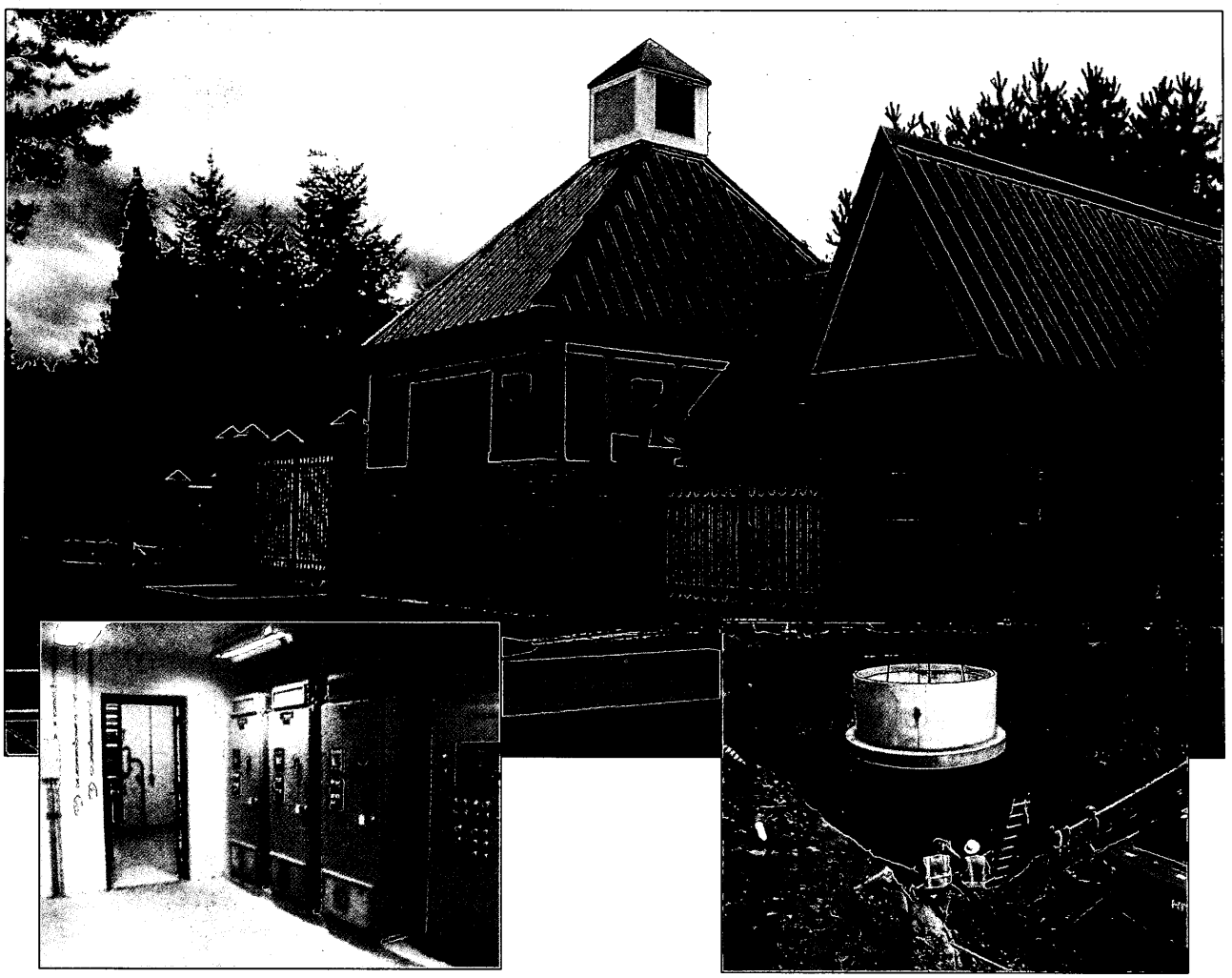
As part of the City of West Linn's planned capital improvements, MSA led the evaluation and design engineering for the upsizing and replacement of 2,700 feet of existing 12-inch inside diameter asbestos cement gravity sewer pipe with larger 15-inch diameter pipe. The sewer parallels Willamette Falls Drive at the east end and passes down steep, rocky terrain along 5th Avenue to a pump station near the Willamette River. Open trench and pipe bursting installation methods were evaluated and determined feasible, so MSA included contract provisions for bidding alternate methods and alternate materials, using PVC or HDPE pipe, to determine the most cost efficient approach. The design included several crossings of existing large diameter utilities including an 18-inch force main sewer, 30-inch drainage culvert, 28-inch private HDPE wastewater line and 10-inch waterline. The design incorporated the reuse of existing manholes, and included provisions for rock excavation and coordination with local property owners for rights-of-entry. Construction was completed in the summer of 2008.



Project: West Linn Force Main and Gravity Sewer
Owner: Tri-City Service District, Clackamas County, Oregon
Contact: Dennis Koellermeier, former Public Works Director, 503.718.2596
Project Cost: $1,000,000
Project Completed

Description:

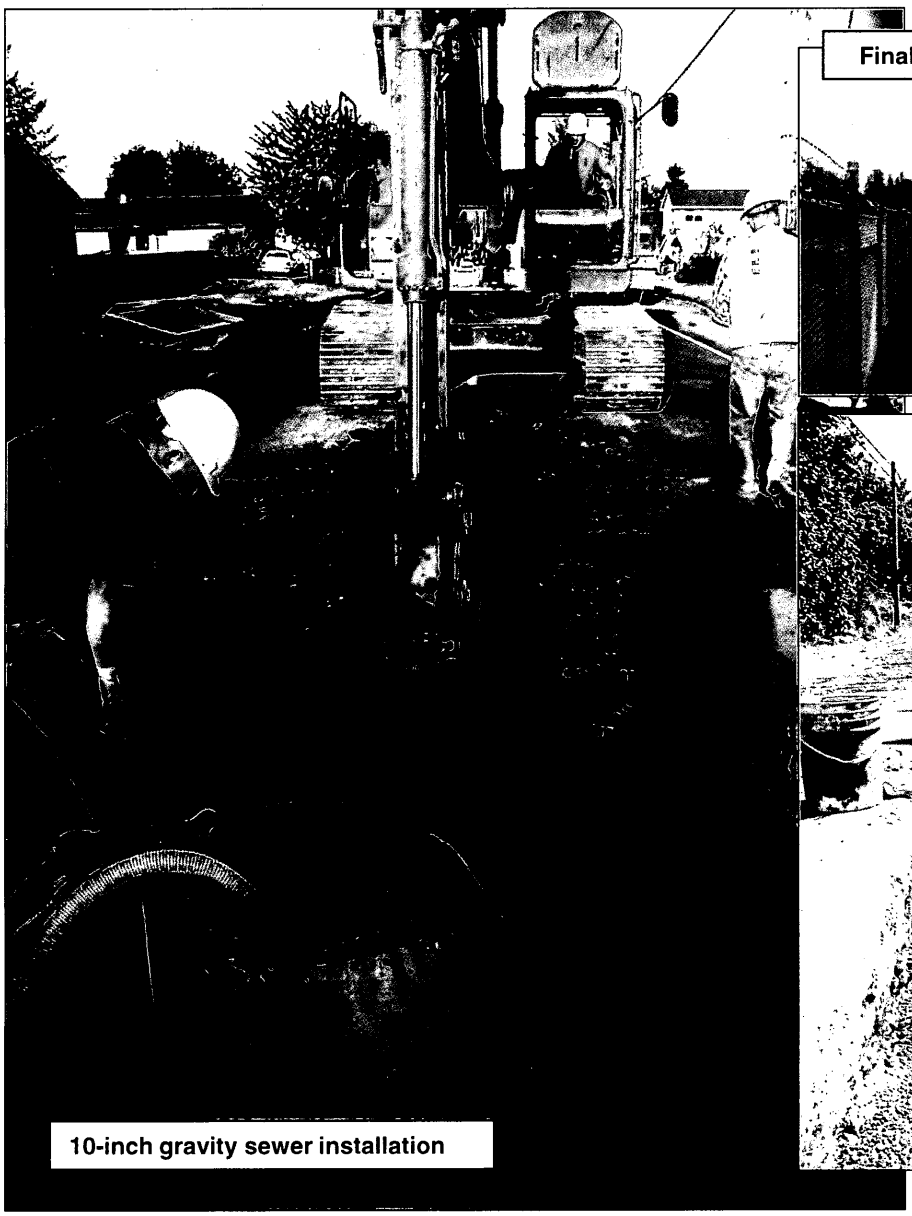
Three force mains and a gravity sewer all totaling 16,000 feet in length for the Tri-City Service District (TCSD) sewerage program were designed to transmit sewage from West Linn to the new TCSD sewage treatment plant in Oregon City. Force mains were 12 inches to 18 inches in diameter and the gravity sewer was 24 inches in diameter. Installation was completed over variable terrain including trench blasting in solid rock. Installation was completed over variable terrain including trench blasting in solid rock. An air injection system was designed for the 18-inch diameter Willamette Force Main and highly specialized designs were completed for the gravity sewer crossing the historic Oregon City-West Linn Bridge.



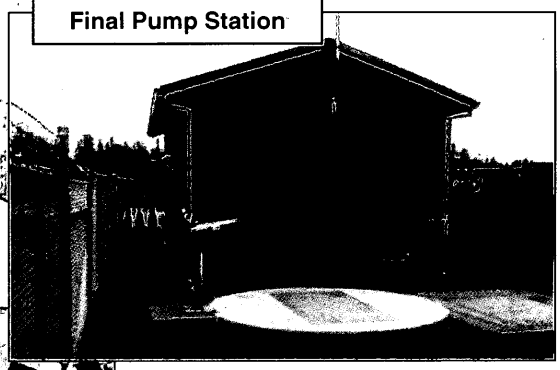
Project: Willamette Lift Station Evaluation and Upgrade
Owner: City of Lake Oswego, Oregon
Contact: Joel Komarek, P.E., Engineering Director-Interceptor Sewer Project, 503.697.6588
Project Cost: $1,372,000
Project Completed

Description:

Murray, Smith & Associates, Inc. (MSA) completed an evaluation study, a preliminary design report, final design and construction management for replacement of the City's largest sewage lift station to expand its capacity and provide for increased reliability. The selected design called for abandoning the existing package lift station, installing three 1,900 gpm submersible pumps in a new wet well, 75 hp variable frequency drives, and a permanent standby generator enclosed within a new control building. The building featured special architectural details to fit with the surrounding buildings and public spaces, and an attached fenced enclosure to conceal existing trash facilities that serve the nearby commercial businesses. Construction of the 38-foot deep wet well required tightly-controlled blasting of the underlying basalt formation. Advance procurement of pumps, drives and generator was implemented. Temporary bypass pumping was accomplished with line-stopping of the existing force main. MSA also provided inspection and construction management services.



10-inch gravity sewer installation



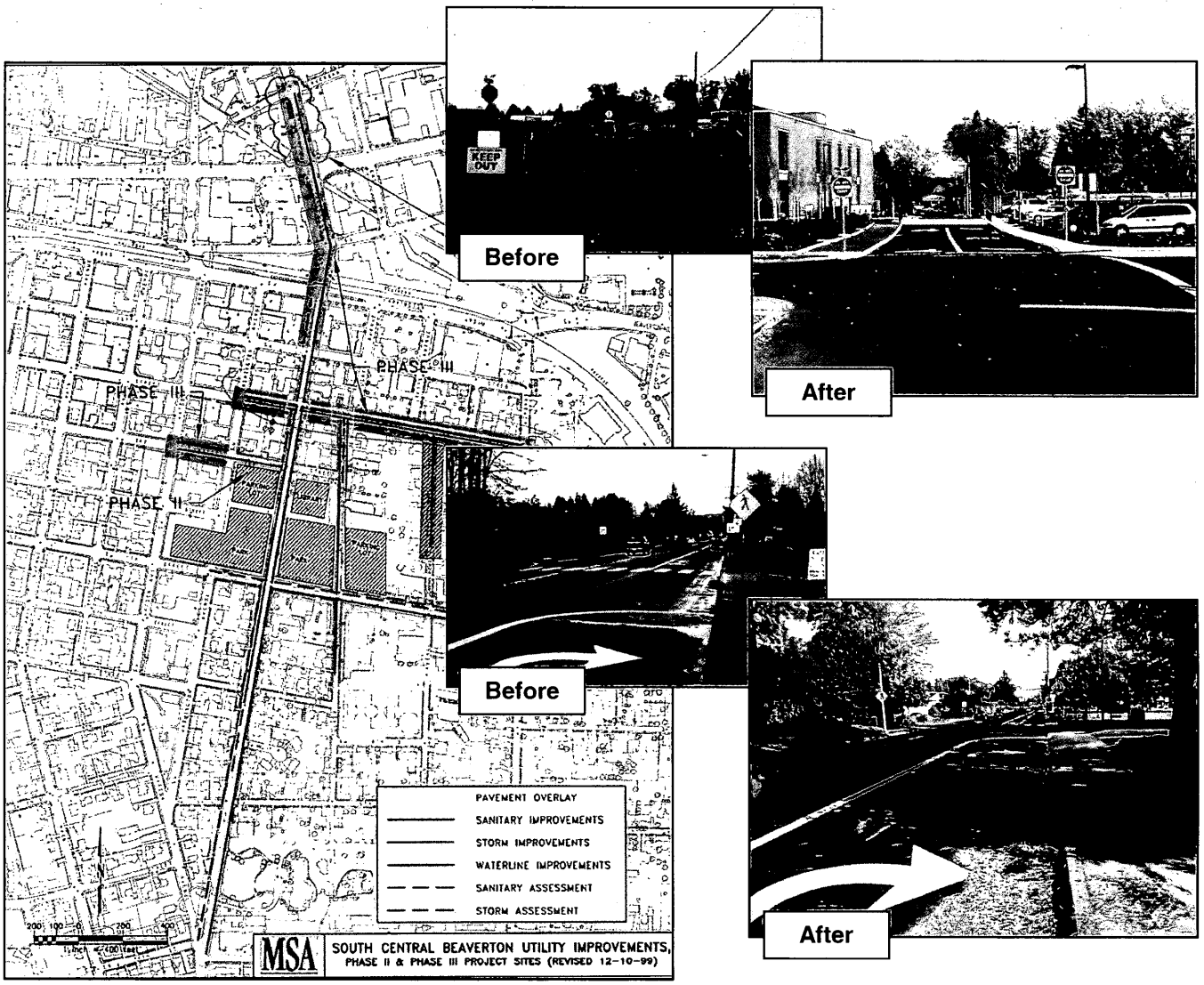
Final Pump Station

10-inch Force Main Installation

Project: Alternative 4 Sanitary Sewer Improvements
Owner: City of Wood Village
Contact: Carl Malone, Former Public Works Director, 503.465.9650
Project Cost: $1,500,000
Project Completed

Description:

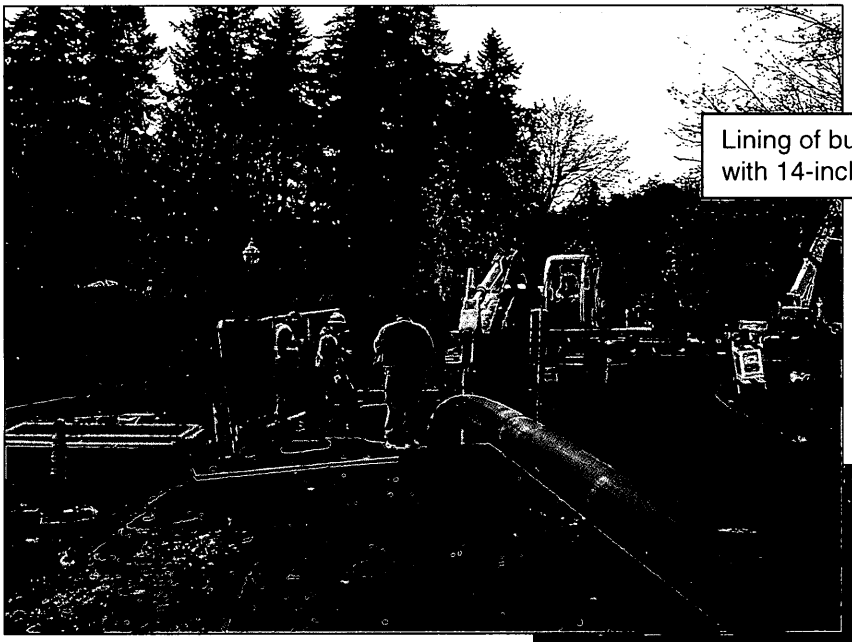
MSA prepared designs for sanitary sewer improvements in the City of Wood Village to add system capacity to accommodate build-out and the proposed 87-home Centex Development. Designs included modeling of the sewer system, and development of contract documents and drawings for a 1,200- gallon per minute (gpm) pump station, 4,300 feet of force main, a flow diversion structure and 800 feet of gravity sewer. The pump station included submersible pumps, on 8-foot diameter wetwell, a metering vault and a chemical feed system to control hydrogen sulfide production in the force main.



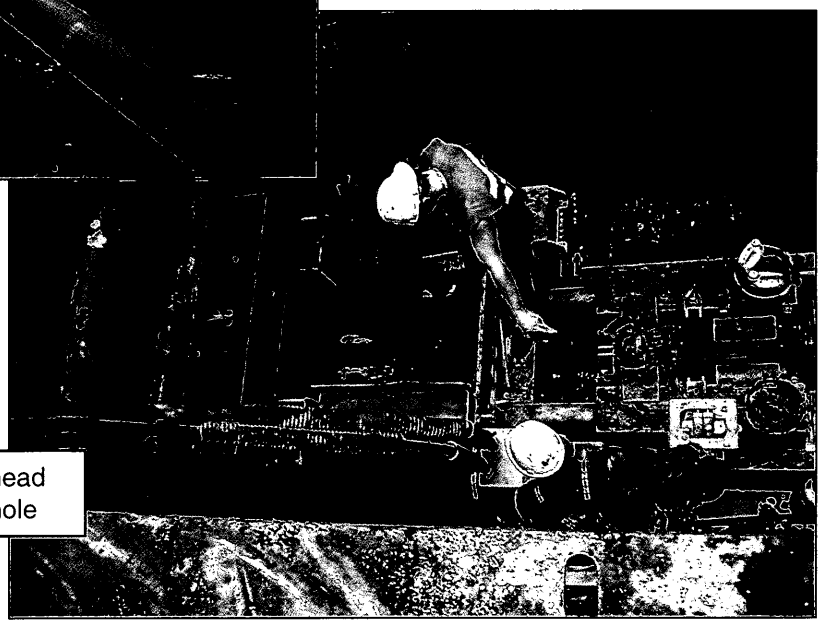
Project: South Central Beaverton Utility Improvements – Phase II Sanitary Sewer
Owner: City of Beaverton, Oregon
Contact: David Winship, P.E., City Utilities Engineer, 503.526.2434
Project Cost: $2,400,000
Project Completed

Description:

MSA planned and designed the City of Beaverton's South Central Beaverton Utility Improvements, Phase II project, which included water, sanitary sewer, storm sewer and street improvements. For the sanitary sewer system, MSA completed a comprehensive assessment of approximately 4,600 feet of existing sewer mains and associated laterals. The evaluation considered replacement of the aging mains utilizing open trench construction and in-place upgrading alternatives including cured-in-place pipe (CIPP) and fold-and-form pipe. The selected alternative, CIPP, was designed by MSA as part of the overall utilities and street improvement project. The project was completed on a fast-track basis in time for the grand opening of the City's new library which was located within the project limits.



Lining of burst existing sewer with 14-inch diameter HDPE

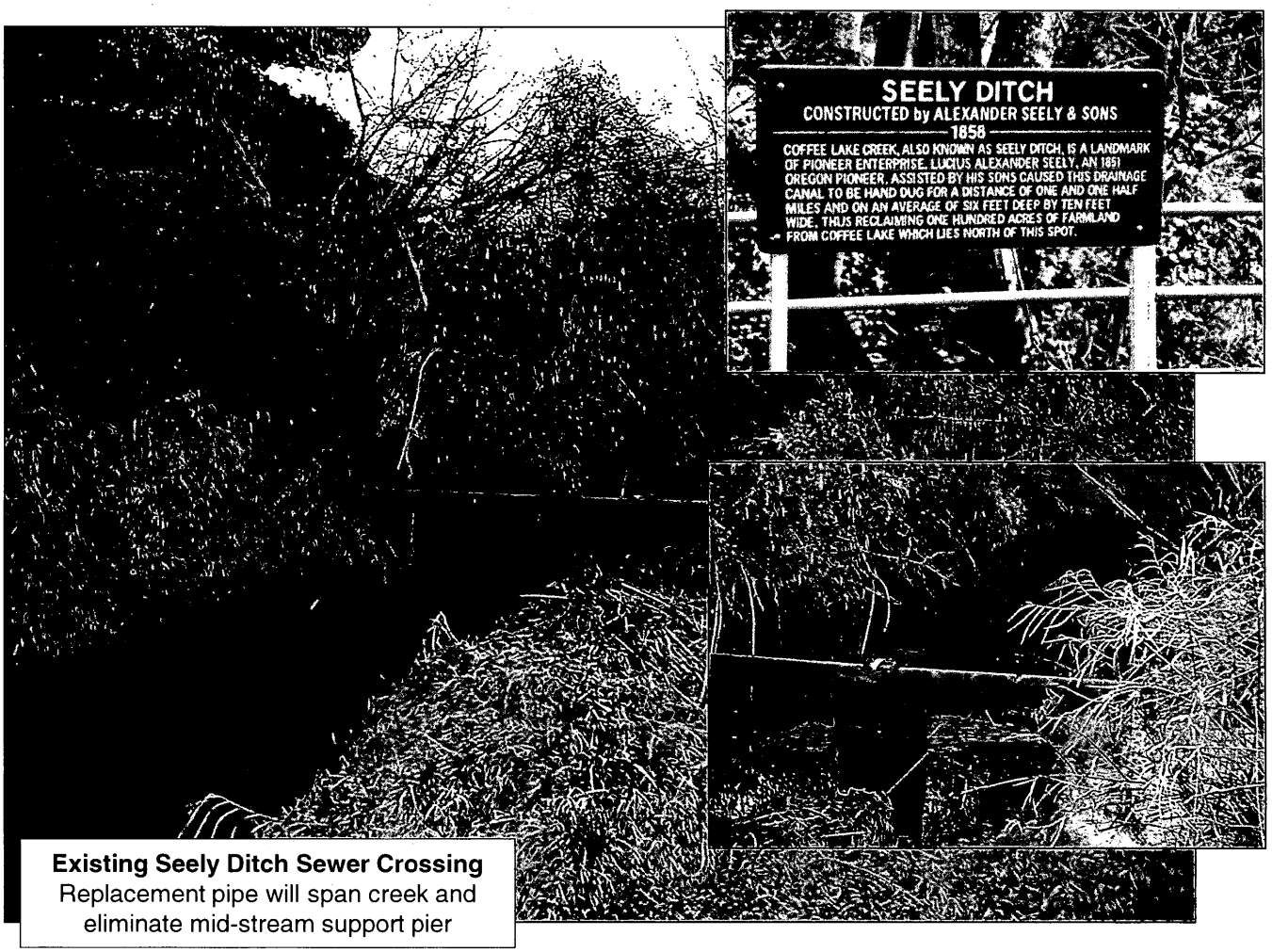


Pulling pipe bursting head through existing manhole

Project: Garthwick Combined Sewer Project
Owner: Bureau of Environmental Services, City of Portland, Oregon
Contact: John Houle, Supervising Engineer, 503.823.7216
Project Cost: $1,500,000
Project Completed

Description:

The Garthwick Combined Sewer project upgraded and rerouted existing combined sewers to significantly reduce frequency of combined sewer overflows to the Willamette River and reduce flows to an existing pump station. Work began with basin analysis and design flow confirmation. The project consisted of replacing existing concrete sewers with approximately 5,600 feet of 12-inch through 32-inch diameter HDPE sewer piping. The project included replacing existing storm drainage inlets and connections to existing sewer laterals. Replacement of existing concrete sewers included approximately 580 feet of pipe bursting with 14-inch diameter HDPE piping. The project was complicated by design of storage piping and a flow control manhole, bored and jacked railroad undercrossing and modifications to an existing combined sewer overflow diversion manhole.



Existing Seely Ditch Sewer Crossing
Replacement pipe will span creek and eliminate mid-stream support pier

Project: Seely Ditch Sanitary Sewer Replacement Project
Owner: City of Wilsonville, Oregon
Contact: Rob Palena, P.E., Project Manager, 503.519.2748
Project Cost: $21,000
Current Project

City of WILSONVILLE In OREGON

MSA

Description:

MSA is providing final design services for the City's Seely Ditch Sanitary Sewer Replacement Project, which involves improvements to eliminate an existing "belly" in a lateral sewer line that crosses Seely Ditch. The project consists of a new parallel sewer to replace 400 feet of existing 8-inch diameter sanitary sewer, including the crossing at Seely Ditch. The existing sewer crosses the stream, supported on a mid-stream concrete pier, and connects to the 30-inch diameter United Disposal Interceptor. The new sewer will be placed in an alignment adjacent to the existing sewer and will span the stream in a larger sized casing with supporting abutments on each stream bank, allowing the existing mid-stream pier and pipeline to be removed. Prior to project construction, MSA prepared permit applications for the Corps of Engineers/Division of State Lands 404 wetland permit. In addition, MSA coordinated the procurement of easements from three separate private property owners for the pipeline alignment.

Finished structure with surface mounted electric gate operators

Diversion structure and 72-inch diameter bypass piping under construction

Project: North River Road Diversion Structure
Owner: City of Salem, Oregon
Project Cost: $1,400,000
Project Completed

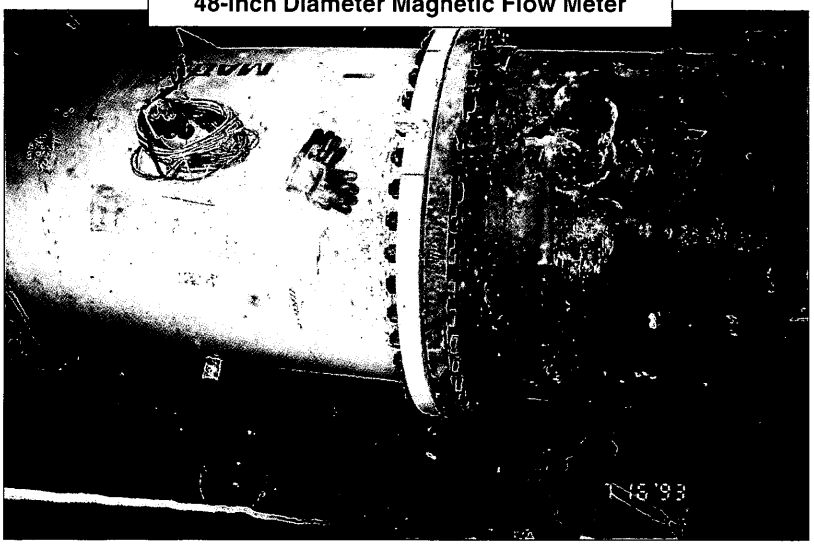
CITY OF Salem AT YOUR SERVICE

MSA

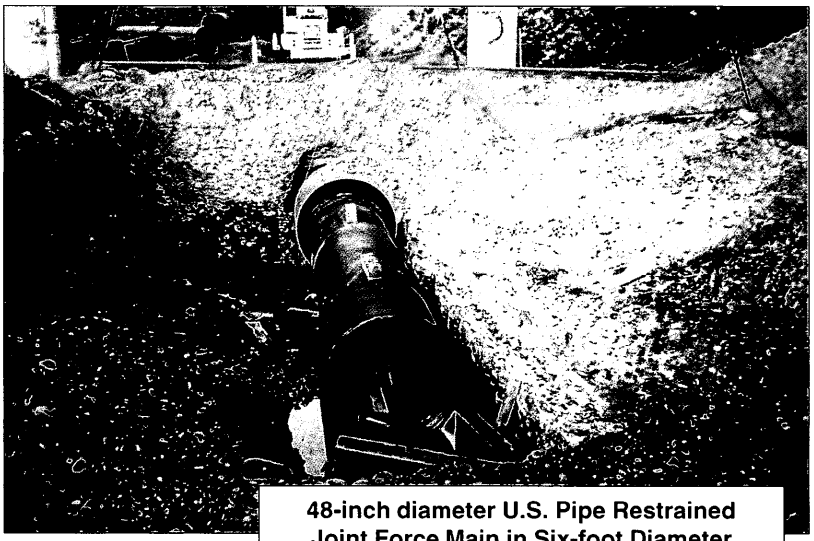
Description:

MSA completed the planning and design of a new sewage diversion structure for the City of Salem. The work was located on the City's main 72-inch diameter interceptor sewer. The work included major modifications to two existing flow control structures, and reconstruction of a section of the existing 72-inch diameter sewer. The project included a new entrance road and other site improvements to City park property within which the project was located. The diversion structure included three electrically actuated fabricated slide gates to provide controlled emergency flow diversion to the Willamette River.

48-inch Diameter Magnetic Flow Meter



48-inch Diameter Restrained Joint Ductile Iron Force Main



48-inch diameter U.S. Pipe Restrained Joint Force Main in Six-foot Diameter Casing Beneath Railroad

Special Direct Dig Tunneling Operation

Project: Sullivan Pressure Line Replacement
Owner: City of Portland, Bureau of Environmental Services
Contact: David Singleterry, Retired, 503.236.9448
Project Cost: $750,000
Project Completed

Description:

MSA assisted the City of Portland Bureau of Environmental Services with planning and design of the Sullivan Pressure Line Replacement. The project consisted of the replacement of an existing cast-in-place reinforced concrete pressure sewer with a new 48-inch diameter, 1,000-foot long ductile iron force main. A 200-foot long section of the force main was located within a tunnel. The project included a cased crossing of a railroad, a crossing of Interstate 5, and installation of a new 48-inch diameter magnetic flow meter.

MSA

SECTION 3

Team Presentation and Organization

Murray, Smith & Associates (MSA) presents the City of Springfield a highly qualified, experienced, capable and reputable project team to complete this important trunk assignment. The MSA team presents extensive relevant experience in all aspects of the work. Personnel from team subconsultant firms will assist with certain specialty aspects of the project. All team members are experts in their assigned field and are familiar with the project area through related work. Our team provides strong local representation. Much of the work will be completed by MSA personnel reporting from the MSA Springfield office and OBEC Consulting Engineers (OBEC) personnel reporting from OBEC's Eugene office. Anticipated project roles are highlighted in the project organization chart below.

City of Springfield
ENGINEERING SERVICES FOR SCOPING, DESIGN AND INSTALLATION
OF THE JASPER TRUNK SEWER
Project P20353

City of Springfield Project Manager
Pam Ownbey, P.E.

Principal-in-Charge
Phil Smith, P.E. (MSA)

MSA Project Manager
Kyle McTeague, P.E.

Senior Reviewer, QA/QC
Jim Helton, P.E. (MSA)

Murray, Smith & Associates, Inc.	
Matt Hickey, P.E.	Project Engineer
David Stangel, P.E.	Hydraulic Analyst
Bill Evonuk, P.E.	Design Engineer
Garry Truyens	Staff Engineer
Bill Hollings, P.E.	Construction Manager
Mark Smith	Field Inspection
Kent Harjala	CAD Technician

Subconsultants	
Jerry Lane, P.E. (OBEC)	OBEC Group Project Manager
Jim Colton, P.L.S. (OBEC)	Surveying
Doug Appel, P.E. (OBEC)	Permitting Assistance
James Stupfel (OBEC)	Environmental Science
Jim Maitland, P.E. (FEI)	Geotechnical Engineering
Leslie Finnigan (UFS)	Right-of-Way Acquisition
David Collins, P.E. (DJCE)	Tech. Advisor - Modeling

Key Personnel

Key staff credentials are highlighted in brief biographical summaries presented below.

Principal-in-Charge

Phil Smith, P.E., an MSA founding principal, offers over 36 years of wastewater system engineering experience. Phil has directed key MSA wastewater improvements programming for numerous Pacific Northwest communities, including the firm's recent/ongoing work for the City of Springfield. Phil is also overseeing MSA's current wastewater effluent reuse pipeline project nearby for the City of Cottage Grove. Phil has overseen MSA's recent sewage system design work for the Miles Crossing Vacuum Sewer System project that has involved close coordination with the City of Astoria, Clatsop County, the Miles Crossing Sanitary Sewer District, the Oregon Department of Environmental Quality (DEQ), and other state and federal funding agencies. This project involves extensive work on private properties and across environmentally sensitive waterways and wetlands. Phil has also managed a series of major wastewater and stormwater combined sewer overflow (CSO) planning and improvement projects for the City of Portland, Bureau of Environmental Services (BES) and similar work for the City of Salem. He currently oversees MSA's wastewater system engineering for the cities of Troutdale and Wood Village. These and other various projects have involved comprehensive facilities plans, complex system alternatives analyses, hydraulic analyses, pipeline routing studies, pump station improvements, gravity sewers and force mains, CSO control improvements, special corrosion control facilities, river crossings, railroad crossings, special environmental permitting and special grant funding programs and administration. For this project, Phil will operate in an important oversight capacity, applying appropriate strategic thinking as various alternatives are developed and considered. Phil's senior level guidance will ensure that practicable solutions are achieved that best fit with the project's unique circumstances. Phil will serve as principal-in-charge.

Senior Reviewer, QA/QC

Jim Helton, P.E., an MSA senior vice president, will provide senior-level QA/QC review for the trunk sewer work. Jim has played a key role on numerous sanitary sewerage system analysis and planning projects. Jim managed MSA's $15 million utilities extension project for the City of Aberdeen that included overall system planning and design for two new sewage pump stations and six miles of sewage force main, including six creek crossings and a crossing of Grays Harbor, all using directional drilling methods. Jim currently oversees MSA's sewerage system work for the City of Sheridan, where the firm acts as City Engineer. MSA's work in Sheridan has included sanitary sewer system master planning, wastewater treatment plant capacity studies, wastewater treatment facilities planning, treated effluent river outfall mixing zone studies, sewer design, sewage pump station design and treated effluent outfall design. Jim manages the firm's work for Oregon City and Clean Water Services (CWS) where MSA is engaged in numerous sewage pump station projects as part of an ongoing flexible services contract. This work has included designs for the repair and rehabilitation of twin 24-inch diameter, nine-mile long force mains. Jim also managed MSA's recent sanitary sewerage system master planning work for the City of Dundee and served in a technical advisor role for

MSA's City of Sherwood Sanitary System Master Plan. Jim currently provides senior-level QA/QC reviews on a wide range of MSA projects.

Project Manager

Kyle McTeague, P.E., an MSA associate, will serve as project manager. Kyle is currently managing MSA's wastewater collection system improvement and I&I reduction program for the City of Springfield, involving the rehabilitation of over 35,000 feet of 8-inch to 15-inch diameter sanitary sewer mains and the replacement of approximately 175 manholes and approximately 25,000 feet of service laterals. The project also includes cured-in-place lining of 3,000 feet of 42-inch sewer. Kyle also served as MSA's project engineer for the multi-agency City of Salem/Oregon State Corrections Institute (OSCI)/City of Turner Phase II Trunk Sewer project. This project involved over two miles of 18-inch to 48-inch diameter gravity sewer with three creek crossings and two bored/tunneled highway and railroad crossings. Work involved the analysis of routing alternatives, alternative pipeline material analysis, wetlands permitting, railroad permitting property acquisition and intergovernmental agreement development. This was a challenging project that was complicated technically and politically. Kyle is currently managing a similar sewer system improvement project for the Oregon Department of Corrections (ODOC) that will reroute part of the OSCI wastewater flow into the City of Salem's existing collection system along State Highway 22.

Kyle serves as MSA's City Engineer representative in King City and North Plains where the firm is currently completing sewer system design work that is being coordinated with Clean Water Services. Kyle has managed similar MSA sewer design work for the Oak Lodge Sanitary District and the City of Portland, Bureau of Environmental Services.

Project Engineer

Matt Hickey, P.E., an MSA principal engineer with 15 years of experience, will serve as project engineer. Matt has extensive sewer system planning, design and construction administration experience with other local agencies, including the cities of Portland, Gresham and Wood Village. Matt is MSA's project engineer on the firm's current sewer work at the OSCI Salem facility for ODOC. He was assistant project engineer for MSA's Clatsop County/Miles Crossing Sanitary Sewer District vacuum sewer project. Matt served as MSA's assistant project manager on the Sellwood-Garthwick Unit 3 project for the City of Portland BES, which involved sanitary sewer pipe bursting within congested utility corridors. He has also managed several sewage system planning and design projects for Wood Village, Milwaukie and Beaverton that involved alternatives analysis, sewage pump station design, gravity sewers and force mains. Matt managed MSA's Sanitary Sewer Capital Improvements project for the City of West Linn, Oregon, which included pipe bursting alternatives.

Matt served as MSA's assistant project manager on the City of Gresham's trunk sewer project, which included 12,000 feet of 36-inch to 54-inch gravity sewer in a congested utility corridor. Matt also managed MSA's Linneman Trunk Sewer Feasibility Analysis project for Gresham. This project involved preliminary engineering for 11,000 feet of 48-inch to 60-inch gravity sewer to replace a large sewage pump station. As project manager for the City of Gresham's Kelley Creek Interceptor Analysis and the City's Jenne Road – Pleasant Valley

Interceptor project, Matt was involved in permitting and designs for 9,000 feet of 24-inch to 36-inch gravity sewer. Matt is a well-rounded engineer who has developed broad trust and respect with MSA's public agency clients.

Hydraulic Analysis/ Modeling

David Stangel, P.E., an MSA managing principal, will provide hydraulic analysis and modeling as may be required. David specializes in hydraulic modeling, system analysis, GIS and public facilities master planning. David uses the latest, state-of-the-art software tools in modeling sanitary sewer systems. He has been involved in more than 60 master plans of wastewater and water system projects in the past 15 years. David has performed modeling and system analysis for numerous growing central and western Oregon communities of similar size to Springfield, including for the cities of Bend, Tualatin, Redmond, Gresham and The Dalles. For the City of Bend's Sewer Collection System Model and Capital Plan project, David performed storm frequency analysis, network review, model calibration, a hydraulic analysis of system deficiencies and recommended improvements.

Design Engineer

Bill Evonuk, P.E., a firm associate, will serve as design engineer. Bill assisted with MSA's design engineering for the Miles Crossing Vacuum Sewer System, an $8 million sewer system project with extensive work on private properties. Bill managed the construction for MSA's utility undergrounding and downtown streetscape enhancement work for the City of Sandy, Oregon. Bill is experienced with all aspects of utility engineering and is particularly experienced with the specialty elements of this project, namely, deep excavations, large diameter piping, sheeting and shoring systems, dewatering systems, sewer design and construction, drainage systems, other public and private utilities, and roadway improvements. Bill is familiar with the local area through MSA's ongoing sewer system design work for the City of Springfield.

Garry Truyens will also assist as a staff engineer. Garry assisted on MSA's recent City of Springfield sewer rehabilitation project. Currently, Garry is assisting with flow analysis and a pump station capacity study for MSA's Wastewater Treatment Facility and Force Main Upgrades project for the City of Sheridan.

Construction Manager

Bill Hollings, P.E. is an MSA principal engineer with 32 years of experience in the civil and construction engineering field. Bill manages MSA's Springfield office and will serve as our team's construction manager. He joined MSA in 2000 and has since been a key team member in design and construction of numerous complex public works projects. Bill managed MSA's work on the ODOT I-5 at Beltline Interchange Project in Springfield. MSA provided all utility coordination and utility relocation services for the project as well as stormwater analysis and the design of stormwater management facilities, including new stormwater detention/retention/water quality facilities. Bill provided ongoing construction support to ODOT construction staff throughout the construction phase of the Beltline project. Bill is currently overseeing the construction of MSA's sewer rehabilitation work for the City of Springfield.

Bill provided construction support services to ODOT construction staff for the first phase (4.5 miles) of the 11-mile long 3R (resurfacing, restoration and rehabilitation) project, which is part of ODOT's ongoing preservation of the 30-mile segment between Vancouver, Washington and Wilsonville, Oregon. Bill served as MSA's lead construction engineer on MSA's award-winning McMinnville Water and Light McGuire Reservoir Expansion project, ensuring strict compliance with all Oregon Water Resources Dam Safety requirements for construction quality control and documentation, as well as compliance with all DEQ, Corps of Engineers, ODF&W, NOAA, and other regulatory agency permit conditions. Bill also served as MSA's project manager for construction engineering on ODOT's Highway 47 rehabilitation project in Yamhill, Oregon. Bill oversaw and documented all required field testing and placement of construction materials on this project and responded to contractor requests for information, supervised MSA's field inspector and was the primary liaison between ODOT, the City of Yamhill, the contractor, Yamhill County, and the general public. He led and documented weekly construction meetings with the contractor, the City and other interested parties.

Mark Smith, an MSA staff engineer based in Springfield, will serve as field engineer during construction. Mark has overseen major construction work for the firm including dam work in the Oregon Coast Range; street and utility work for the City of Sheridan; sewer, water main, storm drainage, private utility and street/sidewalk construction for the City of Forest Grove; and pump station work for the City of Lake Oswego. He is currently assigned as MSA's field engineer on the firm's multi-phased City of Springfield sewer system rehabilitation project.

Jerry Lane, P.E., an OBEC principal engineer, will manage OBEC's work on the project, coordinating with MSA's project management team, and he will assist with traffic control planning. Jerry is familiar with the project area and the standards and expectations of the City of Springfield through OBEC's prior street work for the City.

Jim Colton, P.L.S., an OBEC survey group manager, will lead project surveying. Jim has managed the surveying for several City of Springfield projects.

Doug Appel, P.E. will assist with project permitting. Doug leads OBEC permitting group and is experienced with the permitting of similar projects in the area.

James Stupfel, an OBEC environmental specialist, will assist with environmental assessments and permitting.

Garrick Doll, an OBEC senior field engineering technician, will assist with pavement evaluations and construction inspection. Garrick has been involved in several City of Springfield and Eugene area street improvement projects.

Jim Maitland, P.E., principal/owner of Foundation Engineering, Inc. (FEI), will manage the geotechnical engineering for the project. Jim has managed FEI's work on other successful MSA projects and he is familiar with the project area. Jim's work on sewage systems

includes recent projects in the local area for Netarts, Oregon; Brownsville, Oregon; Corvallis, Oregon; Albany, Oregon; Junction City, Oregon; Lafayette, Oregon; Eugene, Oregon; Waldport, Oregon; Philomath, Oregon; and Monmouth, Oregon.

Leslie (Benckendorf) Finnigan, SR/WA will serve as task lead for right-of-way and easement acquisition-related work. Leslie is a property acquisition specialist with Universal Field Services, Inc. (UFS) who has spent the bulk of her career in the property acquisition field. She has managed similar work on numerous MSA public works projects, including assignments for the cities of Sherwood and Gresham, Oregon, and for Clean Water Services/Joint Water Commission, Clatsop County, the Oregon Department of Transportation (ODOT) and others.

David Collins, P.E., of David J. Collins Engineering, will assist with the upfront peer review of previous project planning, hydraulic modeling and alternative analyses. David has been highly involved with the City of Portland's CSO control program for the past several years. In this capacity, he has managed the City's Sanitary System Plan Update, developed system analysis software, conducted hydrologic/hydraulic analysis associated with both the Westside and Eastside CSO tunnel projects, and served as a technical advisor and reviewer on other major CSO projects. David has assisted MSA with similar technical advice and peer review on sewage system planning and design work for the City of Gresham. David is a recognized expert for SWMM modeling and CSO control system expert and his participation on our team is expected to offer important "added value" to the City of Springfield.

Personnel Resumes

Detailed resumes for key staff follow.

MSA

Personnel Resumes

Philip H. Smith, P.E., Founding Principal

Key Credentials

Education
BS in Civil Engineering, Washington State University
MS in Sanitary Engineering, Washington State University

Registration
Civil Engineer, States of Oregon, Washington & California
Environmental Engineer, State of Oregon
Certified Water Rights Examiner, State of Oregon

Professional Activities
American Society of Civil Engineers, President, Oregon Section, 1987-1988
American Water Works Association
Water Environment Federation
American Public Works Association
American Council of Engineering Companies (ACEC) – Oregon
Trustee, Pacific Northwest Consulting Engineers
Health & Welfare Trust, 1988 -1998
Evergreen Community Development Association, Loan Commitee
University of Portland Civil Engineering Department Industry Consulting Committee

37 Years of Experience

Career Summary

Mr. Smith has over three decades of experience in the planning, design and construction management of major public works projects in the Pacific Northwest. His experience includes planning and design of wastewater, stormwater, water, street and roadway projects, subsurface utility engineering (SUE) for transportation projects, and construction management of major utility and transportation projects of all types.

Experience Overview

Key Expertise: Wastewater & Stormwater Facility & Master Plans, Infiltration & Inflow Studies & Correction Programs, Wastewater & Stormwater Facilities Designs, Permitting & Construction Management, Pump Stations, Force Mains, Treatment Systems, Sewers, Vacuum Sewer Systems, Intergovernmental Agreements, Property Acquisition

Mr. Smith has served as project principal and project manager on many of the firm's major wastewater and stormwater facilities planning and design projects. Additional experience includes planning, design and construction management of major utility and transportation projects of all types. With his extensive background in highly complex projects, Mr. Smith provides key technical advice and guidance on projects with unique challenges and special issues.

Mr. Smith is currently serving as principal-in-charge for MSA's sanitary sewer rehabilitation project for the City of Springfield, Oregon. This project involves the rehabilitation and/or replacement of approximately 35,000 feet of 8-inch to 42-inch diameter sewer mains.

Mr. Smith served as principal-in-charge of the preliminary design of the Central City Interceptor Sewer Improvements (Sewer "K") for the City of Everett, Washington. The City's comprehensive sewer plan recommended paralleling of the upper two miles of the 36-inch to 48-inch diameter interceptor sewer to increase its capacity. Mr. Smith managed a team that reviewed alternatives to paralleling the entire system in the highly congested corridor and performed a condition assessment of the existing sewer. Mr. Smith was senior technical advisor to the project team during the final design of the recommended improvements through the two-mile corridor.

Mr. Smith served as a senior technical advisor on the City of Gresham's Sewer Trunk Improvements, Phase 1, which improved trunk capacity to the City's wastewater treatment plant (WWTP) through construction of a new trunk sewer between I-5 and the plant. Mr. Smith has been project principal on many sewage pump station projects, including the Willamette Lift Station for the City of Lake Oswego, which serves a significant portion of the City.

Mr. Smith served in a senior technical advisory role in the final design of the Miles Crossing Vacuum Sewer System project for the Miles Crossing Sanitary Sewer District near Astoria, Oregon. The $8 million project,

funded by the Rural Utilities Service and the State of Oregon Economic Development Department, will collect sewage in the service area using vacuum sewer technology. Through an intergovernmental agreement (IGA), the collected sewage will be transmitted to the City of Astoria's sewer system for treatment through a force main installed beneath Youngs Bay using horizontal directional drilling techniques.

Mr. Smith managed final designs for the City of Portland Bureau of Environmental Services (BES) -- Royal Highlands Pumping Station and Gravity Sewer/Force main project in addition to several elements of the firm's "Contract F" project work for BES. Mr. Smith was project manager on a sanitary sewer extension project for the City of Lake Oswego. He was also responsible for the planning and design of several major gravity sewer and sanitary sewerage force main projects as part of the Tri-City Service District's major improvement program for the cities of West Linn, Oregon City and Gladstone.

Mr. Smith was involved in a senior technical advisory role and performed QA/QC for both the City of Salem's North River Road CSO Diversion Structure project and the Oregon State Department of Correction's Oregon State Correctional Institution (OSCI) Phase 2 Sewer Improvements project.

Mr. Smith was responsible for completing the City of Gaston Sanitary Sewerage Facilities Plan for Clean Water Services of Washington County, Oregon in addition to the follow-up planning and design of pumping and force main improvements which provided for the transmission of raw sewage seven miles to the USA/Forest Grove Treatment Facility.

Mr. Smith has served as project principal on recent wastewater master plans for the cities of Wood Village, Sheridan and Dundee. All of these plans have included infiltration and inflow (I&I) analysis and development of I&I reduction programs. He also was project manager for an analysis of sewage transmission alternatives for the City of Wood Village. The Sheridan and Dundee projects involved treated wastewater effluent reuse.

Mr. Smith managed a major sewerage system improvements project for the City of Newberg, Oregon that included a facilities plan, I&I study, sewer system evaluation survey, and final design for sewer system rehabilitation, interceptors and pumping station improvements. He completed a storm water management plan for Woodburn, Oregon, was a design team member for the City of Redmond, Oregon and the Netarts-Oceanside Sanitary District sewage treatment plants, and was project manager for the City of Prineville, Oregon's Lagoon Effluent Disposal Facilities Plan.

Mr. Smith managed the construction administration for major improvements to the City of Astoria, Oregon's sewerage system, which included an interceptor sewer, five pumping stations and a treatment facility. He was a study/design team member on numerous other projects, including the Comprehensive Sewerage Master Plan for Jackson and Josephine counties, Oregon and the Hiteon Trunk for Clean Water Services, Washington County, Oregon.

Mr. Smith's storm drainage experience has included: storm drainage master plans for the cities of West Linn, Woodburn, and Forest Grove; the 12-foot diameter, 1,250-foot long Hess Creek Drainage Tunnel for Publishers Paper Co., Newberg; the Autumn View Court, Cedaroak/Kenthorpe and the Wilderness Drive storm sewer projects for the City of West Linn; drainage facility designs at numerous electrical substations for the Bonneville Power Administration; a hydrological study of the North Fork of the Bull Run River for the Portland Water Bureau; a hydraulic analysis of Mill Creek for a hospital in Salem; a groundwater and drainage study in the Laughlin area for the City of Prineville; and numerous flood plain, drainage hazard area and storm water retention analyses for various clients in Washington County, Oregon.

Mr. Smith managed the planning and design of a 1/4-mile long soft-ground tunnel for Publishers Paper Co. (now SP Newsprint Co.) at its newsprint mill in Newberg, Oregon. The tunnel carries Hess Creek through a hill adjacent to its original course. MSA assisted the owner with a tunnel contractor selection process during project design. The selection criteria included construction means and methods, tunnel boring machine (TBM)

availability and suitability, ability to mobilize and meet the fast-track schedule, prior experience in similar ground conditions, estimated cost and other factors. The tunnel was constructed using a soft-ground TBM that drove a 12-foot diameter hole behind which was installed a primary tunnel liner consisting of circular steel rib sets with wood lagging. Inlet and outlet structures and channels were constructed to complete the project. The tunnel was finished with a cast-in-place concrete liner.

Key Project Experience

- Sanitary Sewer Rehabilitation, City of Springfield, Oregon
- Miles Crossing Vacuum Sewer System Project, Miles Crossing Sanitary Sewer District, Clatsop County, Oregon
- Trojan Nuclear Plant and Trojan Park On-Site Wastewater Facilities, Portland General Electric, Oregon
- Bay View State Park Wastewater Management Plan, Washington State Parks and Recreation Commission
- Wastewater Facilities Plan, City of Wood Village, Oregon
- Wastewater Facility Plan, City of Sheridan, Oregon
- Wastewater Facility Plan, City of Dundee, Oregon
- Sewage Transmission Study, City of Wood Village, Oregon
- Hayden Island Sanitary Sewer Facilities Plan, City of Portland, Oregon
- Sanitary Sewer Master Plan, City of Hillsboro, Oregon
- Sewerage Facility and Financial Master Plan, City of West Linn, Oregon
- South Rivergate Industrial District, Sanitary Sewer Master Plan, Port of Portland, Oregon
- City of Gaston Sewerage Facilities Plan and Gaston/Forest Grove Pump Station and Force Main, Clean Water Services, Washington County, Oregon
- Royal Highlands Interceptor Sewer Facilities Plan and Pump Station and Force Main Design, City of Portland, Oregon
- Facility Plan, I&I Study, Sewer System Evaluation Survey and Final Designs for Sewer Rehabilitation, Interceptors and Pumping Stations, City of Newberg, Oregon
- Central City Interceptor Capacity Upgrade, City of Everett, Washington
- Sewer Trunk Improvement, Phase 1, City of Gresham, Oregon
- Willamette Lift Station, City of Lake Oswego, Oregon
- Sullivan Pressure Line Replacement, Hayden Island Sanitary Sewer Replacement, and NE 62nd and Hancock Sewer Relief, City of Portland, Oregon
- 1996/97 Fiscal Year Annual Sanitary Sewer Extension Projects, City of Lake Oswego, Oregon
- N.E. 62nd and Hancock Sewer Separation Project/Lents Basin CSO Project/N.E. Wisteria, N.E. 41st Avenue & N.E. 54th Avenue Sewer Reconstruction/Contract F Gravity Sewer and Force Main Improvements, City of Portland, Bureau of Environmental Services, Oregon
- West Linn Gravity Sewer and Force Main/Bolton Street Force Main/ River Street Force Main, Tri-City Service District, Clackamas County, Oregon
- OSCI Phase 2 Sanitary Sewer Improvements, State Department of Corrections, Salem, Oregon
- North River Road CSO Diversion Structure, City of Salem, Oregon
- Scouters Mountain On-Site Disposal System, Boy Scouts of America
- Scoggins Valley Road Mill On-Site Disposal System, Stimson Lumber Company
- Storm Drainage Master Plan, City of West Linn, Oregon
- Storm Drainage Master Plan, City of Forest Grove, Oregon
- Storm Drainage Master Plan, City of Woodburn, Oregon

James L. Helton, P.E., Senior Vice President

Key Credentials

Education
BS in Civil Engineering, Gonzaga University
Graduate Studies, Portland State University

Registration
Registered Civil Engineer in the States of Oregon & Washington
Registered Environmental Engineer, Oregon
Certified Water Right Examiner, Oregon

Professional Activities
American Society of Civil Engineers
American Water Works Association
Water Environment Federation
Construction Specifications Institute
Trustee, Pacific Northwest Consulting Engineers Health & Welfare Trust

34 Years of Experience

Career Summary

Mr. Helton joined Murray, Smith & Associates, Inc. (MSA) as a senior engineer in 1994 after serving as project engineer and principal engineer with Cunningham Associates, Inc. for 19 years. He is experienced in all facets of civil engineering for public works projects, project administration, project management, project programming, quality assurance, standards development, environmental, land-use permitting, coordination with government agencies and grant and loan programs. Mr. Helton was named a senior vice president of the firm in 2008.

Experience Overview

Key Expertise (Wastewater & Stormwater): Wastewater & Stormwater System Planning & Analysis, Stormwater Treatment & Pump Station Design, Wastewater Treatment/Storage/Pump Station/Piping/On-Site Systems/Water Reclamation/Reuse/Disposal/Biosolids -- Planning, Analysis, Siting, Design & Construction Management, Permitting, Instrumentation & Control Systems, New Facilities & Remodels, Computer Hydraulic & Hydrologic Modeling, Quality Assurance/Quality Control

Mr. Helton has extensive experience in the planning and design of all components of sanitary sewage and storm drainage systems. He has prepared master plans, facilities plans, predesign studies and final designs and has managed many multi-million dollar construction projects. His experience includes permitting of complex and environmentally sensitive projects and working with small communities to obtain project financing from federal and state funding agencies. His project planning and designs have included multiple reuse water systems, conversions of lagoon treatment to mechanical treatment systems and outfall improvements. Specifically, his projects include major sanitary sewer, storm sewer, drainage and water resources projects for the cities of McMinnville, Milwaukie, Sheridan, Dundee and Portland, as well as for Clean Water Services (CWS), Peninsula Drainage District No. 2, the Corps of Engineers and several drainage districts in Cowlitz County, Washington. Also included are major sanitary sewer projects for Clackamas and Curry Counties; the City of Aberdeen, Washington; the cities of West Linn, Amity, and St. Paul, Oregon; and the Town of Cathlamet, Washington. His experience also includes hydraulic modeling, control system designs, specification writing, cost estimating and construction management.

Mr. Helton has managed wastewater facilities master plans for the cities of Sherwood, Sheridan and Dundee and for the Parkdale Sanitary District. Mr. Helton serves as the Parkdale Sanitary District's District Engineer. He currently manages MSA's flexible services contract work for CWS where the firm has completed numerous sewage pump station designs, wastewater treatment and pipeline designs. The CWS twin 24-inch diameter treated wastewater effluent "purple pipe" conveyance system between the CWS Forest Grove Wastewater Treatment Plant and CWS's Rock Creek Wastewater Treatment Facility in Hillsboro enables multiple uses of treated effluent from CWS's three upper Tualatin Basin wastewater treatment plants. Mr. Helton is currently managing a phased rehabilitation program for this system. He also managed the firm's work (subconsultant to Otak) for the North Clark County Regional Conveyance System planning where MSA was responsible for preliminary pump station siting and predesign and preliminary force main hydraulic analysis.

Mr. Helton managed MSA's work (subconsultant to GeoEngineers) to assess the current surface water distribution system in order to provide recommendations to improve water management of the Lower Klamath Lake and Tule

Lake National Wildlife Refuges. His work included field investigations of existing water supply and drainage infrastructure within the refuges. The investigations included the inventory of over 350 hydraulic structures. Other work included system capacity analysis and developing computer-aided surface water management model using data from field investigations, topographic surveys and XPSWMM software. Mr. Helton created a water management plan that will aid the United States Fish & Wildlife Service (USFWS) in efficiently directing water through the refuge.

Mr. Helton has managed numerous sewage pump station projects, including emergency upgrade projects at Sherwood and the Hillsboro wastewater treatment plant for CWS; the River Road Pump Station for CWS; upgrades and expansions of the Pine Lodge, Rock Creek Ranch, Pleasant View, Nyberg, Gaston, River Road and Sherwood pump stations for CWS; the Lenox Pump Station for the City of Hillsboro; the Wilco Sewage Pump Station for the City of Stayton; the Brookside Sewage Pump Station reconstruction for the City of Milwaukie; the West Columbia Sewage Pump Station upgrade for the City of Troutdale; the Willamette Lift Station upgrade for the City of Lake Oswego; and the Amanda, Hilltop, Settlers Point and Pease Road pump stations for the City of Oregon City. MSA's Schedule B River Road Pump Station work included the designs for modification of CWS's twin 24-inch treated effluent reuse pipelines and the extension of reuse pipelines for local area irrigation purposes. He has also managed MSA's design review services for CWS for developer pump station designs and managed the updating of CWS's sewage pump station design standards. Mr. Helton is MSA's project manager and principal-in-charge of the firm's three-year master agreement with CWS for medium-sized projects.

Mr. Helton managed a major $10 million public facilities and final design engineering planning and design project, as well as the construction management services for extending City sewer and water service along State Route 105 to a new 2,000-bed State correctional facility located approximately six miles southwest of the City of Aberdeen, Washington. Mr. Helton successfully coordinated with numerous local, state and federal agencies for wetlands design and construction of facilities through wetlands. Final designs were completed for approximately 32,000 feet of 12-inch diameter sewage force main, approximately 30,000 feet of 10-inch and 12-inch diameter water piping, and approximately 23,000 feet of 4-inch diameter welded steel natural gas piping, including six creek crossings using directional drilling techniques. Mr. Helton also led the design of a sewage pumping station and two water pumping stations, in addition to a 1.5-million gallon (mg) reinforced concrete emergency sewage storage tank.

Mr. Helton directed the facilities planning and design of a new outfall on the South Yamhill River and outfall piping from the wastewater treatment plant for the City of Sheridan. The project included obtaining US Army Corps of Engineers (COE) and Division of State Lands (DSL) permits for working in the river and permits for cased crossings of a state highway and regional railroad line.

Mr. Helton was also the principal engineer for a facilities plan update and anaerobic digester addition for the City of Aberdeen, Washington. This study included updating projected population and sewage flows to the Aberdeen Wastewater Treatment Plant, analyzing alternate sludge treatment and disposal schemes, and developing cost estimates for the alternates. Design of a 0.6-mg anaerobic digester and digester control building, including sludge pumps, piping, mixing, heating, control and cogeneration systems, was accomplished. The effluent disinfection system was also evaluated. Control changes were designed to optimize the chlorine feed and dechlorination equipment was installed.

Mr. Helton designed a major storm drainage project for the treatment, detention and conveyance of stormwater from a drainage basin in the City of Milwaukie, Oregon. A two-acre, non-discharging pond was converted to a treatment/detention facility with controlled discharge while maintaining its status as a wetland area. Treatment consisted of oil/water separation, filtering, settling basin and biological action. A large diameter outlet was designed to carry the treated effluent approximately 2,000 feet under a principal railroad line and a state highway to Johnson Creek.

James L. Helton, P.E., Senior Vice President

Mr. Helton completed sewerage system studies for the Willamette area of West Linn and planned and designed collector sewers and the Tualatin Interceptor for service to this area of the City. He also completed sewerage planning studies and design engineering for Clackamas County, Oregon for sewer service to the City of Boring.

Mr. Helton designed pollution control projects for St. Paul, Oregon and Cathlamet, Washington. The projects consisted of complete community sewer systems and treatment plants, including gravity sewers, sewage lift stations, and separation of sanitary sewer and storm drains.

The water delivery system for the NE Airport Way wetland mitigation project for the City of Portland, Oregon was designed by Mr. Helton. The design included a pump station and transmission line to a series of man-made ponds, inlet water measurement and distribution facilities and outlet structures with adjustable weirs for varying water level in the ponds to simulate seasonal fluctuations.

In addition, Mr. Helton has designed numerous flood control pump stations for drainage districts in Longview and Kelso, Washington, the Beaver Drainage District near Clatskanie, Oregon, and Peninsula Drainage District No. 2 in Portland, Oregon. Individual pumps have ranged in capacity from 75,000 gallons per minute (gpm) with total station capacities to 150,000 gpm.

Key Project Experience

- Sanitary Sewer Master Plan, City of Sherwood, Oregon
- Wastewater Facilities Plan Amendment (Including Reuse), City of Dundee, Oregon
- Wastewater Facilities Plan and Treatment Plant Capacity Study (Including Reuse), City of Sheridan, Oregon
- Cape Lookout State Park Sanitary Sewer System Improvements, State of Oregon Parks and Recreation Department
- Sherwood Wastewater Pumping Station Emergency Repairs and Upgrades, Clean Water Services, Washington County, Oregon
- Bay View State Park Wastewater Management Plan (Including Reuse), Washington State Parks and Recreation Commission
- Trojan Nuclear Plant and Trojan Park On-Site Wastewater Facilities, Portland General Electric, Oregon
- River Road Pump Station and Force Main (Including Reuse), Clean Water Services, Washington County, Oregon
- Willamette Lift Station Upgrade, City of Lake Oswego, Oregon
- Hillsboro WWTP Influent Pump Station Emergency Upgrade, Clean Water Services, Washington County, Oregon
- Utilities Extension to State Correctional Facility, City of Aberdeen, Washington
- Updating of Sewage Pump Station Standards, Clean Water Services, Washington County, Oregon (ongoing)
- Developer Pump Station Plan Review Services, Clean Water Services, Washington County, Oregon
- Sanitary Sewage Lift Station Replacement Project, City of Oregon City, Oregon
- Pease Rd. Sewage Lift Station Replacement Project, City of Oregon City, Oregon
- Distribution and Drainage System Assessment, Lower Klamath National Wildlife Refuge, United States Fish & Wildlife Service
- Design of Five Drainage and Flood Control Pump Stations, Longview/ Kelso Area, Washington
- Wastewater Facilities Plan, Parkdale Sanitary District, Parkdale, Oregon
- Update on Drainage Facilities and Requirements, Consolidated Diking Improvement District No. 1, City of Longview, Washington
- Drainage and Flood Control Improvements, Consolidated Diking Improvement District No. 1, City of Longview, Washington
- City of Boring Sewerage Facilities Plan and Improvements Design, Clackamas County, Oregon
- Storm Drainage Facilities at Ochoco Street, City of Milwaukie, Oregon
- Drainage Basin Modeling and Report on Pumping Requirements, Sandy Drainage District, Multnomah County, Oregon
- Twin 24-inch Force Mains Corrosion Improvements, Clean Water Services, Washington County, Oregon
- North County Regional Conveyance System Planning, Clark County, Washington
- Cornelius Pump Station Odor Control Improvements, Clean Water Services, Washington County, Oregon
- Pine Lodge, Rock Creek Ranch and Nyberg Pump Station Upgrades, Clean Water Services, Oregon
- Wastewater Treatment Alternative Analysis, City of Dundee, Oregon

Kyle P. McTeague, P.E., Principal Engineer

Key Credentials

Education
BS in Civil Engineering, Portland State University

Registration
Civil Engineer, State of Oregon

Professional Activities
American Society of Civil Engineers
American Water Works Association
American Public Works Association

20 Years of Experience

Career Summary

Mr. McTeague, a principal engineer with Murray, Smith & Associates, Inc. (MSA), has served in a variety of engineering, planning, design and construction administration roles. Mr. McTeague's engineering experience includes comprehensive facilities planning and extensive multi-agency, multi-discipline design and construction administration. He is currently serving as MSA's representative as City Engineer for the City of North Plains, Oregon, in addition to managing various ongoing projects.

Experience Overview

Key Expertise (Wastewater & Stormwater): Storm Drainage and Sanitary Sewer System Planning & Design, Utility Coordination, Special Drainage Systems & Yard Piping, Valving, Metering and Flow Control Systems, Corrosion Control Systems

Mr. McTeague is currently managing a major collection sewer upgrade program for the City of Springfield, Oregon. This project includes the rehabilitation or replacement of approximately 35,000 feet of 8-inch to 42-inch diameter sewer mains.

Mr. McTeague completed the planning and design of the OSCI Phase II Sewer Improvements project for the Oregon State Department of Corrections, a joint project with the cities of Salem and Turner involving approximately two miles of 18-inch through 36-inch diameter sewer. The project, complicated by creek, wetlands, highway, freeway and railroad crossings, required extensive evaluation of various routing alternatives and involved the development and documentation of a detailed three-party cost-sharing program in support of two City/department intergovernmental agreements for "common" construction.

Mr. McTeague completed planning and design of a sanitary sewer project for the City of Lake Oswego, Oregon which involves approximately 5,500 feet of 6-inch and 8-inch sanitary sewer mains. Design entailed sewer routing through a designated natural area requiring specifying special environmentally sensitive construction methods and replanting procedures.

Mr. McTeague served as project engineer on the firm's Benchview Court Storm Drainage and Sanitary Sewer Improvements work for the City of Tigard, Oregon. This engineering was in response to an emergency landslide situation and required careful coordination with the City's legal council, geotechnical engineering subconsultant and the private contractor responsible for construction.

Mr. McTeague completed sub-basin hydraulic/hydrologic analysis and final design of storm drainage improvements for the Oak Lodge Sanitary District's Dogwood Lane neighborhood, a project that included special surface water pollution reduction features. He has also served as project engineer on many of the firm's storm drainage engineering assignments as part of the firm's ongoing City Engineer assignment for the City of King City.

Mr. McTeague has served as project engineer on several of the firm's most recent projects for the City of Portland, Bureau of Environmental Services (BES). Both the Lents Basin CSO Abatement project and the NE 63rd Avenue Trunk Sewer project included storm drainage subbasin hydrologic/hydraulic analysis as part of storm drainage separations designs.

Kyle P. McTeague, P.E., Principal Engineer

Mr. McTeague also played a key role in the recent stormwater master plan for the City of St. Helen's, the storm drainage master plan for the City of King City, and the water system master plan update for the City of Forest Grove.

Key Project Experience

- Sanitary Sewer Rehabilitation, City of Springfield, Oregon
- Storm Drainage Master Plan, City of King City, Oregon
- Stormwater Master Plan, City of St. Helens, Oregon
- McGuire Reservoir Expansion, Supplementary Environmental Mitigation, McMinnville Water & Light, Oregon
- Oregon State Correctional Institution, Sanitary Sewerage System Improvements, Phase II, Oregon State Department of Corrections, Salem, Oregon
- 1996/97 Sanitary Sewer Extensions Project, City of Lake Oswego
- Benchview Terrace Storm Drainage, Street and Sanitary Sewer Rehabilitation, City of Tigard, Oregon
- Dogwood Lane Storm Drainage Improvements, Oak Lodge Sanitary District, Milwaukie, Oregon
- Lents Basin CSO Abatement Project, Bureau of Environmental Services, City of Portland, Oregon
- Naef Road Storm Drainage Improvements, Oak Lodge Sanitary District, Clackamas County, Oregon.
- South Airport Basin Sewerage Facilities Plan and Trunk Sewer Predesign, Bureau of Environmental Services, City of Portland, Oregon
- Dogwood Lane Storm Drainage Improvements, Oak Lodge Sanitary District, Clackamas County, Oregon

Matt L. Hickey, P.E., Principal Engineer

Key Credentials

Education
BS in Civil Engineering, University of Portland

Registration
Civil Engineer, State of Oregon

Professional Activities
American Water Works Association
American Society of Civil Engineers

17 Years of Experience

Career Summary

Mr. Hickey joined Murray, Smith & Associates, Inc. (MSA) in July 1993 after working with the City of Portland, Bureau of Environmental Services (BES), and since that time has completed engineering, design and construction administration on a variety of complex water, sewerage, drainage and street projects. Mr. Hickey was named a firm principal engineer in 2008.

Experience Overview

Key Expertise: Wastewater & Stormwater Basin Planning, CSO Control Hydraulic & Hydrologic Analysis, Gravity Sewer & Force Main Design, Wastewater Pump Stations, Wastewater Facilities Plans, I&I Studies & Analysis, Wastewater Facility Designs, Pump Stations, Trenchless Technologies, Stormwater System Planning, Construction Management

Mr. Hickey is currently serving as a project manager for the City of Gresham, Jenne Road – Pleasant Valley Interceptor Sewer project. MSA prepared permit applications for the Corps of Engineers/DSL 404 wetland permit, NOAA fisheries permit and the City of Gresham Water Quality Resource Area (WQRA) permit for the creek crossing work, additionally assisting the City with the City of Portland Parks Bureau permit for work in the Springwater Trail Linear Park. MSA's work also included developing a traffic control and detour plan for closure of SE Jenne Road and approval through the City of Portland and Multnomah County transportation departments. MSA assisted the City with interceptor design and completed designs for an inverted sewer crossing of Johnson Creek. Engineering included the evaluation of the upstream sewage basins and sizing of pipes appropriately to convey build-out flows in the Pleasant Valley Area. Design challenges involved deep sewer piping up to 20 feet deep in SE Jenne Road and coordination with various agencies relative to conflicts with existing utilities.

Mr. Hickey performed a key engineering role on a number of storm and sanitary sewer projects including the Washington Park Sinkhole Remediation and Storm Sewer Upgrades for the City of Portland Water Bureau, the South Central Beaverton Utility Improvements for the City of Beaverton, and the Johnson Creek Boulevard Sanitary Sewer and Brookside Pump Station Abandonment for the City of Milwaukie. Mr. Hickey was the design engineer for the Sellwood Sewer Unit 3 (Garthwick) Sewer Improvements for the BES.

Mr. Hickey recently served as project engineer on the City of Gresham Wastewater Services Trunk Sewer project. This multi-phased project was designed to relieve current and anticipated future surcharging of an existing 42-inch diameter trunk sewer and included capacity modeling and route alternatives analysis through congested corridors. The design included 12,000 feet of 36-inch to 54-inch diameter trunk sewer, flow diversion structures, permitting, relocation of private utilities and easement acquisitions.

Mr. Hickey served as MSA's project manager for the City of Wood Village Wastewater Master Plan and Inflow and Infiltration project. He has completed a sewage transmission and routing study predesign report and design of 7,500 feet of 18-inch to 27-inch gravity transmission line to the Gresham Wastewater Treatment Plant for the City of Wood Village. The project included a bored and cased railroad crossing, permitting with multiple jurisdictions along the pipe route, flow metering, and telemetry. Mr. Hickey is project manager for the City of Wood Village Alternative 4 predesign, design and construction, which includes a force main, a new pump station and a pressure gravity sewer.

Matt L. Hickey, P.E., Principal Engineer

Mr. Hickey has served as design engineer on other projects involving storm drainage detention and treatment design with various agencies. Projects with the cities of Portland and Tigard have included storm drainage modeling and pipe sizing for developed project sites. Designs included storm water quality facilities, evaluating down stream receiving streams, addressing Department of Environmental Quality (DEQ) discharge regulations, obtaining permits from the BES and permitting and design reviews through Clean Water Services (CWS).

As City Engineer for the City of Columbia City, Mr. Hickey as developed a master plan for new UGB areas annexed into the City, including capacity analyses of existing water, sewer and stormwater systems relative to anticipated development. Mr. Hickey has prepared the City's System Development Change and Capital Improvement Plan Update for Sanitary Sewer and Water Systems and prepared the City's Storm Water Management Plan for UIC Systems, which included inventorying and modeling the City's existing stormwater drainage system and associated drywells to meet DEQ requirements. Mr. Hickey has evaluated the City's existing sanitary sewage collection system and pump stations for capacity relative to impacts from residential and commericial growth in the City and hydrogen sulfide production. Additionally, he evaluated and designed portions of the City's storm drainage system.

Mr. Hickey is experienced with pipe bursting, cased railroad under-crossings and diversion structures. Mr. Hickey performed a key engineering role on other sewer projects including the Washington Park Sinkhole Remediation, the Storm Sewer Upgrades for the City of Portland Water Bureau, and the South Central Beaverton Utility Improvements for the City of Beaverton.

Mr. Hickey has also performed a key engineering role on several utility modification and improvement projects required by the Oregon Department of Transportation (ODOT)/TriMet Westside Corridor (Lightrail and Highway 26 Improvements) Project. These projects included 18-, 24- and 54-inch piping, cased pipeline roadway and highway crossings, and pipeline bridge crossings. Successful completion of these projects has required the close coordination with clients, TriMet, ODOT, business and property owners, the project contractor, and other utility contractors working in the area.

Mr. Hickey as MSA's project engineer role on the Miles Crossing Sanitary Sewer District Vacuum Sewer Improvements for Clatsop County. This project included a new vacuum sewer system, a new pump station and a directionally-drilled crossing of Youngs Bay.

Key Project Experience

- Jenne Road – Pleasant Valley Interceptor Sewer Project, City of Gresham, Oregon
- Sanitary Sewer Capital Improvements: Fourth Street to Willamette Falls Drive, City of West Linn, Oregon
- Miles Crossing Sanitary Sewer District Vacuum Sewer System Improvements, Clatsop County, Oregon
- Washington Park Sinkhole Remediation and Storm Sewer Upgrades, City of Portland Water Bureau, Oregon
- NE Fairview Avenue and NE Sandy Boulevard Sanitary Sewer, City of Wood Village, Oregon
- Garthwick Combined Sewer Project, Bureau of Environmental Services, City of Portland, Oregon
- Wastewater Services Sewer Trunk Design, City of Gresham, Oregon
- Wastewater Master Plan and Inflow and Infiltration Study, City of Wood Village, Oregon
- Kelly Creek Gravity Sewer Feasibility Analysis, City of Gresham, Oregon
- Alternative 4 Sewer System Improvements, City of Wood Village, Oregon
- Johnson Creek Boulevard Sanitary Sewer and Abandonment, City of Milwaukie, Oregon
- South Central Beaverton Utility Improvements, City of Beaverton, Oregon
- On-site stormwater quality treatment facilities for various public agencies:
  - City of Fairview, Oregon
  - City of Tigard, Oregon
  - City of Portland, Oregon
  - City of Oregon City, Oregon

David E. Stangel, P.E., Managing Principal

Key Credentials

Education
MS in Water Resource Engineering, Oregon State University
BS in Geography, Oregon State University

Registration
Civil Engineer, States of Idaho, Oregon & Washington

Professional Activities
American Water Works Association
Water For People
American Public Works Association
American Council of Engineering Companies

15 Years of Experience

Career Summary

Mr. Stangel provides over 15 years of engineering experience and offers highly specialized qualifications and expertise in hydraulic modeling and GIS applications. Mr. Stangel specializes in master planning of water and wastewater systems and has been involved with more than 60 such projects as project manager, senior reviewer and project engineer. He is experienced with a wide array of hydraulic modeling and database tools and routinely leverages available GIS-based data into hydraulic modeling formats and planning documents. His project experience includes work for clients throughout the Pacific Northwest, the United States and abroad.

Experience Overview

Key Expertise: Integrated Water System Planning; Water Master Planning; Hydraulic Modeling & Water Distribution System Analysis; Water Management & Conservation Plans; Wastewater Conveyance Planning; Collection System Analysis/Basin Modeling; GIS Applications; Programs: InfoWater, H2OMap, H2ONet, WaterCad, EPANet, InfoSWMM, ArcGIS

Mr. Stangel is currently assisting Asotin County PUD in support of their water system hydraulic modeling program and other planning initiatives. Recent work assignments include assisting the PUD in evaluating modeling software and then subsequently converting their model to H2OMap. The model conversion included adding recently constructed facilities as well as ensuring that both existing and future modeling scenarios operated correctly. Training in the use of the software was also provided to PUD staff over a period of two days, allowing the PUD to operate the model in-house for evaluations of fire flow and new development.

Mr. Stangel assisted the City of The Dalles, Oregon in evaluating the water system under current and future conditions. This analysis included identifying the need for new reservoirs, supply and pumping, and the potential locations for those facilities. Mr. Stangel also provided City staff a two-day training course on the use of the hydraulic model. The training included instruction on how to use the software, update the model and perform fire flow and improvement analysis.

Mr. Stangel served as project manager on the Comprehensive Water System Study for the Mountain Home Air Force Base in Mountain Home, Idaho. The study focused on ensuring adequate water infrastructure would be in place to provide service for at least 50 years. The primary areas of focus for the study were condition assessment, hydraulic modeling and source of supply. Hydraulic model construction, calibration and analysis was performed to assess the hydraulic capacity of the system, and a Capital Improvements Plan was developed to allow the Base to continue to provide adequate, high-quality water in the future.

Mr. Stangel was project manager of the Water System Master Plan Update for the City of Meridian, Idaho, a growing community of approximately 60,000. The plan included evaluating water system hydraulics, modeling of system improvements for future growth areas outside the city's urban growth boundary, producing a 20-year projected Capital Improvements Plan, and evaluating options for financing future improvements.

David E. Stangel, P.E., Managing Principal

Mr. Stangel served as senior reviewer for the City of Ontario, Oregon Hydraulic Analysis. This project focused on evaluating operational changes to the City's system. Analysis recommended the removal of one of the City's pressure zones, which simplified system operations and reduced maintenance associated with the eliminated PRV stations.

Mr. Stangel served as project manager for the Collection System Model Development and Capital Improvement Plan Development for the City of Twin Falls, Idaho. The project included creating a model network from a combination of available electronic and hard copy data including as-builts, calibrating that model to field collected flow measurements and providing an existing and future Capital Improvements Plan.

As task lead/GIS coordinator on the Hydraulic Computer Model for the Sanitary and Combined Sewer System for the City of Everett, Washington, Mr. Stangel coordinated GIS to develop a hydraulic computer model for analysis of the sanitary and combined sewer system. The City had a large existing ArcInfo database of Coverages and Shapefiles. This information was processed using a series of QA/QC steps to ensure attribute completeness, accuracy and correct topology in many areas where pipes were not connected properly or had been digitized in the wrong direction. This project required significant coordination to establish a readily maintainable, one-way transfer of sewer system data from the City's ArcInfo GIS to the hydraulic model.

Mr. Stangel served as project manager for the General Sewer Plan Update for the City of Mercer Island, Washington, and was responsible for general coordination and Capital Improvement Plan coordination. Hydraulic models of the City's central business district and lake line were developed to evaluate existing and future growth scenarios, and a plan was developed and submitted to DOE in less than one year. A primary project component was a collection system hydraulic model built from the City's Geodatabase. This effort required significant clean-up of the City's data for use in the hydraulic model. Errors or omissions in the data were fixed and the corrected information was returned to the City for incorporation into the master Waste Water System Geodatabase.

Mr. Stangel served as task lead on the Water System Master Plan Update and reservoir predesign for the City of Tualatin, Oregon, a growing community of approximately 21,000. The plan included evaluating water system hydraulics, using state-of-the-art modeling tools and procedures, including dynamic simulation, to evaluate the ability to fill and drain the proposed reservoir based on various capital improvements and operating scenarios. The dynamic simulation modeling included developing diurnal demand curves and loading operational data in order to simulate actual system operation over a period of 48 to 72 hours. Recent work has been done to assist the City in submitting a Stage 2 DBP Rule IDSE Plan using the SSS modeling option.

Mr. Stangel has been working as project manager for the Snohomish County Public Utility Department (PUD) in support of their geodatabase construction and hydraulic model since 2003. This work originally included developing an updated hydraulic model from GIS data. The model was then calibrated and used to update the Capital Improvements Program for the PUD. The most recent work involved preparing a Stage 2 DBP Rule IDSE Plan using the SSS option with the PUD's hydraulic model.

Mr. Stangel served as task lead for the hydraulic analysis portion of the City of Redmond, Oregon's Water and Wastewater Master Plan. The project included developing a new hydraulic model from available GIS data, calibrating that model and evaluating existing and future scenarios. The significant growth that Redmond is experiencing, in addition to a large urban growth boundary, required an evaluation that included identification of the large diameter distribution and collection grid for growth in the next 50 years.

Mr. Stangel provided senior level guidance to the City of Spokane, Washington to construct an all-pipe dynamic hydraulic model for their distribution system. The project entails four key tasks: 1) model construction from an existing ESRI Geodatabase structure including all pipes (16,000-18,000 pipes) with the exception of service and hydrant laterals, 2) demand allocation by parcel using existing billing records geo-located and referenced to demand nodes, 3) steady state and dynamic calibration including 4-6 weeks of field pressure and 4) flow measurements and ongoing model maintenance coordinated with the City's GIS database. Project work also included training for City staff in the use of the hydraulic modeling software.

David E. Stangel, P.E., Managing Principal

Mr. Stangel has been working with the City of Winter Park, Florida since 2000 as project manager in support of their water planning and modeling. This work has included updating and calibrating the model and developing a distribution system Capital Improvements Plan. Winter Park chose to submit a Stage 2 DBP Rule IDSE Plan using the SSS modeling option which Mr. Stangel prepared and submitted to the EPA.

Mr. Stangel has been supporting Washington's Sammamish Plateau Water and Sewer District in modeling, planning and design for their water system since early 1999. The work began as part of a master plan update where Mr. Stangel was responsible for updating their existing hydraulic model to H2OMap from an older format and incorporating newly available GIS data. The update included a field data collection effort to calibrate the model. The model was then used to identify and phase capital improvements through build-out. Ongoing work includes source of supply alternative analysis and advancing model development to include extended period, water quality modeling and the development of a unidirectional flushing program.

Mr. Stangel served as task lead for the construction of an extended period model to help site future reservoir and pump station facilities for the completion of the Water System Master Plan for the City of Waco, Texas. Diurnal demand information was developed from available SCADA records. The extended period simulations also helped define operational settings for many pump stations that had historically been operated manually. The ultimate product of the hydraulic analysis was a Capital Improvements Program used to assure that the water system infrastructure can provide for future growth.

Mr. Stangel worked as task lead on a water infrastructure improvement project for the Commonwealth of Puerto Rico, including Water Master Plan development, synthesis of hydraulic models from existing hard copy maps and field verification for a portion of the island serving approximately 250,000 people. Identification of water distribution system improvements including pipes, pump stations, reservoirs and valves for current and year 2020 scenarios included approximately $45 million worth of hydraulic improvements to be constructed on a 2-year schedule. Acquisition of existing and new GIS data sources for use in model development included registered satellite and aerial photography.

As project engineer, Mr. Stangel worked on the Water Distribution System Conversion and Modeling project for the City of Phoenix, Arizona. The project included reduction of over 1 million GIS water pipes into a skeletonized system of 50,000 pipes of 6 inches in diameter and greater. Work also included conversion of a filtered system into CAD format while maintaining attribute information for all features. GIS-based land use and population coverages, combined with Thiessen procedures, were used to calculate water demands as input to hydraulic modeling.

Mr. Stangel served as the project manager for the City of Bend, Oregon Sewer Collection System Model and Capital Plan. The project includes a storm frequency analysis, network review, model calibration, hydraulic analysis of system deficiencies and improvements, Capital Improvement analysis through 2030. The model has been set-up to incorporate both dry weather flows and system response to infiltration and inflow. The modeling effort provides system improvements and costs for both conveyance and pumping capacity. The model platform is INFOSWMM with the EPASWMM hydraulic engine. The project culminated in the identification of improvements for major interceptor lines in the City's system for 20 year and build-out conditions.

Mr. Stangel served as a project manager for the City of Meridian, Idaho Sewer Collection System Hydraulic Model conversion. The model was converted from HYDRA to EPASWMM and provided a validation of the existing model and training on the use of EPASWMM.

As Project Engineer, Mr. Stangel worked on Water and Wastewater System Design Project for the City of Lima, Peru, where he collected water and sewer system information on site in Lima. He used existing AutoCad files as digital basemap and commenced "heads up" digitizing of systems and linked CAD files to database and generated hydraulic model input for both sewer and water systems. Mr. Stangel used ArcInfo- and ArcView-based GIS to create demand values for the water model. These demands were then scaled by a field verified multiplier for the

sewer model. Hydraulic modeling was used as a design tool to indicate and then verify where improvements or replacements in the system where to be made.

Mr. Stangel served as project manager for the development of a collection system model for the City of Idaho Falls. The project included constructing the model from the City's GIS data as well as collecting flow data from locations within the system to perform both dry and wet weather calibration. The final phase of the project includes performing existing and future deficiency analysis and subsequent identification of improvements. Training of City staff on the use of the InfoSWMM model is also included in the project.

Mr. Stangel managed a project for the Sammamish Plateau Water and Sewer District to develop a unidirectional flushing (UDF) program for its water system. The District has historically performed traditional flushing of hydrants, however in 2008, in conjunction with additional hydraulic model refinements, MSA was contracted to develop a system-wide plan for UDF. The UDF plan provides a systematic approach for maintenance crews to open and close valves and hydrants in the system to achieve adequate velocities during the flushing process. This plan ultimately provides more than 500 individual flushing sequences in a map book format for use in the field.

Mr. Stangel was the task lead for the system analysis and hydraulic model update. As part of the project the City's ESRI Geodatabase water layers were modified to ensure topological connectivity and attribute completeness, prior to use in generating a new GIS based hydraulic model. The model was calibrated using field data and evaluated under existing and future conditions peak demand and fire flow conditions. New groundwater supply available from a joint Rockwood PUD groundwater project was also incorporated into the analysis. Growth areas to the south of the City were evaluated in terms of supply, transmission and storage requirements. Ultimately procedures to maintain the model and GIS synchronization were implemented.

Key Project Experience

- Hydraulic Model Analysis and Training, PUD No. 1, Asotin County, Washington
- Water Master Plan Analysis and Hydraulic Model Training, City of The Dalles, Oregon
- Water Master Plan Updates, Golden State Water Company Regions 2 & 3, California
- Comprehensive Water System Study, Mountain Home Air Force Base, Idaho
- Geodatabase Construction and Hydraulic Model Development, Snohomish County Public Utility District, Washington
- Updated Water System Hydraulic Model, City of Everett, Washington
- Collection System Model Development and Capital Improvement Plan Development, City of Twin Falls, Idaho
- Water and Wastewater Master Plan, City of Redmond, Oregon
- Hydraulic Model, City of Spokane, Washington
- Water System Master Plan Update ('05-'06), City of Meridian, Idaho
- Water Comprehensive Plan and Ongoing Modeling Support, Sammamish Plateau Water and Sewer District, Washington
- Water System Master Plan Update ('01-'02), City of Meridian, Idaho
- Water Comprehensive Plan, City of Mercer Island, Washington
- Water System Master Plan Update, City of Fairview, Oregon
- Water System Master Plan Update, City of Dallas, Oregon
- Water System Master Plan Update, City of Tualatin, Oregon
- Water System Master Plan, City of Waco, Texas
- Cougar Mountain East Village Water Facilities, TALUS Development Co., Issaquah, Washington
- Hydraulic Analysis, City of Ontario, Oregon
- Hydraulic Computer Model for the Sanitary and Combined Sewer System, City of Everett, Washington
- Salquist Pump Station and Wheeler Reservoir Chlorine Residual Booster Station, City of Gresham, Oregon
- Water Infrastructure Improvement Project, Commonwealth of Puerto Rico
- Water Distribution System Conversion and Modeling Project, City of Phoenix, Arizona
- Water and Wastewater System Design Project, City of Lima, Peru
- 2002 General Sewer Plan Update, City of Mercer Island, Washington
- Fiber Optic Cable Siting Project, City of Penang, Malaysia
- Extended Period Water Quality Analysis, Southern California Water Company, California
- Beef Bend/Elsner/Scholls-Sherwood Roadway Improvement Project (BBESS), Oregon Department of Transportation
- Conversion Project, Asheville Buncombe Water Authority, North Carolina
- Sewer Collection System Model Calibration, City of Bend, Oregon
- Water System Redundancy and Storage Evaluation, City of Meridian, Idaho
- Low Water Pressure Mitigation, City of Lacey, Washington
- Water Modeling Services, City of Mercer, Washington
- Water Planning and Modeling, City of Winter Park, Florida
- Hydraulic Analysis, City of Winter Park, Florida
- Water System Master Plan, City of Gresham, Oregon

William S. Evonuk, P.E., Civil Engineer, Associate

Key Credentials

Education
BS in Civil Engineering, Portland State University

Registration
Civil Engineer, State of Oregon

Professional Activities
American Society of Civil Engineers
American Water Works Association

9 Years of Experience

Career Summary

Mr. Evonuk is an MSA associate engineer with experience in water supply system development, city engineering, roadway design and construction, sanitary sewer engineering, stormwater engineering and construction management for public agencies.

Experience Overview

Key Expertise: Water Transmission & Distribution System Piping Design, Dams, Hydraulic Structures Design, PCC & AC Roadway Reconstruction, Culvert/Fish Passage Design, Vacuum Sewers, Control Valve & Metering Systems, City Engineering, Construction Management, Cost Estimating

Mr. Evonuk managed MSA's final design work for the City of Portland Water Bureau Bull Run Dam No. 2 Stilling Basin/Walker Creek Culvert Fish Passge Improvements project. This project involved predesign studies to replace an existing stilling basin weir in the Bull Run River and final designs for the replacement of an existing culvert with a fish-friendly arch-culvert. The project was complicated by the presence of Portland's three large diameter water supply conduits routed through the stilling basin and over the Walker Creek Culvert.

Mr. Evonuk recently served as design engineer and is currently the project manager during construction of a complete vacuum sewer system for the Miles Crossing Sanitary Sewer District. The project consists of 37,000 feet of vacuum sewer mains, a 2,000 foot direction drill under Youngs Bay, a 200 horse power vacuum/pump station, a biofilter to treat air extracted from the vacuum lines, and a calcium nitrate chemical feed system for hydrogen sulfide control. This project requires a substantial level of coordination with the Oregon Department of Environmental Quality (DEQ) and the US Army Corps of Engineers, public involvement and communication with district customers.

Mr. Evonuk is currently serving as MSA's project manager during construction for the Stoney Mountain Off-Line Storage Facility and Water Treatment Plant Project for the City of Sheridan, Oregon. This project includes the construction of an earthfill dam with a storage capacity of 60 million gallons. In addition, the project includes the following: installation of 1,600 feet of 16-inch diameter raw water transmission piping, 500,000 cubic yards of earthwork, soil/cement amendment, roadway construction and the stabilization of an existing landslide. This project included conducting groundwater investigations and the completion of two horizontal test wells. The project will enhance the City's current Coast Range water supply system and will accommodate City water demands for an estimated 25 years of projected growth.

Mr. Evonuk currently serves as MSA's project manager during construction for the Downtown Utility Undergrounding and Streetscaping project for the City of Sandy, Oregon. This project includes approximately 14,000 feet of trenched conduit runs, 10,000 feet of horizontal directional drilled conduit, 240 vaults and handholes, and service conversion work for 80 private properties. The project also includes installation of an underground fiber communication system, including blown fiber, installation of conduit, vaults and traffic signal poles for a traffic signal interconnect system. Streetscaping improvement work includes construction of new curb extensions, new sidewalks with decorative paver strips and decorative concrete scoring, decorative streetlights, street trees with underground tree lighting system and storm sewer modifications. This project requires

sequencing of project work and coordination with the City, Oregon Department of Transportation (ODOT), DEQ, utility agencies, private property and business owners, and other contractors.

Mr. Evonuk is currently serving as MSA's project manager for the Bear Creek Dam Waterline Replacement Project for the City of Astoria, Oregon. This project includes preliminary engineering and design for replacing approximately 1,500 feet of existing steel and PVC finished water transmission piping with 24-inch diameter HDPE transmission piping. Related work includes design of new metering and electrically controlled valving facilities, relocating chemical injection facilities, siting and sizing analysis of a future clear well, project cost estimating and hydroelectric feasibility analysis.

Mr. Evonuk recently completed the design and served as project manager during construction for the Exploratory Well Project for the City of Dundee, Oregon. This project consisted of design and construction of an 800-foot deep exploratory well, well installation, well development, and aquifer testing to determine the adequacy of the City's existing aquifer for additional wells.

Mr. Evonuk currently serves as MSA's primary contact for City Engineering services for the City of King City, and as assistant City Engineer for the City of Sheridan, Oregon. Under these assignments, Mr. Evonuk has served as project manager for design and has managed the construction contract administration for the following projects: 116th Avenue Roadway Reconstruction project, Royalty Parkway Street and Storm Drainage Improvements project, King City Cul-de-sac Resurfacing project (2007), King City Cul-de-sac Resurfacing project (2008) and the King City Street and Curb Marking project (2007).

Mr. Evonuk recently served as an engineering field representative for construction observation and administration of the McGuire Reservoir Expansion project for McMinnville Water and Light (MW&L). This project included raising an earthfill dam 30 feet, thereby increasing storage capacity from 3,760 acre feet to 9,800 acre feet. In addition, the project included installation of 1,200 feet of 24-inch, 30-inch and 48-inch diameter welded steel piping, 750,000 cubic yards of earthwork, 7,500 cubic yards of reinforced concrete, and 25 acres of constructed wetlands. Also included were 2.5 miles of roadway relocations including Nestucca River Highway, Old Bald Mountain Road, and High Heaven Road relocations. The project also included an instrumentation and control building, housing an automated hydraulic valve operation system and a supervisory control and data acquisition (SCADA) system, as well as triple redundancy power supply backup including solar power generation. Mr. Evonuk also served as staff engineer during design of this project and assisted with design, specifications and project cost estimating.

Mr. Evonuk served as the on-site representative during construction for the Scouter's Mountain Sanitary Sewer Improvements project for the Cascade Pacific Council, Boy Scouts of America. This project included installation of approximately 2,000 feet of 8-inch diameter and 650 feet of 4-inch PVC sanitary sewer mains, approximately 45 feet of 2-inch sanitary sewer forcemain, connections to an existing sanitary sewer system, and related piping, pavement removal and replacement, manholes and appurtenances.

Mr. Evonuk recently served as project engineer on the design of several Oregon Department of Transporation (ODOT) highway projects. Recent or current projects include US 20/OR 34 in Philomath, Oregon, US 101 in Waldport, Oregon and OR 140 in Klamath County, Oregon.

Mr. Evonuk assisted with design and construction management of Sunrise Water Authority's 4.0 million gallon (mg) prestressed concrete reservoir located on Scouter's Mountain in Clackamas County. MSA provided final design, project cost estimating, land use permitting, bidding and construction management services for the selected alternative, a fully buried 4.0-mg reservoir. In addition to the cast-in-place reservoir structure, the project included on-site inlet and outlet piping and control vaults, overflow and drain piping, stormwater detention facilities, telemetry system improvements, a paved parking lot and site landscaping. A fast-track hybrid design-build engineering work program for the reservoir structure was utilized to meet the project's aggressive schedule which was necessary to serve the Authority's fast-growing service area.

William S. Evonuk, P.E., Civil Engineer, Associate

Mr. Evonuk assisted with a project that evaluated the concept of developing a supplemental groundwater supply in the vicinity of Portland's Bull Run system headworks below Bull Run Dam No. 2. The project evaluated the water quality, engineering, cost estimating, regulatory and other aspects of developing such a supply system and included desk-top blending studies, groundwater source development and connection evaluations.

Mr. Evonuk also recently served as project engineer on the City of Forest Grove's Martin Road Waterline Replacement project. This project included tight corridor pipeline routing and a complex creek crossing.

Mr. Evonuk recently completed the design and served as the on-site representative during construction for the Royalty Parkway Street and Storm Drainage Improvements for the City of King City, Oregon. This project included the replacement of approximately 1,550 feet of severely deteriorated pavement and base rock with an improved roadway cross-section designed to accommodate existing vehicle and Tri-Met bus loadings. In addition, the project included the replacement of catch basins, storm drainage piping, driveway aprons, ADA ramps and speed bumps.

Mr. Evonuk served as a field representative for construction observation for the ODOT on the Haynes Inlet Bridge Project in North Bend, Oregon. This project included the construction of a four lane, seven span concrete bridge on Highway 101, crossing an environmentally sensitive estuary. In addition, this project included the following: approximately 2,000 feet of roadway improvements to Highway 101, 1,500 feet of storm drainage piping, the construction of approximately 1,000 feet of retaining walls and utility relocations.

Mr. Evonuk has also served as a field representative for ODOT on approximately five miles of 4-lane asphalt grinding and resurfacing on Highway 30 at St. Johns Bridge, six miles of 6-lane asphalt overlay on Interstate-5 from the Willamette River to the Tualatin River, and the resurfacing of the Boone Bridge deck with micro-silica concrete.

Key Project Experience

- Bull Run Dam No. 2 Stilling Basin Rehabilitation/Walker Creek Culvert Replacement, City of Portland Water Bureau, Oregon
- City Engineer, City of King City, Oregon
- Miles Crossing Vacuum Sewer System Project, Miles Crossing Sanitary Sewer District, Clatsop County, Oregon
- Downtown Utility Undergrounding and Streetscaping Project, City of Sandy, Oregon
- Bear Creek Dam Waterline Replacement Project, City of Astoria, Oregon
- Stoney Mountain Off-line Storage, City of Sheridan, Oregon
- McGuire Reservoir Expansion, McMinnville Water and Light, McMinnville, Oregon
- Bull Run Groundwater Supply, Bureau of Water Works, City of Portland, Oregon
- 4.0 MG Reservoir No. 8A, Sunrise Water Authority, Clackamas County, Oregon
- Martin Road Waterline Replacement Project, City of Forest Grove, Oregon
- Boy Scouts of America Sanitary Sewer Improvements, Sunrise Water Authority, Clackamas County, Oregon
- Headstart Off-site Storm Drainage Facility, City of Sheridan, Oregon
- Gales Creek Supply Line Relocation, City of Forest Grove, Oregon
- Royalty Parkway Street and Storm Drainage Improvements, City of King City, Oregon
- Haynes Inlet Bridge, Oregon Department of Transportation, North Bend, Oregon
- Highway 101 Roadway Improvements, Oregon Department of Transportation, North Bend, Oregon
- Highway 30 Roadway Improvements, Oregon Department of Transportation, Oregon
- Interstate 5 Resurfacing from Willamette River to Tualatin River, Oregon Department of Transportation, Oregon
- Boone Bridge Micro-silica Overlay, Oregon Department of Transportation, Oregon
- Exploratory Well, City of Dundee, Oregon

Garry M. Truyens, Staff Engineer

Key Credentials

Education
Baccalaureus Technologiae Civil Engineering, Cape Technikon, Cape Town, South Africa

6 Years of Experience

Career Summary

Mr. Truyens joined Murray, Smith, & Associates, Inc (MSA) in 2008 after serving as a staff engineer for the design of commercial and residential land development projects in Maryland, Pennsylvania and Oregon. Mr. Truyens has several years of experience working with the public and private sector to plan, design and implement property improvements, including stormwater management, roadway and utility infrastructure.

Experience Overview

Key Expertise: Wastewater Pump Stations & Lift Stations, Gravity Sewers & Force Mains, Sewer Rehabilitation, Combined Sewer Overflow (CSO) Control, Stormwater Basin Analysis & Master Planning, Hydrologic & Hydraulic Modeling, On-site Detention, Retention & Water Quality Analysis & Design, Drainage Piping & Culvert Design, Street & Road Planning & Design, Subsurface Utility Engineering (SUE), Trenchless Technologies & Railroad Crossings

Mr. Truyens was a staff engineer on a major sewer rehabilitation project for the City of Springfield, Oregon. He assisted with the preparation of a predesign report for the rehabilitation of approximately 35,000 feet of aging sanitary sewer pipe in the City. Mr. Truyens conducted predesign field investigations documenting existing sewer and site features within the project boundaries. He then assisted in the preparation of final plans and specifications for six separate sewer rehabilitation construction contracts. Mr. Truyens also assisted with the final design and preparation of final plans and specifications for the rehabilitation of 3,000 feet of 42-inch diameter sanitary sewer pipe by means of the cured-in-place pipe method. Mr. Truyens is currently assisting with the support of the firm's construction management for the seven construction contracts.

Mr. Truyens is currently a staff engineer for the Wastewater Treatment Facility Influent Pump Station and Force Main Upgrades project for the City of Sheridan. The project includes assisting in existing flow analysis and a pump station capacity study to accompany a predesign technical memorandum outlining the required improvements to the existing pump station and accompanying force main to accommodate future flow increases.

Mr. Truyens recently performed design work on the stormwater detention element for the I-5: Tualatin River – Willamette River Bridge preservation project for the Oregon Department of Transportation (ODOT). The project will include repairing and resurfacing approximately six miles of freeway between Tualatin and Wilsonville as well as safety improvements to bring existing features to current standards. Along with resurfacing and improving the existing section of roadway, ODOT has also decided to widen a portion of the roadway allowing for a dedicated acceleration lane.

As a staff engineer, Mr. Truyens assisted in the preparation of a technical memorandum outlining the alternative routes examined for a new sanitary sewer force main linking a new sanitary sewer pump station to be built in the City of North Plains with the Bendemeer trunk main in the City of Hillsboro. Mr. Truyens generated existing utility mapping of the surrounding areas by coordination with all service providers in the area. Additionally, he field-verified all proposed route alternatives to ensure feasibility and looked for potential conflicts not shown in as-built drawings. In conjunction with the new force main routing study, the existing North Plains sanitary sewer force main and appurtenances were inspected to ensure that they could safely remain in service until the completion of the proposed pump station and force main. The technical memorandum that Mr. Truyens prepared recommended the required maintenance and improvements to extend the safe operation life of the existing North Plains force main a further three to five years.

Garry M. Truyens, Staff Engineer

Mr. Truyens served as staff engineer for the City of Bandon's Colony Condominium Development project, aiding with site grading to ensure all condominiums had ocean views and helping the architect with street layouts to ensure fire truck access to all units. Mr. Truyens also designed underground site utilities, including aiding in the design of the privately owned sewer pump station, and coordinated with the City of Bandon and the Oregon Department of Environmental Quality (DEQ) to ensure all pump station design requirements were met.

For the Orchard Heights Assisted Living Facility in the City of Salem, Oregon, Mr. Truyens assisted in site layout, ensuring the most efficient use of space while meeting all open space and setback requirements. Challenges involved in the site layout included locating the 200,000-square foot assisted living facility on the existing twelve percent hillside while maintaining ADA access to all portions of the facility. Stormwater management facilities were required to mediate the increased runoff produced by the new construction. Due to the existing steep slopes, two terraced ponds were required to meet the City of Salem's stringent detention requirements. High groundwater in the project area also required a rough grading, dewatering and temporary erosion control plan to allow for the construction of the first floor of the facility. Once the foundation drains, additional dewatering measures and the first floor stem walls were completed, the final grading plan followed to secure fire and emergency access to all portions of the building. Additionally, Mr. Truyens designed all underground utilities and aided in the design of a 24-inch diameter line stop required for the relocation of an existing water main.

Key Project Experience

- Sanitary Sewer Rehabilitation, City of Springfield, Oregon
- Wastewater Treatment Facility Influent Pump Station and Force Main Upgrades, City of Sheridan, Oregon
- I-5 Capital Hwy – Tualatin River and I-5 Wilsonville Road – Willamette River Bridge, Oregon Department of Transportation
- North Plains Force Main Relocation, Clean Water Services, Oregon
- Colony Condominium Development, City of Bandon, Oregon
- Orchard Heights Assisted Living Facility, City of Salem, Oregon

William H. Hollings, III, P.E., Principal Engineer

Key Credentials

Education
MS in Civil Engineering, Oregon State University
BS in Civil Engineering, Bucknell University

Registration
Civil Engineer, State of Oregon
Certified NAUI SCUBA Diver

Professional Activities
American Society of Civil Engineers
American Water Works Association

33 Years of Experience

Career Summary

Mr. Hollings is a principal engineer with Murray, Smith & Associates, Inc. (MSA) and has extensive experience in the civil and construction engineering fields. Mr. Hollings has successfully completed a variety of engineering and construction projects for government agencies and private industries.

Experience Overview

Key Expertise (Stormwater, Streets & Roads): Highway Design, Bridge Design, Construction Management, Construction Feasibility Analyses, Fish Passage Designs, Wetland Reconstruction, Storm Drainage Detention & Treatment, Off-Shore Embankment Construction Inspection, Hydraulic Engineering Studies & Structure Designs, Railroad System Construction & Maintenance

Stormwater, Streets & Roads Experience

Mr. Hollings is a highly practical, no-nonsense engineer with proven field experience in challenging construction conditions. Mr. Hollings has served in key project, design and construction management roles for a large variety of public works transportation projects for the Oregon Department of Transportation (ODOT) and municipalities. He is presently managing construction at the City of Springfield's major sewer rehabilitation project.

In addition to directing general storm drainage designs associated with the roadwork projects described below, Mr. Hollings has managed the design of a variety of fish passage enhancement projects, including naturalized river improvements, precast concrete bridges and large-diameter corrugated metal arch pipes. Mr. Hollings recently managed the design of a precast concrete bridge to provide fish passage capability in conjunction with a large water quality swale designed to treat runoff associated with the I-5 at Beltline Interchange Project in Springfield/Eugene. He directed the design and construction of environmental mitigation elements constructed with the McGuire Reservoir Expansion Project, including natural fish passage improvements for "the Chute" area of the Nestucca River. For the US20: Philomath Couplet Project (ODOT) Mr. Hollings directed the design of a fish-friendly, large-diameter corrugated metal arch pipe to provide fish access to upstream habitat. Mr. Hollings is well experienced in working with permitting agencies such as the US Army Corps of Engineers and the Oregon Department of State Lands, as well as other stakeholders including Oregon Department of Fish and Game and the National Marine Fisheries Service. For these organizations, MSA provides functional, cost-effective designs that enhance habitat while serving as integral components of the transportation system.

Mr. Hollings served as the project manager for the US 101: Alsea Bay Bridge – William Keady Wayside project, City of Waldport and ODOT, Waldport, Oregon. MSA completed preliminary and final designs for downtown enhancements, traffic signal improvements and pavement preservation along US 101 in the City of Waldport. The project included right-of-way acquisition, streetscaping and roadway design, utility undergrounding, public involvement, construction staging, and mobility considerations. The project is currently nearing completion.

Mr. Hollings is currently serving as the project manager for the OR 140: North Fork Little Butte Creek – Green Springs Highway, ODOT Regions 3/4 project. The project involves pavement preservation and safety improvements, including the addition of left turn lanes on 30 miles of OR 140 – Lake of the Woods Highway.

Project elements include stormwater management with increased areas of impervious surface and potential wetlands impacts, roadway widening, drainage upgrades, landslide mitigation elements and culvert repairs, utility coordination, and evaluations and improvements to rights-of-way, left turn lanes, shoulder widths, guardrails, bridge rail/guardrail transitions, signage, striping and existing slow-moving vehicle turnouts in conjunction with current ODOT guidelines. Phase 2 of the project is currently under construction.

Mr. Hollings is serving as the project manager for the US 97 at Iris Lane, ODOT Region 4 project. MSA is currently completing designs for safety improvements to The Dalles/Cal. Highway near Culver, Oregon. Project elements include roadway widening, right-of-way, left turn lane, stormwater management with increased areas of impervious surface and potential wetlands impacts, and utility coordination.

As an extension of subsurface engineering work associated with ODOT's Beltline Interchange Reconfiguration project, MSA provided storm drainage basin analysis and system improvement designs. Currently serving as assistant project manager, Mr. Hollings has aided in coordinating this work with the overall interchange improvement designs. After various scenarios for stormwater detention and conveyance were analyzed, improvements implemented and currently under construction include a 3,050-cubic meter stormwater detention facility, a 1,620-meter long multi-celled, linear, grassy swale-style surface water quality feature and flood channel, and a maintenance access road with a precast concrete box culvert.

Mr. Hollings is currently serving as the project manager for the North Leadbetter Extension Overcrossing project utility coordination, design and relocation for the Portland Department of Transportation and the ODOT. Project work includes the design of approximately 1,000 feet of 48-inch storm sewer piping, 16-inch sanitary sewer piping, 16-inch ductile iron potable water piping and over 600 feet of PVC piping for non-potable irrigation water. Project work also includes extensive coordination with the Port of Portland, City of Portland Water Bureau and the City of Portland, Bureau of Environmental Services.

Mr. Hollings served as the project engineer (project manager for construction engineering [CE] phase) for the US 20: Philomath Couplet project, ODOT, Philomath, Oregon. The project included extensive sidewalk relocation and replacement, infill of "missing" sidewalk segments on the east and west ends of the project, careful design of sidewalk to existing driveway connections, ADA ramps, and the addition of bike lanes throughout the project corridor. Curbside parking was removed from the south side of the new eastbound couplet leg to provide adequate space for two-lane traffic, a bike lane and curbside parking on the north side. A push button-activated flashing beacon for a pedestrian crossing with a median refuge to allow safe crossing of Main Street was included. Additional efforts included surveying, right-of-way acquisition planning, access management planning, Threatened and Endangered (T&E) species evaluation, wetlands delineations, archaeological and historic baseline reports, phases 1 and 2 environmental site assessments, and noise studies. Work also included the design for a five-lane replacement bridge over Newton Creek. The project involved complex coordination between ODOT and the City, in addition to intensive public involvement. The project was recently completed.

Mr. Hollings served as the project manager and QCCS for the CE phase for the Highway 47, Azalea Street - 2nd Street project, ODOT, Yamhill, Oregon. This project addressed localized drainage/flooding problems; corrected very skewed highway cross-section geometry; replaced existing, inadequate storm facilities, curbs, and gutters; and included streetscape improvements such as sidewalk replacements, decorative street lighting and other public amenities. MSA developed an intergovernmental agreement between ODOT and the City of Yamhill to formalize maintenance and operations responsibilities. Mr. Hollings not only oversaw and documented all required field testing and placement of construction materials on this project, but also responded to contractor requests for information, supervised MSA's field inspector, and was the primary liaison between ODOT, the City of Yamhill, the contractor, Yamhill County and the general public. He led and documented weekly construction meetings with the contractor, the City and other interested parties. Mr. Hollings is intimately familiar with ODOT's construction engineering systems and requirements, including all final documentation requirements for auditable contract administration payment documentation systems and construction quality assurance plans.

William H. Hollings, III, P.E., Principal Engineer

Mr. Hollings served as a key design lead and construction manager of a major multi-discipline work program for McMinnville Water and Light (MW&L) that involved a wide range of complex technical, legal, regulatory and permitting challenges. This $20 million program included expansion of MW&L's McGuire Reservoir, water treatment plant improvements at MW&L's Haskins Creek facility, several miles of Nestucca River Highway relocation, reconstruction of 1,500 feet of a natural drainage swale, extensive wetlands mitigation improvements for fish passage enhancement, rehabilitation of two major stream diversions, and other major outlet facility improvements associated with the Walter Link Dam and Haskins Reservoir. The McGuire Reservoir Expansion project included raising an earthfill dam 30 feet to increase storage capacity from 3,760 acre feet to 9,800 acre feet. In addition, the project included installation of 1,200 feet of large diameter steel piping, 750,000 cubic yards of earthwork, 7,500 cubic yards of reinforced concrete, 2.5 miles of roadway relocations and 25 acres of constructed wetlands. The project also included an instrumentation and control building housing an automated hydraulic valve operation system and a supervisory control and data acquisition (SCADA) system, as well as triple redundancy power supply backup with solar power generation.

Mr. Hollings served as the project engineer (assistant project manager for CE Phase) for the Nestucca River Highway and High Heaven Road Realignment project for MW&L. The project involved planning, permitting, design and construction of approximately three miles of Bureau of Land Management highway relocation associated with a major MW&L water supply system improvements program in the Oregon Coast Range. Work included aerial survey topographic mapping, development of realignment alternatives, interagency coordination, landslide mitigation, right-of-way acquisitions, environmental permitting, plans, specifications and estimate (PS&E) development, and construction administration.

Mr. Hollings served as the project engineer for the S-10 (Bull Run watershed access road) Road Improvements for the Portland Water Bureau. The project involved safety and roadway stability improvements.

Key Project Experience – Stormwater, Streets & Roads

- Sanitary Sewer Rehabilitation, City of Springfield, Oregon
- McGuire Reservoir Expansion including Nestucca River Highway 8 Road Realignment, Haskins Creek and Reservoir Facility Improvements, and Walter Link Dam Facility Improvements, McMinnville Water and Light, McMinnville, Oregon
- US 20: Philomath Couplet (ODOT/OTIA), Oregon Department of Transportation, Philomath, Oregon
- Highway 47, Azalea Street, (ODOT/OTIA) 2nd Street, Oregon Department of Transportation, Yamhill, Oregon
- O.H. Hinsdale Wave Research Laboratory Expansion, Oregon State University, Corvallis, Oregon
- Fish Passage Improvements, Hydraulic Model Study, PGE Willamette Falls Hydroelectric Power Plant, Oregon
- US 101: Alsea Bay Bridge - William Keady Wayside, Oregon Department of Transportation, Waldport, Oregon
- Highway 140, Lake of the Woods Highway, Oregon Department of Transportation
- I-5: Beltline Interchange, Oregon Department of Transportation
- I-5: Capitol Highway - Willamette River Bridge Preservation Project, Oregon Department of Transportation
- Ocean Outfall Rock Armor Stability, Hydraulic Model Studies, Cities of Goleta, San Diego, and Los Angeles County, California
- Railroad Grade Crossing Reconstruction, Consolidated Rail Corp for New Jersey DOT, North Jersey Coast Line, Hoboken, New Jersey
- Offshore Remote Environmental Sensing, U.S. Army Corps of Engineers, Oregon, Washington
- Field Wave Gaging Program, Waterways Experiment Station, U.S. Army Corps of Engineers, Vicksburg, Mississippi
- OR 140: N. Fork Little Butte Creek - Green Springs Highway, Oregon Department of Transportation
- North Leadbetter Extension Overcrossing, Portland Department of Transportation/Oregon Department of Transportation
- US 97 at Iris lane, Oregon Department of Transportation
- S-10 Road Improvements, City of Portland Water Bureau, Oregon
- Endicott Island Offshore Oil Production Facility, Slope Protection Construction Inspection, Sohio, Prudhoe Bay, Alaska

Mark D Smith, Staff Engineer

Key Credentials

Education
BS in Civil Engineering, Oregon State University

Registration
Engineer-in-Training, State of Oregon

Career Summary

Mr. Smith joined Murray, Smith & Associates, Inc. (MSA) in 2005 and has since been involved in a variety of planning, design and construction administration projects.

Experience Overview

Key Expertise: Field Engineering, Construction Management, Water & Wastewater Facilities Design

Mr. Smith is currently assigned as MSA's construction field engineer for the City of Springfield Sanitary Sewer Rehabilitation Project. This is a multi-phased project scheduled for construction by the end of 2009. This project involves the rehabilitation of seven sanitary basins throughout the City, including the Marcola Interceptor, a 42-inch sewer main.

Mr. Smith served as MSA's construction field engineer for the final phase of MSA's multi-year Stoney Mountain Reservoir project for the City of Sheridan. The Stoney Mountain Reservoir is a 60-million gallon earth/rock impoundment off-line storage.

Mr. Smith assisted with MSA designs for the Oregon Park and Recreation Department's Cape Lookout State Park on-site wastewater drainfield relocation project. This project includes the replacement of drainfields that were damaged during a winter storm in 2007 and requires forcemain alignment, pump station improvements and drainfield relocation. Work included an evaluation of various treatment and land application alternatives.

Mr. Smith recently served as MSA's staff engineer/construction inspector for the City of Forest Grove's ongoing private development in the City. Mr. Smith was also the City's authorized erosion control inspector of large development and single-family construction projects. The inspection work included plan review, construction observation reporting, daily site visits, documentation of erosion control discrepancies and coordinating with contractors to ensure erosion control program compliance. Mr. Smith's work included the inspection of 12 subdivisions.

Mr. Smith recently served as staff engineer for the Water Pump Stations Modifications and Improvements project for the City of Lake Oswego. This work included modifications and improvements to three pump stations for the City, water flow analysis for pump sizing, cost estimation of the complete pump station, analysis of air reducing intake and out-take air dampeners, and design of suction and discharge piping.

Mr. Smith assisted with construction administration services for the 2005 West Main Street (OR 18B) Sidewalk Improvements – Bridge to Olive Street for the City of Sheridan. This work included daily site visits, construction observation reporting, on-site plan review and plan modifications.

Similarly, Mr. Smith assisted in construction administration services for the 2005 Phases 5 & 6 Watermain and Fire Hydrant Improvements project for the Powell Valley Water District. This work included daily site visits, construction observation reporting, on-site plan review and plan modifications.

Mark D Smith, Staff Engineer

Key Project Experience

- Sanitary Sewer Rehabilitation, City of Springfield, Oregon
- Stoney Mountain Off-line Storage Facility, City of Sheridan, Oregon
- Cape Lookout State Park Sanitary Sewer System Improvements, State of Oregon Parks and Recreation Department
- Water Pump Stations Modifications and Improvements, City of Lake Oswego, Oregon
- Phase 5 and 6 Watermain and Fire Hydrant Improvements, Powell Valley Road Water District, Portland, Oregon
- Construction and Erosion Control Inspector (Trunk Sewers and Private Development), City of Forest Grove, Oregon
- SE McLoughlin Blvd Tonkin Kia Waterline Crossing, City of Gladstone, Oregon
- West Main Street (OR 18B) Sidewalk Improvements, City of Sheridan, Oregon
- View Acres Pump Station Upgrades and Water Distribution System Improvements, Oak Lodge Water District, Oregon

Jerry Lane, PE — OBEC – Eugene

Principal Engineer – Roadway

Jerry Lane, PE, is Principal Engineer for the Roadway/Civil Engineering Group at OBEC. He is responsible for coordinating roadway design, hydraulic analysis and design, and the preparation of construction plans. Jerry has extensive experience with InRoads and MicroStation as well as other computer software, and his project development experience ranges from preliminary design to plan preparation on more than 100 highway and bridge projects.

Relevant Project Experience

Hazel St.: 9th to East of 10th, Central Point, Oregon
Principal Engineer for this improvement of a one-block section of Hazel Street. Improvements include reconstructing the existing gravel street with new curb, gutters, sidewalk, asphalt pavement, and new storm drainage facilities. Work includes overall project management; topographic surveying; roadway, storm sewer, signing, and striping design; environmental documentation; hazardous materials Level 1 investigation; specifications; and cost estimates. Ongoing

Middle Fork Willamette River Loop Path, Springfield, Oregon
Senior QA/QC for the design of four miles of multi-use path for Willamalane Park & Recreation District in Springfield. OBEC conducted a feasibility/alignment study and is providing final design for the path along the Middle Fork of the Willamette River, connecting Doris Living History Ranch with Clearwater Park. Work includes all permitting, structure design for two creek crossings, and trailhead design with restrooms. Ongoing

Aurora-Salem Paving & Safety Improvements, ODOT
Principal-in-Charge responsible for contract management and senior QC review for this combination 4R/3R project on Highway 99. Ongoing

US 26: SE 51st Avenue to I-205 (Powell Blvd.), Portland, Oregon
Project Manager for roadway design of a 3R pavement preservation project on US 26 (Powell Blvd.) from SE 51st Avenue to I-205. Project includes pavement inlay, hazardous materials assessments, signing, striping, signal modifications, and noise analysis to support a nighttime construction variance. Ongoing

Courthouse District Transportation Improvements, Eugene, Oregon
Senior QA/QC for a project providing transportation improvements surrounding the new Federal Courthouse in the City of Eugene. Work involved both vehicular and pedestrian access improvements and included new paving and pavement preservation. New roadway sections, traffic signals, illumination, underground utilities, and storm drainage improvements were included. 2008

9th: N. Hazel Street – N. Tenth Street, Central Point, Oregon
Principal Engineer for this award-winning project to make full street and water system improvements to five city blocks of existing residential gravel streets. Project included installation of more than 1,800 feet of new 8-inch ductile iron water main and more than 20 water service connections. This project also included providing a new storm drainage system, retaining walls, curbs, sidewalks, pavement sections, signing, and striping. 2007

Years of Experience: 29

Education
- BS, Civil Engineering, University of California, Davis, 1979

Registration
- Civil Engineering, Oregon PE No. 12295 (1983)
- Civil Engineering, California PE No. 34955 (1982)

Certifications
- CS³ Certification, 2006
- ODOT Traffic Control Plans Design, 2006

Professional Affiliations
- American Public Works Association
- American Council of Engineering Companies of Oregon (ACEC Oregon)

Heceta Head State Park Access Improvements, ODOT
Project Manager for project consisting of construction of a 1,225-foot paved access road. The project provided safe traffic access to Heceta Head lighthouse off Highway 101 and an ADA-accessible pedestrian crossing connecting to State Park properties on both sides of the highway. 2007

21st Street: "J" Street to "D" Street, Springfield, Oregon
Project Manager for reconstruction and widening of 2,200 feet (approximately six blocks with six intersecting streets) of 21st Street and construction of new storm sewer. The two-lane roadway varies in width from 38 feet to 46 feet curb-to-curb with asphalt surfacing, curbside sidewalks, and on-street parking. Illumination and permanent striping and signing were also included. 2006

Wagner and Colver Street Improvements, Talent, Oregon
Project Manager for this roadway reconstruction project. OBEC provided overall project management, surveying, and road improvements to increase mobility for bicyclists and pedestrians. Key elements of the project included widening the existing street to accommodate bike lanes, adding sidewalks, installing storm drainage facilities to meet current standards, and replacing 2,000 feet of existing water line. The project also involved close coordination with impacted utilities and with the ODOT Rail Section to ensure minimal impact to the railroad during roadway and waterline construction. 2006

Hwy. 213/South Beavercreek Road, Oregon City, Oregon
Project Manager/Roadway Design Team leader for the reconstruction of a major urban intersection. This Federal-aid project consisted of widening and upgrading 3,250 feet of Hwy. 213 and 2,625 feet of Beavercreek Road. Project elements included roadway and structure design; sidewalk improvements; stormwater drainage; landscape and irrigation; MSE walls; off-site mitigation for a 15-foot-diameter culvert and associated roadwork; two new traffic signals; temporary traffic control and staging plans; illumination; right-of-way mapping, descriptions, and acquisition; and contract administration and inspection. 2005

Vine Street – Maple Street, Lebanon, Oregon
Project Manager for street improvements to four city blocks of Main Street (Santiam Highway) in Lebanon, including new intersection bulb-outs with sidewalks, curb and gutter, tree grates, new catch basins, and a bike shelter. 2005

Grandview Avenue Road Improvements, Grants Pass, Oregon
Project Manager/Roadway Design Team leader for the reconstruction and widening of approximately 1.2 miles of Grandview Avenue from a rural road to urban collector standards incorporating bike lanes, curb and gutter, storm drain system, and a setback sidewalk with planter strip. Work included site survey, traffic calming features, relocating and reconstructing a decades-old roadside irrigation canal, minimizing impacts to adjacent properties and right-of-way mapping and descriptions. 2005

Pine St. – Hwy. 99 Improvement Project, Central Point, Oregon
Project Manager/Roadway Design Team leader for widening and reconstruction of a major signalized intersection. Work included widening and reconstructing an at-grade railroad intersection and obtaining a Railroad Crossing Order, the addition of turn lanes at the Pine St./Highway 99 intersection, new traffic signals, preparation of an access management plan, and right-of-way acquisition. 2004

US 101 and NE 52nd Street Intersection, Newport, Oregon
Project Manager for this traffic safety project to resolve congestion at the intersection of US Hwy. 101 and NE 52nd Street. The project involved installing traffic signals and crosswalks at all four legs of the intersection, constructing ADA curb ramps, and re-routing traffic. The concrete curb and median south of 55th Street on Hwy. 101 was removed, allowing for longer traffic queues in the center turn lane for left turns onto 55th Street. 2004

Agness/Gladiola, Grants Pass, Oregon
Project Manager/Roadway Design Team leader for design of a new City street in the City of Grants Pass. Work included all roadway design engineering and survey for preliminary and final plans that included design of a new at-grade railroad crossing preparation of right-of-way maps and descriptions for new railroad easement and road right-of-way, storm drain design, and ODOT Rail Order. 2001

Jim Colton, PLS — OBEC – Eugene

Survey Group Manager

Jim Colton, PLS, is responsible for project coordination, project management, scheduling field crews, and QA/QC. He is experienced in a full range of advanced and traditional survey techniques and tasks including GPS network control projects, route surveys, and right-of-way acquisition. He is skilled in the use of GPS and electronic survey software for creating alignments and processing field codes and has many years of experience performing boundary, construction, cadastral, ALTA and topographic surveys. Jim's expert leadership ensures that each survey task is completed on time and within budget and that all project deliverables fully comply with all applicable standards and specifications.

Relevant Project Experience

Hazel St.: 9th to East of 10th, Central Point, Oregon
Survey Project Manager responsible for survey services on this improvement of a one-block section of Hazel Street. Improvements include reconstructing the existing gravel street with new curb, gutters, sidewalk, asphalt pavement, and new storm drainage facilities. Ongoing

Middle Fork Willamette River Loop Path, Springfield, Oregon
Survey Project Manager for the design of four miles of multi-use path for Willamalane Park & Recreation District in Springfield. OBEC conducted a feasibility/alingment study and is providing final design for the path along the Middle Fork of the Willamette River, connecting Doris Living History Ranch with Clearwater Park. Work includes all permitting, structure design for two creek crossings, and trailhead design with restrooms. Ongoing

Kokanee Dr.: Industrial Pkwy. – Fish Hatchery Rd., Oakridge, Oregon
Survey Project Manager responsible for survey work related to the stormwater design and management for the design of a 34-foot-wide roadway with curb and gutter and asphalt pavement. The project is part of the development of the industrial park in the City of Oakridge. Ongoing

I-5 Gateway Pedestrian Bridge and Interchange Structures, Eugene, Oregon
Survey Project Manager for the design and construction of several interchange structures including both vehicle and pedestrian/bicycle improvements. Survey work included utility mapping; establishing a horizontal and vertical control network (HVCN); and right-of-way, topographic, and planimetric surveys for the interstate route corridor. The flyover and interchange structures provide efficient vehicle circulation to business routes and the 530-foot-long cable-stayed pedestrian bridge provides a key connection for non-motorized travel between Eugene and Springfield. 2009

69th Street, Thurston Road to B Street, Springfield, Oregon
Survey Manager for the reconstruction of 2,400 feet of 69th Street between Thurston Road and B Street. Project included new concrete pavement for the roadway surface, new curb and gutters, bike lanes, sidewalk, street lighting, roadway striping, and improvements to the existing storm drains. 2009

Years of Experience: 31

Education
- Coursework, Northern Arizona University, and, Diploma, International Correspondence School – Surveying and Mapping, 1983

Special Training
- Trimble Certified GPS Training, 2003, 2005, 2007, & 2008
- RW Acquisition Specialist Training – ODOT

Registration
- Professional Land Surveyor, Oregon PLS No. 58756 (1999)

Expertise
- Senior Surveyor/Party Chief
- Boundary, control, location topographic surveys
- Right-of-way retracements
- Construction staking

Professional Affiliations
- Professional Land Surveyors of Oregon
- Oregon GPS Users Group
- National Society of Professional Surveyors

Stayton Water System Improvements, Stayton, Oregon
Survey Project Manager responsible for survey services as part of the design and evaluation of the 0.4 MG Regis Tank, the preliminary and final design of relocating the 1.0 MG schedule "M" reservoir, and other structural items involved with the water system improvements. 2009

Robert Duff Water Treatment Plant, Rogue River Intake Improvements, Medford, Oregon
Survey Project Manager responsible for survey services as part of the seismic retrofit and structural design for improvements to the existing water treatment plant intake. 2008

Corvallis Rock Creek WTP Tank Location Survey, Corvallis, Oregon
Survey Project Manager responsible for survey services required to develop the final design elements for the Corvallis Rock Creek Water Treatment Plant tank site. Services included project setup, location and planimetric site survey, establishing a horizontal and vertical control network (HVCN), quality assurance, and preparation of deliverables including an AutoCAD Digital Terrain Model (DTM) contour base map. 2008

Hayden Bridge Filtration Plant (Phase 2) Expansion, EWEB, Springfield, Oregon
Survey Project Manager responsible for survey work related to the 12.5 MGD expansion of the existing 75 MGD filtration plant. Major structures include a 94 foot by 189 foot by 17 foot (2.2 MG) cast-in-place concrete settling basin, two new elevated 31 foot by 37 foot by 19 foot sand filters, coagulant chemical building, and associated piping and modifications to the water treatment plant. 2008

Mountainview Reservoir Monumentation and Boundary Survey, Oregon City, Oregon
Survey Project Manager responsible for boundary survey for the outer contiguous boundary and a monumentation survey to replace previously found and tied monuments which were destroyed during construction improvements of Mountainview Street. 2008

53rd Avenue Extension, Albany, Oregon
Survey Group Manager responsible for coordinating field and office activities, project research, and right-of-way retracement of three roadways and one railroad; stamping of the horizontal control; recovery and retracement; survey and legal descriptions; and exhibit maps for right-of-way and easement acquisition. 2008

9th: N. Hazel Street – N. Tenth Street, Central Point, Oregon
Survey Project Manager for this award-winning project to make full street and water system improvements to five city blocks of existing residential gravel streets in the City of Central Point. Project included installation of more than 1,800 feet of new 8-inch ductile iron water main, numerous tapping sleeves, new fire hydrants, mainline blow-off assemblies, air release valves, and replacement of more than 20 existing residential water service connections. This project also included providing new storm drainage system, retaining walls, curbs, sidewalks, pavement sections, signing, and striping. 2007

Wagner and Colver Street Improvements, Talent, Oregon
Survey Project Manager responsible for survey services related to this bicycle and pedestrian safety and mobility road improvement project. Key elements of the project included widening the existing street to accommodate bike lanes, adding sidewalks, installing storm drainage facilities to meet current standards, and replacing 2,000 feet of existing water line. The project also involved close coordination with impacted utilities and with the ODOT Rail Section to ensure minimal impact to the railroad during roadway and waterline construction. 2006

21st Street: "J" Street to "D" Street, Springfield, Oregon
Survey Manager responsible for the survey work for the reconstruction and widening of 2,200 feet (approximately six blocks with six intersecting streets) of 21st Street and construction of new storm sewer. The two-lane roadway varies in width from 38 feet to 46 feet, curb-to-curb, with asphalt surfacing, curbside sidewalks, and on-street parking. Illumination and permanent striping and signing were also included. 2006

Vine Street – Maple Street, Lebanon, Oregon
Survey Manager responsible for work related to the improvements to four blocks of Main Street (Santiam Highway) in Lebanon, including new intersection bulb-outs with sidewalks, curb and gutter, tree grates, new catch basins, bike shelter, and restrooms. 2005

Doug Appel, PE — OBEC – Eugene

Senior Project Engineer

Doug Appel, PE, has extensive environmental compliance, engineering, and construction experience that includes having worked as inspector/resident engineer on numerous bridge projects and having performed design, inspection, and environmental compliance on more than 400 bridges. He leads the firm's environmental design and permitting work, performing hydrology and hydraulic analysis, environmental design, permit compliance and coordination with resource agencies. Doug works closely with all subconsultants providing additional support and technical QC to ensure critical permitting is properly completed prior to project bid dates.

Relevant Project Experience

N. Leadbetter Extension Overcrossing, Portland, Oregon
Permitting Manager for the final design and construction assistance phases for the N. Leadbetter Road Project. The roadway serves several key property owners in the Rivergate Industrial District and has an at-grade crossing of one BNSF Railroad line. The new structure will consist of a seven-span 676-foot-long precast, prestressed bulb-T beam approach spans and a precast slab span with a cast-in-place deck over the railroad. Ongoing

Middle Fork Willamette River Loop Path, Springfield, Oregon
Project Engineer providing environmental permitting for 4 miles of multi-use path for Willamalane Park & Recreation District in Springfield. OBEC conducted a feasibility/alignment study and is providing final design for the path along the Middle Fork of the Willamette River, connecting Doris Living History Ranch with Clearwater Park. Work includes all permitting, structure design for two creek crossings, and trailhead design with restrooms. Ongoing

Freeman Road Improvement Project, Central Point, Oregon
Permitting Manager for this reconstruction of approximately 0.5 miles of arterial roadway near downtown Central Point. The project entails widening Freeman Road to three lanes including bike lanes; addition of sidewalks, curb and gutter, and pavement reconstruction; reconstruction of seven separate intersections and numerous residential driveway connections; installation of a precast box culvert and expansion of the existing storm sewer system; new signing and roadway striping; relocation of existing overhead and underground utilities; traffic analysis; and right-of-way acquisition services. Ongoing

2nd Avenue over Periwinkle Creek, Albany, Oregon
Project Engineer responsible for environmental permitting for this extremely constrained urban stream. The project consisted of the removal of a failing arch culvert and fill, restoration of the stream channel, and construction of a new water line. The project accommodated reconnection of the City water line across the bridge; opened the channel to unobstructed flow conditions, and improved the stream quality enriching fish rearing habitat. 2008

I-205: Willamette River Bridge – Pacific Hwy (Unit 3), Clackamas and Washington Counties
Project Engineer assisting in the investigation and design of stormwater collection and treatment facilities for this $43 million freeway reconstruction project. Authored the Water Resources Report and coordinated work of environmental consultants to obtain environmental and planning approvals from Federal and State agencies and several local jurisdictions. 2008

Years of Experience: 39

Education
- BS, General Engineering, University of Portland, 1964

Registration
- Civil Engineer, Oregon PE No. 8446 (1975)
- Civil Engineer, Idaho PE No. 4750 (1983)
- Civil Engineer, Washington PE No. 23290 (1986)
- Civil Engineer, California PE No. C-40306 (1986)
- Technical Lead for Environmental in the ODOT CS^3 Certification Program.

Expertise
- Founder/Owner, AES Engineers for 23 years
- First Place, Special Projects, Asphalt Paving Association of Oregon, 1995
- Master planning/civil engineering for Peace Health Site, Eugene, Oregon
- Design of hog fuel handling structures for Kettle Falls Generating Plant, Washington

Professional Affiliations
- Professional Engineers of Oregon (President 1989-1990)
- National Society of Professional Engineers (NSPE)
- American Society of Civil Engineers (ASCE)

I-5: Springfield – Creswell Hwy. Interchange, Lane County
Project Engineer responsible for coordinating work with environmental consultants to obtain Corps of Engineers and Oregon DSL permits, in an unusually short time frame, for this freeway interchange replacement and reconfiguration project. Several wetlands were located within the proposed construction limits, and there were concerns about the possible presence of Native American artifacts. In addition to the overcrossing structure, two existing freeway bridges over Hill Creek were repaired; and the Oregon Avenue Bridge over Hill Creek replaced. 2008

Emigrant Creek (Dead Indian Memorial Road), Bear Creek (West Valley View Road), and Bear Creek (Oak Street) Bridges, Jackson County
Project Engineer responsible for coordinating environmental consultants to obtain Oregon DSL and Corps of Engineers permitting and attain Endangered Species Act compliance for three Jackson County bridge projects crossing Bear Creek, which contains listed salmon species. 2008

N. Yamhill River (Meadow Lake Road) Bridge, Yamhill County
Project Engineer responsible for coordinating environmental consultants to plan mitigation and to obtain the necessary Crops of Engineers and Oregon DSL permits for this bridge replacement project that involved considerable temporary environmental impacts to a salmonid bearing stream. 2007

Sunnyside Road Improvement Project – Phases 2 & 3, Clackamas County
Project Engineer responsible for coordinating work with environmental consultants to obtain the multiple studies needed to attain Endangered Species Act compliance and relevant permits from Oregon DSL and the Corps of Engineers for this major arterial improvement project. 2007

I-5 Row River and Overflow Bridges, Cottage Grove, Oregon
This project involved four freeway bridges, with considerations for wetlands, endangered fish and other listed plant and animal species in the vicinity. Coordinated work with environmental consultants to obtain multiple studies needed to attain Endangered Species Act compliance, obtain relevant permits from Oregon DSL and the Corps of Engineers, and to obtain floodplain and riparian area planning approvals. 2007

Boeckman Creek Culvert Replacement, Wilsonville, Oregon
Project Engineer providing environmental permitting for this stream restoration project. The creek was restored to improve fish passage and water quality and to provide a safe ADA-accessible pedestrian path/bridge crossing Boeckman Creek. 2006

Zigzag River (E. Lolo Pass Road) River, Clackamas County
Project Engineer responsible for providing environmental permitting for this bridge with significant Endangered Species Act issues and intense neighborhood interest. The project included designing stream-like restoration and stabilization using large word, rock, and plantings. 2006

Lowell Covered Bridge Rehabilitation Project, Lane County
Project Engineer responsible for coordinating numerous Federal, State and local government entities, including Corps of Engineers, National Marine Fisheries Service, U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Oregon Department of State Lands, and Lane County to attain Endangered Species Act compliance and obtain permits for the reconstruction of this historic covered bridge. The project involved both on-site and off-site mitigation efforts, a tight time schedule, and multiple fish and wildlife species, and design of the on-site mitigation area. 2006

Milton Way Bridge, St. Helens, Oregon
Project Engineer responsible for working with environmental subconsultants to design off-site mitigation for wetland and waters impacts to reach an agreement with the State Historic Preservation Office for removal and preservation of the existing historic bridge and to obtain the necessary Corps of Engineers and Oregon DSL permits. This project is located within a wetland and riparian area, which was extremely constrained by existing residential development. 2005

James Stupfel — OBEC – Eugene

Environmental Specialist

James Stupfel brings a range of permitting and compliance expertise to each transportation and municipal infrastructure project. His experience includes permit coordination and environmental compliance consulting on numerous bridge and roadway projects. James has worked closely with multiple local, state, and federal agencies, as well as with private organizations, to ensure timely, cost effective, and environmentally conscious project delivery while maintaining project goals, objectives, and schedule. His experience includes COE/DSL removal/fill permitting, local land use permitting, DEQ 401 certification, erosion and sediment control requirements, fish passage, stormwater treatment, and railroad coordination and permitting. James also has construction experience, including on-site environmental compliance and reviewing demolition, isolation, and erosion control plans.

Relevant Project Experience

N. Leadbetter Extension Overcrossing, Portland, Oregon
Environmental Specialist and Railroad Coordinator for the final design and construction assistance phases for the N. Leadbetter Road Project. The roadway serves several key property owners in the Rivergate Industrial District and has an at-grade crossing of one BNSF Railroad line. The new structure will consist of a seven-span 676-foot-long precast, prestressed bulb-T beam approach spans and a precast slab span with a cast-in-place deck over the railroad. OBEC is providing environmental coordination and QC of environmental documents including BA for stormwater, noxious weed plan, rare plant documentation, and hazardous materials assessment. Ongoing

N. Going Street Bridge Seismic Strengthening, Portland, Oregon (ODOT)
Environmental Specialist for the strengthening of this 1930s UPRR railroad overcrossing structure. The strengthening will be achieved by connecting the three components of the bridge superstructure, consisting of the (original bridge plus two adjacent widening structures). In addition, the existing sidewalk, bridge rails, and approach guardrails will be replaced. OBEC is providing design, permitting, traffic staging plan, and construction engineering. Ongoing

Middle Fork Willamette River Loop Path, Springfield, Oregon
Environmental Specialist for the design of four miles of multi-use path for Willamalane Park & Recreation District in Springfield. OBEC conducted a feasibility study and is providing final design for the path along the Middle Fork of the Willamette River, connecting Doris Living History Ranch with Clearwater Park. Work includes all permitting, structure design for two creek crossings, and trailhead design with restrooms. Ongoing

53rd Street Extension, Albany, Oregon
Performed permitting and compliance documentation for the 4,700-foot, three-lane roadway extension from the intersection with Highway 99E to Ellingson Road. The project also includes a grade-separated crossing of the Union Pacific Railroad (UPRR) mainline tracks approximately 1,200 feet east of Highway 99E. The project was designed on an accelerated schedule to accommodate a major industrial development on 53rd Avenue. 2008

Years of Experience: 2

Education
- BA, Environmental Studies Carroll College, Helena, Montana, 2006

Expertise
- Project Environmental/Permit Coordinator
- COE/DSL Permit Application
- ODFW Fish Passage
- Local Land Use Permitting
- Construction Compliance
- Railroad Permitting

Freeman Road Improvement Project, Central Point, Oregon
Environmental Specialist for this reconstruction of approximately 0.5 miles of arterial roadway near downtown Central Point. The project entails widening Freeman Road to three lanes including bike lanes; addition of sidewalks, curb and gutter, and pavement reconstruction; reconstruction of seven separate intersections and numerous residential driveway connections; installation of a precast box culvert and expansion of the existing storm sewer system; new signing and roadway striping; relocation of existing overhead and underground utilities; traffic analysis; and right-of-way acquisition services. Ongoing

Ayers Creek Bridge Replacement and Detour Bridge, Yamhill County
Provided environmental and permit coordination for County bridge replacement project. Flooding disabled the bridge prior to project implementation and County received emergency funding through ODOT to replace the structure. Provided coordination to ensure ODOT/FHWA Local Agency Project requirements were met, particularly additional historical resource and hazardous materials documentation. Project involves significant in-water work and scour mitigation. Ongoing

West Lane Road Freight Route Improvements, Columbia County
Environmental Specialist for this 1.33-mile-long roadway project, widening the roadways from 22 feet to 32 feet. The project also includes the realignment of the West Lane Road/Honeyman Road intersection to accommodate southbound trucks accessing US 30 from Honeyman Road. Work consists of design, utilities, geotechnical, survey and mapping, permitting, environmental, right-of-way legalization and acquisition, traffic control, and construction management. Ongoing

Siletz River (Logsden Road) Bridge, Lincoln County
Coordinated environmental consultants and efforts to obtain COE and DSL removal/fill permits for bridge replacement project over extremely high value natural and recreational resource. Worked closely with engineer, contractor, and resource agencies to obtain an extension to the short in-water work window. Currently providing assistance for construction phase of project to ensure environmental compliance and to minimize construction impacts. 2008

Brown Detour Bridge, Douglas County
Coordinated environmental and permit requirements for two phase bridge replacement project. Led successful efforts to obtain permits and ESA documentation for accelerated detour bridge and follow up replacement bridge projects. Worked closely with resource agencies and project engineers to ensure project compliance with NMFS, DEQ, and other agency's requirements. This was one of the first projects permitted under the SLOPES IV transportation Biological Opinion. Responsible for coordination of environmental sub-consultants and for obtaining all necessary permits and environmental clearances including DEQ stormwater coordination and 401 certification, archaeological, and historic resource coordination and documentation for ODOT/FHWA, COE and DSL removal/fill permits, floodplain permit, and fish passage. 2008

Palmer Creek Bridge Repair, Yamhill County
Environmental specialist responsible for ensuring all permits and environmental documentation was in place for County bridge substructure repair project. Coordinated COE and DSL permit applications and approvals. Oversaw consultant work to clear project for ESA listed species and cultural resources impacts. 2008

Sunnyside Road Improvement Project – Phase 3, Clackamas County
Environmental Specialist responsible for coordinating with environmental consultants to obtain the multiple studies needed to attain Endangered Species Act compliance and relevant permits from Oregon DSL and the Corps of Engineers for this major arterial improvement project. 2007

I-5: Wilsonville – Hayesville Interchange Design-Build, Bundle 211, Clackamas and Marion Counties
Environmental Specialist for this $23 million design-build project comprised of twin bridge replacements in addition to 3R pavement preservation work on a 22.2-mile interstate freeway corridor. 2007

Garrick Doll, QCCS — OBEC – Eugene

Sr. Field Engineering Technician/Quality Control Compliance Specialist (QCCS)

Garrick Doll, QCCS, is a construction engineering technician with a range of construction inspection experience. Garrick's key role in OBEC's construction projects is quality assurance oversight as well as performing on-site conflict resolution. His specialized QCCS expertise includes all types of paving and roadway resurfacing and reconstruction as well as bridge and structure construction. Garrick's responsibilities at OBEC include construction inspection, construction surveying, project administration, and quality and quantity documentation. He routinely provides expert reviews of quality control procedures and documentation on a range of construction projects.

Relevant Project Experience

Marcola Road (Mohawk River) Bridge, Lane County
Inspector and QCCS for this project that involved replacement of a reinforced concrete girder bridge that had shear cracking and load restrictions. The project was located on Marcola Road and crossed the Mohawk River 5 miles north of Springfield, Oregon. The new 380-foot bridge consists of 3 spans of prestressed concrete girders setting on driven piling and 6-foot diameter columns. The project included extensive realignment of the roadway to allow construction of the new two-lane bridge, without interrupting normal traffic from the Mohawk Valley. 2003

69th Street: Thurston Road to "B" Street, Springfield, Oregon
Lead Inspector for this project that involved final design and construction engineering and inspection services to address failing on approximately 2,400 feet of 69th Street. Design phase services included survey, utility coordination, and roadway and striping design. Construction engineering included all inspection and QA/QC services. 2009

Glenwood Blvd. – McVay Highway, Springfield, Oregon
Lead Inspector for this roadway project that included the construction of sidewalks, bike lanes, landscaped setbacks and illumination along Franklin Boulevard from Brooklyn Avenue to McVey Highway. The project also involved incorporation of access control along the south side of Franklin Boulevard. Work included overall project management; right-of-way map, descriptions and staking; utility coordination; Phase 1 hazardous materials investigation; and preparation of contract plans and specifications. The City of Springfield provided right-of-way acquisition, pavement design, illumination design, traffic signal loop design, signing and striping design. 2006

Eugene Train Depot (Unit 2), Eugene, Oregon
Lead Inspector for the site improvements at the Eugene Train Depot. The City of Eugene has received Federal Transportation Funds to update the site master plan and make site streetscaping, pedestrian, bicycle, and parking improvements and add other amenities to enhance multi-modal service to the public and create a safe and easily recognized public transportation service center. OBEC is providing site surveying, preliminary and final design, and architectural services. Ongoing

Years of Experience: 22

Education
- U.S. Navy – Various Technical Schools, 1985-1994

Registration
- Engineer-in-Training, Washington No. 25720

Certifications
- Special Inspector Reinforced Concrete, ICBO
- Nuclear Moisture-Density Gauge, ODOT-CDT
- Aggregate Testing Tech, ODOT-CAgT
- ACI Concrete Field Tech – Grade 1, ODOT-QCT
- Embankment Tech, ODOT-CEBT
- Asphalt Tech – Grade 1, ODOT-CAT-1
- HE02 Hard Hat Diver
- ODOT Certified QC Technician No. 41591
  - Certified Aggregate Technician
  - Certified Embankment Technician
  - Certified Asphalt Tech. 1
  - Certified Density Technician
  - Certified Bridge Construction Inspector
  - HMAC Inspector
  - Erosion Control Inspector
  - Drilled Shaft Inspector
  - General Construction Inspector

Expertise
- Construction Management/ Inspection
- Quality Control Documentation
- Contractor Relations

21st St: Main to Centennial Blvd. Springfield, Oregon
Lead Inspector for this 2,200-foot-long roadway preservation project. The project included replacement of the existing deteriorated pavement and widening the roadway to 38 feet. OBEC provided construction engineering including project staking, inspection, QA/QC documentation and contractor monitoring and payment. The project was completed on schedule and under budget. 2006

US 26: North Plains to 185th, Washington County
Lead Inspector for this 2.3-mile-long 3R preservation project. The project involves pavement preservation including upgrades to nine signalized intersections; ADA ramp improvements; Biological Assessment; noise variance for nighttime work; local agency permits; and signing, striping, and traffic control. Ongoing

Hazel Street: 9th to East of 10th Paving, Central Point, Oregon
Lead Inspector for this Federally-funded CMAQ paving project. OBEC provided project management, survey, and road and pavement design services. OBEC will provide construction engineering and inspection services. Ongoing

OR8: N. 10th Ave. – N. 19th Ave., City of Cornelius
Lead Inspector for the Phase 2 improvements in downtown Cornelius. OBEC is providing construction project management, on-site inspection, labor compliance monitoring, subcontract review, monthly progress payment estimates and associated project completion documents. OBEC is working as part of an integrated project team with City staff and the design consultant to ensure quality in the constructed project, compliance with Federal-Aid requirements and that the City's goals are met. Ongoing

New Hope Road Federal Stimulus Paving Project, Josephine County

Lead Inspector for this fast-tracked, ARRA-funded 1R paving preservation project on New Hope Road in Josephine County. The project involves four miles of pavement overlay and includes guardrail upgrades at three locations. 2009

Courthouse District Transportation Improvements, Eugene, Oregon
Lead Inspector for this transportation improvement project surrounding the new Federal Courthouse in the City of Eugene. Work included vehicular and pedestrian access improvements, paving, and pavement preservation. New roadway sections, traffic signals, illumination, underground utilities, and storm drainage improvements were included. 2008

Alley Reconstruction and Paving, Medford, Oregon
Lead Inspector and QCCS for the construction and paving of several alleys in Medford including excavation, aggregate base, asphalt concrete paving, concrete curbs, sidewalks and driveways, and drainage pipes and structures. CE tasks for this Federally-funded project included project management and coordination, attending and participating in project meetings, inspection of roadwork and grading, and associated documentation including as-built markups. 2007

Hwy. 213/Beaver Creek Road Bridge, Oregon City, Oregon
Lead Inspector for this highway and intersection reconstruction project. This Federal-aid project consisted of widening and upgrading 3,250 feet of Hwy. 213 and 2,625 feet of Beavercreek Road. Project elements included roadway and structure design; sidewalk improvements; stormwater drainage; landscape and irrigation; MSE walls; off-site mitigation for a 15-foot-diameter culvert and associated roadwork; two new traffic signals; temporary traffic control and staging plans; illumination; right-of-way mapping, descriptions, and acquisition; and contract administration and inspection. 2005

Ferry Street Bridge, Eugene, Oregon
Inspector and QCCS for the roadway improvement portion of this project. Responsibilities include quality control compliance specialist/inspector for this 30 million dollar project that included six structures, with a state-of-the-art suspension bridge; 1.5 miles of urban road design; and environmental issues. Roadwork involved resurfacing existing streets and new road design, landscaping, drainage, erosion and traffic control, embankments, widening, staging, and utility relocations. 2001

LESLIE D. (BENCKENDORF) FINNIGAN, SR/WA

Qualifications

Leslie has over 23 years experience in the Right of Way field. She currently is involved in all phases of the land acquisition and relocation process in a management capacity. She is responsible for business development in Oregon, SW Washington and Idaho and overall corporate project oversight of Universal's projects in the Region.

Experience

1998-Present **Universal Field Services, Inc., SW Washington, Oregon & Idaho Regional Manager**

Leslie is responsible for overview of projects in Southwest Washington, Oregon and Idaho including staffing, and contracting with subcontractors (appraisers, environmental firms, surveyors, clerical firms, etc.) and periodic quality assurance reviews on current projects to verify compliance with Federal regulations and Universal's internal audit requirements.

Leslie has managed a variety of projects in Oregon and Washington, including projects in Douglas County, Clackamas County, Washington County, Deschutes and Clark County Washington and for such agencies as Tri-Met in Portland and Lane Transit District in Eugene.

Projects Include:
Waterfront Access Project, City of Vancouver
E Street Improvement Project, City of Washougal
Ridgefield Rail Overcrossing Project, Ridgefield
Pine Street – City of Sherwood
Blaine Road – Phase 2 – Tillamook County
Blaser Bridge Replacement – Tillamook County
Highland-Glacier Couplet (Redmond) – ODOT Region 4
Kings Valley Highway (Dallas) – ODOT Region 2
Hwy 99E (Halsey) – ODOT Region 2
99W @ Territorial Hwy (Monroe) – ODOT Region 2
Seven Oaks Interchange (Medford) – ODOT Region 3
I-5 @ 99 E (Canyonville) – ODOT Region 3
OR 204: Elgin City Section (Elgin) – ODOT Region 5
N. Interstate Max – TriMet
I-205 Light Rail Project - TriMet
170th Avenue – Washington County
N. Albina Overcrossing – City of Portland
Padden Parkway – Clark County
4th Plain Road – Clark County
Gaarde Street – City of Tigard
West Main Street – City of Battle Ground
SW 27th Street – Redmond
Raw Water Pipe Project – City of Hillsboro
Odem Medo Road – City of Redmond

1996-1998 **Washington County, Oregon, Right of Way Project Manager**

Acquired right of way and managed a variety of projects for Washington County, including the East Main Street Project in Hillsboro, the Evergreen Road Waterline Project, a joint project between the County and the City of Hillsboro and the Highway 47 Bypass.

1991 - 1996 **Oregon Department of Transportation - Senior Right of Way Agent**

1994 -96 ODOT Region 2 Project Manager ~ Managed, acquired and sold real property for a variety of projects, including the widening of I-5 through North Salem; the Stafford Road Interchange Project on I-5 in Tigard; Realignment of Hwy 35 between Corvallis and Newport and a Transit Mall Project in Eugene.

1991-1994 **ODOT Condemnation Liaison – Senior Right of Way Agent**

Worked on a variety of condemnation files in conjunction with the Oregon Department of Justice. Negotiated and resolved files that were headed for trial prior to the court proceedings.

1986-1991 **Oregon Dept Transportation - Right Of Way Agent**

Worked on a variety of right of way projects and files, both rural and urban. Appraised, acquired and provided relocation assistance, both business and residential.

Education

WESTERN OREGON UNIVERSITY (Formerly OCE) - Monmouth Oregon 1969-1973

Related Courses - Numerous International Right of Way Association courses and National Highway Institute Courses
Mediation training - Institute for Conflict Management

Affiliations - Designations

Principal Real Estate Broker – Oregon 981000095
Senior Designation (SR/WA) with International Right of Way Association
Past Region 7 Chair for International Right of Way Association
Region 7 Representative on International Local Public Agency Comm (IRWA)
Oregon Chapter 3 President International Right of Way Association 1996
Oregon Professional of the Year 1992
Member of Oregon Chapter 3, IRWA 1987 to Present
Member, American Public Works Association, 1998 to Present
Member, American Council of Engineering Consultants

QUALIFICATIONS AND EXPERIENCE

Name	David J. Collins
Professional Registrations	Professional Engineer: Oregon
Education	B.S., Civil Engineering, Portland State University

Summary of Qualifications

- Lead modeler on several projects involving combined, sanitary and storm sewer alternative analysis and design
- An expert at developing and executing processes for integrating hydrologic, hydraulic and water quality models with geographic information systems (GIS)
- Extensive experience developing flows for pump station facilities planning and design
- Main author of various data management applications to build models and QA/QC data
- Experienced in gravity and pressure conveyance analysis and design

Representative Project Experience

Project Management and Technical Support, City or Portland, Oregon: Mr. Collins is currently working under a multi-year contract to provide project management and technical services to the Bureau of Environmental Services' (BES) Systems Analysis group. He has been in a lead technical role or provided senior review on the following types of projects: Sanitary Sewer System Plan update, Eastside and Westside CSO tunnel sizing and design, neighborhood projects to reduce storm water contributions to the combined system, separated sanitary sewer infiltration and inflow reduction, emergency sewer repair projects, pump station upgrades, combined sewer interceptor design.

Hydraulic Analysis Tool Development, City or Portland, Oregon: Mr. Collins is a member of the technical team that has designed and implemented the modeling and analysis tools used by BES System analysis. He authored significant modules of the software used to convert GIS data into XP-SWMM and DHI-MOUSE/MIKE-URBAN models. This software, known as EMGAATS, is now the BES standard for combined sewer analysis and was used to size the east side CSO tunnel, currently under construction. Mr. Collins developed the EMGAATS module to evaluate the benefits of inflow controls. He worked closely with the author of the RESTORE decision tool to modify and apply the tool to the 2005 Portland Watershed Plan. As project manager of the Sanitary System Plan Update, Mr. Collins developed the technical approach and coordinated the implementation of the tools and processes used simulate infiltration and inflow in the separated sanitary system. He has worked with the BES standards and practices committee to coordinate hydraulic and hydrologic analysis methodology with BES design standards.

Wastewater Pumping and Conveyance Facilities Analysis, Metropolitan Wastewater Management Commission, Eugene Oregon: A series of pump stations discharging to common parallel force mains required upgrading to handle wet weather flows and projected development. The purpose of the analysis was to determine how much additional discharge could be pumped with existing pump stations and pipelines.

The analysis included a review of pump capacities and operations, pump station as-builts, and pump performance data. Rainfall data and flow monitor data were analyzed to estimate the flow resulting from a 5-year recurrence interval storm. Using the EPA-NET hydraulic model, Mr. Collins determined the pump capacity required to run the existing force mains under increased flow pressure. A review of the force main as-builts indicated the pipelines were rated to operate under the increased pressure. A technical memorandum documenting the analysis and conclusions was produced.

Fanno Basin Sanitary Sewer System Analysis, City of Portland/Clean Water Services, Oregon: The Fanno Basin is served by both Portland BES and the Clean Water Services. The Fanno Pump Station is a high head facility that pumps sewage to the collection system served by Portland's Columbia Boulevard Treatment plant. The Fanno Basin service areas of both agencies experience unusually high rates of infiltration and inflow (I/I) and related conveyance capacity problems.

As the Portland sanitary sewer system plan task manager, Mr. Collins establishing a flow monitoring plan and managed the development and calibration of hydraulic and RDII models used to characterize the Fanno Pump Station basin collection system capacity. The models calculated local I/I rates for thirty individual subcatchments within the Fanno Pump Station basin service area and characterized capacity issues within the Fanno Pump Station basin.

These capacity problems were exacerbated by the recent failure of the Fanno Pump Station force main. When it became apparent that the force main repair would be a multi-year effort, an interim wet weather mitigation strategy was developed that included warning levels set that would trigger the decision to initiate a temporary pumping system to minimize uncontrolled sanitary sewer overflows. Mr. Collins provided the technical analysis of flow monitor data and modeling required for BES and CWS to formulate and refine the wet weather management strategy. This analysis included conversion of an un-calibrated CWS HYDRA model to XP-SWMM and the creation of a calibrated RDII and hydraulic model of the CWS Fanno Trunk system.

Mr. Collins is currently developing a long-term plan for the Fanno Pump Station and Burlingame basins as well as and managing the hydraulic analysis in support of conveyance projects to constructed over the next two to four years. The long-term plan will coordinate I/I reduction efforts with stormwater management projects.

Outfall 27 CSO Control Project, City of Portland, Oregon: Portland is on schedule to limit combined sewer overflows (CSOs) to once in three summers and four times per year in the winter by December 1, 2011. The Sellwood, Western Lents, and Lents combined and the Johnson Creek and South Lents separated sanitary sewer basins discharge to an outfall that will not be controlled by the Willamette CSO tunnel system. The Outfall 27 project will achieve CSO control by storing peak flows associated with intense storms in an existing large diameter sewer and pumping the stored flows after storm has passed. Major project elements include an 8 cfs pump station, diversion structure and vortex drop structure. Mr. Collins was responsible for calibrating and applying the hydraulic models used in the analysis to determine initial feasibility. During predesign, he coordinated the analysis of several projects to achieve a solution that optimized storage, minimized pumping requirements, and protected downstream facilities from excess surcharge during extreme events. Mr. Collins provided the hydraulics background to value engineering study of this project and he is currently supporting the 30% design of this project.

Balch Consolidation Projects, City of Portland, Oregon: The Balch Basin is a combined sewer basin with industrial commercial and residential areas. The Balch Consolidation Conduit (BCC) and related projects include an 84-inch diameter BCC tunnel, consolidation structures, and open cut pipelines required to route all combined flow to the CSO tunnel system by December 1, 2011.

Mr. Collins has been the modeling lead for this project throughout all preliminary phases including the initial basin characterization, alternatives analysis, pre-design. Mr. Collins refined the explicit modeling approach that is the current standard for the City of Portland in the early phases of this project. The results from the explicit model in the Balch basin led to the decision to apply the explicit modeling approach system-wide.

Mr. Collins is currently managing the hydraulic analysis performed by BES staff in support of the final design. Issues investigated and resolved through the hydraulic analysis included; Statistical analysis to develop a basin design storm hyetograph to represent the joint probability of an extreme event following an event that filled the CSO tunnel, low flow analysis to ensure adequate scour velocities in the BCC and open cut pipelines, vertical alignment alternatives to avoid soft soils are reduce tunneling risk, basement and surface flooding risk analysis. Mr. Collins presented modeling results to the project technical review committee (TRC) at 60% and is currently supporting the 90% design of this project.

Westside Stream Separation Alternatives Analysis and Pre-design, City of Portland, Oregon: Key project elements were verification of basin models calibration for the Carolina, California, Sheridan and Woods combined sewer basins, developing flow reduction alternatives, cost-effective analysis and producing plan and profile sheets for the recommended plan.

M. Collins was the lead modeler for the project and key participant in all phases. He developed SWMM RUNOFF, SCS hydrology and EXTRAN models during the calibration phase. Mr. Collins performed field reconnaissance, produced site maps and led a field trip for the advisory committee. He developed processes that used GIS data as the basis for cost analysis and CAD plans from modeled alternatives.

The Santa Barbara Urban Hydrograph (SBUH) method was used to develop design flows for both pipe capacity and water quality treatment capacity. A QA/QC process revealed that results from the XP-SWMM implementation of SBUH were inconsistent with King County methodology. After working unsuccessfully with XP, he developed a spreadsheet automation tool that created an XP-SWMM input file and results consistent with King County methodology.

Combined and Sanitary Sewer Public Facilities Plan (1999), City of Portland, Oregon: Mr. Collins responsibilities included identifying candidate areas for separation of storm water from the combined system, locating sites for water quality treatment facilities and building conveyance system models used to evaluate alternatives for reducing basement flooding and combined sewer overflows. The City's version of the EPA SWMM model was used to determine if pipe capacity would cause basement flooding and to develop three alternatives to relieve flooding in areas of the city with combined sewers. BES database and (GIS) tools were a critical element in alternative development, evaluation and documentation. Bugs discovered in the SWMM model were identified and solutions found to mitigate problems with the model.

Another element of the project was a capacity analysis of the separated sanitary conveyance system. The 2015 land used population estimates were tabulated using MapInfo. A program was written to load the sewer facilities database and create a flow accumulation model in a series of Excel spreadsheets.

Jenne Road – Pleasant Valley Interceptor, City of Gresham, Oregon: Mr. Collins performed the flow analysis and wrote the hydraulics design report for a 24- to 36-inch sanitary sewer to convey flows from Pleasant Valley area to the Linneman Pump Station. The scope of work included a review of the Gresham Comprehensive Plan, development code, and sanitary sewer design manual. As part of the flow analysis a program was written to calculate design flows directly from Gresham GIS data.

Linneman Pump Station Design Flow Analysis, City of Gresham, Oregon: Mr. Collins performed the flow analysis and wrote the hydraulics design report for this recently constructed replacement pump station. The pump station maximizes the capacity of the existing 18-inch force main with allowances for expansion and use of a new force main to be constructed in the future. The purpose of the flow analysis was to project the existing and build out flows used to size the pump station and force main improvements. A multi-linear regression equation using pump station flow records and local rainfall data was used to estimate infiltration and inflow associated with the design storm. The pump station preformed as designed during the January 1-2, 2009 storm event.

Gresham Trunk Design, City of Gresham, Oregon: The objective of this project was to add adequate capacity to the City's primary sanitary sewer trunks to ensure compliance with Sanitary Sewer Overflow requirements. As the hydraulic modeling task lead, Mr. Collins was responsible for reviewing an existing hydraulic model and updating it based on current data. A problem definition based on the updated hydraulic model formed the basis for an alternative analysis and pre-design. Multiple scenarios were analyzed during the pre-design and design phases to ensure that the ultimate design would provide maximum flexibility for future increase in service area.

Owens Lake Dust Mitigation, Los Angeles Department of Water and Power: The Los Angeles Department of Water and Power (LADWP) contracted with CH2M HILL to design facilities to mitigate for dust blowing from the Owens Lake dry lake bed. Dust control in provided via a combination of shallow flood irrigation to wet the lake bed and managed vegetation to grow salt grass. Mr. Collins performed the hydraulic analysis in support of the design of the freshwater distribution system with a capacity of over 100,000 gallons per minute. He worked closely with CH2M HILL staff to design the managed vegetation drip-irrigation facilities and the brine water collection and reuse system.

Klamath River Total Maximum Daily Load Study, Oregon DEQ: The study area was the reach of the Klamath River between Link River and Keno Dam near Klamath Falls, Oregon. The scope of the study was to construct a CE-QUAL-W2 water quality model for the reach to allow DEQ to determine appropriate loading rates to the Klamath River and in determine the point source load allocations. Mr. Collins compiled water quality, flow, and bathymetric data from a variety of sources into a uniform database from which the CE-QUAL-W2 model could be constructed and to develop tools to post process the model results.

Irrigation Water Control Structure Design and Field Investigation, Nature Conservancy, Lake County, Oregon: This project was a key component of the marsh restoration plan for the Nature Conservancy's 25,000-acre Sycan Marsh Reserve. Sycan Marsh receives runoff from over 300 square miles of tributary basin area. Mr. Collins responsibilities included estimating the useful life and repair costs of flow control structures as well as the design of rehabilitation and replacement options. These cost estimates were used in successful contract negotiations with grazing leaseholders. The structures were constructed in 1995 and have performed well under flood conditions.

Johnson Creek Pre-design, City of Portland, Oregon: A team of consultant and BES modelers developed and calibrated a hydrologic and hydraulic model of the Johnson Creek basin in support of the Johnson Creek Pre-design. As the lead consultant modeler, Mr. Collins was worked with BES modeling and resource planning staff to develop and rank alternatives and refine the selected alternative. His work on the project assisted the team in reaching two key milestones.

The first milestone was to create a running, calibrated XP-SWMM model. Mr. Collins developed the process and led the effort to merge data from three different sources and compiled it into a unified data structure. The database and related application were used to generate a working model.

The second milestone was to develop pre-design alternatives for review by a technical advisory committee (TAC). The data structure developed the previous year was modified to allow tracking of

over 60 individual projects. Working with resource planners, proposed projects were interpreted into model elements in the database. The impact of the projects on downstream flooding was evaluated. Model elements were modified based on advice from the TAC. A difficult schedule was met with 30 percent budget remaining.

Sanitary Service Conveyance Analysis, City of Gresham, Oregon: Mr. Collins was the project manager investigating alternatives for providing sanitary sewer service to tax lots along the Columbia River levee. He developed four alternatives and made recommendations considering planning criteria, utilities, geology, and wetlands impact.

Tryon Creek Facilities Plan, City of Portland, Oregon: Lead modeler in the collection system analysis of Tryon Creek and Fanno Creek basis. The project included building an XP-SWMM model from the City databases, calibrating the model using flow monitor and pump station operations data, identifying priority areas for infiltration and inflow (I/I) removal efforts. The flow monitor data analysis resulted in modifications to the Fanno Creek pump station design capacity.

Sanitary Sewer Modeling, City and County of Honolulu, Hawaii: The City and County of Honolulu was under order from EPA to manage their sanitary sewer overflows. The goal of the project was to create a tool set that would give the City the ability to evaluate the capacity of any point in the collection system to accept flow from potential new sewer connections.

Mr. Collins primary role was to convert Arcinfo, sewer map, and pump station data for the island of Oahu into XP-SWMM models for eleven sanitary sewer basins. The models were used to determine existing flow and remaining capacity for 10,000 pipes. He created a Microsoft Access program to convert the Access data into a format that XP-SWMM would read as input. This tool was later modified for use in building the models for the Johnson Creek Pre-design, Tryon Creek Facilities Plan, and Westside Stream Separation, projects.

Irrigation Pumping and Pressure Pipe Analysis, Potlatch Poplar Project, Boardman Oregon: The Potlatch Poplar Project is a 22,000-acre (34 mi^2) farm that was converted from center pivot to drip irrigation. The project merged two separate farms with a total combined peak flow of 170,000 gpm (240 mgd). Mr. Collins preformed the hydraulic analysis for Phases 2 though 8 of irrigation conversion, mainline hydraulic modeling and various pump station design issues.

He developed a system-wide hydraulic model that was used to determine areas of the farm that would have pressure limitations for the current season and under buildout conditions. The model was built from Arcinfo data using MapInfo with an Access data structure. A dynamic EPA-NET model was created from the Access database and calibrated to three-minute flow and pressure data. Maps were produced from model results showing improvements under various pump station upgrade scenarios.

This model was used to determine pump sizing new of "inter-tie" pump stations build to link the north and south farms, upgrades of existing pump stations and determine the effects of constantly changing flow conditions on the farm due to irrigation scheduling requirements.

Beef-Bend-Elsnor-Scholls-Sherwood Road, Washington County, Oregon: Hydrologic and Hydraulic task lead for the pre-design, final design and services during construction of a five mile long roadway project. The project was located both in rural areas outside of the urban growth boundary and within the City of Sherwood. The design included three bridges, a box culvert with fish passage requirements, several culverts in the 24- to 48-inch diameter range, scour analysis and water quality treatment design in the rural section as well as one mile of urban storm water conveyance design. An existing HEC-2 model was modified to represent changes to the Tualatin River flood plain to determine the effects of flood plain fill.

Stormwater Conveyance Design, Cornelius Pass Road, Washington County, Oregon: Mr. Collins was the hydraulics analysis task lead for the pre-design and final design of the Cornelius Pass Road widening project in Washington County. He created an XP-SWMM model using SCS hydrology to determine peak flows and size pipes and culverts. The design required rerouting of flows from one basin to another to relieve flooding in a residential neighborhood. The design included water quality features as required by Unified Sewerage Agency.

Stormwater Conveyance Design, Clackamas Highway, Clackamas County, Oregon: The purpose of this emergency roadway realignment project was to repair the damage caused by a slide that occurred during the February 1996 flood. As the conveyance design task lead, Mr. Collins performed surface runoff calculations, designed the following facilities: system to remove groundwater from the slide prone area, water quality treatment, inlets, and culverts. The project design was on an accelerated schedule and was delivered on time.

Teton Road at Hedges Creek Stormwater Conveyance Design, City of Tualatin, Oregon: This roadway project was initiated to relieve flooding from Hedges Creek. The project replaced an existing straight channel with a meandering channel and floodplain. A combination of fieldwork and review of previous hydrologic and hydraulic studies led to the replacement of undersized culverts with a prefab bridge. The completed project has improved conveyance while enhancing the wetland characteristics of the area.

Culvert Analysis and Design, Beltline Highway, Eugene, Oregon: Mr. Collins was the conveyance design task lead for this roadway improvement project. He performed a HEC-2 backwater analysis, culvert design, and scour analysis. Working in conjunction with resource managers, he developed a channel and culvert design that incorporated treatments to accommodate the migration of the Western Pond Turtle.

Stormwater Detention Facility Design, Jones Plant, Intel Corporation: This detention pond was designed to limit post-development peak flows to pre-development levels for the 25-year recurrence interval storm. Mr. Collins was responsible for producing design storm runoff hydrographs using HEC-1, stormwater conveyance design and detention facility design for the Jones Farm facility.

Infiltration and Inflow (I/I) Analysis, Wastewater Facilities Plan, The Dalles, Oregon: This work included a statistical analysis of rainfall data to determine the design storm and flow separation and a cost-effectiveness analysis to estimate the most economic level of I/I reduction.

Portland International Airport Deicing Study, Portland, Oregon: This study focused on investigating the environmental impacts associated with deicing and anti-icing practices. Responsibilities included analyzing the stormwater collection system to identify options for controlling deicing fluid in stormwater runoff.

James K. Maitland, Ph.D., P.E., G.E.

Principal/Geotechnical Engineer

Jim Maitland has 32 years of experience as a geotechnical engineer, including 25 years as Principal and Owner of Foundation Engineering, Inc. He has served on numerous civil engineering and geotechnical engineering projects involving site characterizations for a wide range of wastewater facilities. A selected list of his sewer line and lift station project experience includes:

- Geotechnical investigation for construction of a ±6,500 LF section of sewer force main in Netarts, Oregon. The force main was successfully completed using directional borings. Project challenges included excavation of a drilling pit in cobbles on a beach, hilly terrain, more than 300 feet of elevation change and large variations in soil/bedrock conditions along the directional bore alignment.
- Geotechnical investigation and seismic hazard study for a new pump station and force main associated with a proposed wastewater treatment plant for the Netarts-Oceanside Sanitary District (NOSD) in Netarts, Oregon. The new ±3,000-foot long force main will connect the existing wastewater treatment plant with the proposed facility. A second pipeline conveying treated effluent from the new wastewater treatment plant back to the ocean outfall will also be constructed on the same alignment. Directional bores are planned for both pipelines.
- Geotechnical investigation for a series of improvements to the existing wastewater system in Brownsville, Oregon. The improvements include construction of a new 7-acre lagoon and inlet lift station, a new chlorine contact chamber/control building and extensive sewer line replacement. Project challenges included two sewer line crossings of the Calapooia River to connect the new facility with existing lagoons to the north.
- Geotechnical investigations for sewer line projects in Corvallis, including the ±3,000 LF West Hills sewer extension located ±½ mile south of the Benton County Fairgrounds, east of 53rd Street; the ±2,860 LF Skyline West sewer extension located north of Walnut Park; and the ±14,000 LF West Philomath Blvd. sewer line extension, which extended service from 53rd Street to the urban growth boundary west of Corvallis.
- Geotechnical investigation for ±10,000 LF of sewer line along Jackson Highway in Chehalis, Washington.
- Geotechnical consultation, construction observation and testing associated with construction of 14 miles of an 8 to 24-inch diameter sewer system in N. Albany, Oregon.
- Geotechnical investigations and construction-phase observation and consultation for new lift stations and control buildings for wastewater facilities in Corvallis, Junction City, Lafayette, Eugene, Waldport, Philomath, Monmouth, Netarts, Oceanside and Aumsville, Oregon, and in Kelso, Washington.
- Foundation investigations, consultation and construction inspection for sewage treatment plants in Hubbard, Odell, Silverton, Bay City, Jefferson, Toledo, and Philomath, Oregon; Cowlitz County and Castle Rock, Washington; and Pago Pago, American Samoa.

Professional Registration

Oregon - Professional Engineer, Geotechnical Engineer
Washington - Professional Engineer
Idaho - Professional Engineer

Academic

Ph.D. Geotechnical Engineering - Oregon State University - 1977
Master of Civil Engineering - Rice University (Texas) - 1974
B.S. Civil Engineering - Rice University (Texas) - 1973

Experience Summary

1982 to Present — Foundation Engineering, Inc., Corvallis, Oregon, Principal Engineer
1978 - 1982 — Willamette Geotechnical, Inc., Corvallis, Oregon, Principal

Professional Activities

Member, American Society of Civil Engineers (ASCE)
Member, International Society of Soil Mechanics and Foundation Engineering (ISSMFE)

MSA

SECTION 4

Projected Workload

MSA continually strives to achieve an optimal balance between workload and staff resource capacity. MSA tracks, monitors and manages firm resources through a detailed backlog and project scheduling system. The backlog system tracks contracted backlog, provides allowances for potential anticipated work and is then spread over time, resulting in an estimated monthly backlog projected for at least 12 months. Staffing levels are guided by the actual and anticipated backlog of work and the schedule on which that work must be accomplished.

Over the next 12 months, approximately 50 percent or $4.0 million of our firm's capacity at our current staffing level is allocated to contracted work. Another 30 percent or $2.4 million is allocated to selected work that is not yet contracted. The remaining 20 percent or $1.6 million of current capacity is expected to be utilized through future projects that MSA will be selected for. MSA maintains schedule flexibility by having enough qualified staff available to respond to project needs. MSA's management system and techniques allow us to fully commit to meeting tight project schedules with confidence. Our team's recent successful performance on many fast-track projects demonstrates our ability to meet schedules.

We have examined our current backlog and resources relative to the requirements of this prospective project and have determined that we have the ability to respond immediately and complete the work within desired time frames with dedicated, experienced, local staff to ensure continuity throughout the course of the project.

Fee Estimate

The following fee estimate is based on the requirements identified in the City's Request for Proposals as well as on MSA's assumptions and clarifications as presented in the scope of work in Section 4. These assumptions and clarifications include the assumed level of effort, the design, bidding and award and construction schedule, work products and other factors that may affect the fee budget.

MSA proposes to perform the work on a time and expenses basis in accordance with the Schedule of Charges included at the end of this section. This schedule will apply for the duration of the project through construction completion, based upon the assumed project schedule as noted elsewhere in this proposal. The total fee amount can be considered a "not-to-exceed" amount. We would encourage further discussion with the City to confirm the details of the City's project requirements and MSA's assumptions, so that the scope of work and fee estimates can be refined, as may be appropriate.

Task 1 – Overall Project Management and Predesign													
1.1 Project Management and Coordination	8		32	12								4	56
1.2 Investigations and Information Compilation and Review			2	6				16				2	26
1.3 Geotechnical Explorations			2	3		5						2	12
1.4 Identification and Analysis of Various Trunk Sewer Routing Alternatives	4		12	16	10			40		8		6	96
1.5 Identification of Required Permits and Agency Consultations			3	6				16				2	27
1.6 Identification of Easement Needs			2				3	8				2	15
1.7 Preliminary Project Cost Estimating	2		4	8				16					30
1.8 Sewer Route Selection Report	3	2	10	20	2			32				6	75
Task 1 Subtotal	**17**	**2**	**67**	**71**	**12**	**5**	**3**	**128**	**0**	**8**	**0**	**24**	**337**
Task 2 – Field Data Collection and Presentation													
Subtasks 2.1 through 2.11				3				4		4			11
Task 2 Subtotal	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**4**	**0**	**4**	**0**	**0**	**11**
Task 3 – Design													
Subtasks 3.1 through 3.7	10	22	100	180		6	240	280		120	640	16	1614
Task 3 Subtotal	**10**	**22**	**100**	**180**	**0**	**6**	**240**	**280**	**0**	**120**	**640**	**16**	**1614**
Task 4 – Easement and Right-of-Way Acquisition													
4.1 Legal Descriptions and Easement Maps	1		2				8					2	13
4.2 Acquisition of Easements	1		8				8					2	19
Task 4 Subtotal	**2**	**0**	**10**	**0**	**0**	**0**	**16**	**0**	**0**	**0**	**0**	**4**	**32**
Task 5 – Permit Applications													
5.1 Lane County Facility Permit				3								1	4
5.2 USACE/DSL Wetlands Permit	2		3	6								1	12
5.3 UPRR Permit			2	3								2	7
5.4 Other Permits by Contractor													0
Task 5 Subtotal	**2**	**0**	**5**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**23**
Task 6 – Bid Documents and Bidding Assistance													
Bid Package and Contract Documents	2		6	14				24				8	54
Bidding Assistance	2		8	14				24				6	54
Task 6 Subtotal	**4**	**0**	**14**	**28**	**0**	**0**	**0**	**48**	**0**	**0**	**0**	**14**	**108**
Task 7 – Construction Administration													
Subtasks A through J			16	10		80			1250			24	1380
Subtask K - Construction Staking						8						2	10
Subtask L - Survey of Final Construction						5						1	6
Task 7 Subtotal	**0**	**0**	**16**	**10**	**0**	**93**	**0**	**0**	**1250**	**0**	**0**	**27**	**1396**
Task 8 – Post-Construction Services													
Subtasks A & B - As-Constructed Drawings				2		4			12	8	40		66
Subtasks C & D - Project Records and Documentation				2		4			12			6	24
Task 8 Subtotal	**0**	**0**	**0**	**4**	**0**	**8**	**0**	**0**	**24**	**8**	**40**	**6**	**90**
TOTAL - ALL TASKS	**35**	**24**	**212**	**308**	**12**	**112**	**259**	**460**	**1274**	**140**	**680**	**95**	**3611**

Personnel:

Labor will be invoiced by staff classification at the following hourly rates:

Senior Principal	$175.00
Principal	161.00
Principal Associate/Senior Associate	150.00
Principal Engineer/Associate	143.00
Senior Engineering Associate	137.00
Senior Engineer	131.00
Engineer VII	124.00
Engineer VI	117.00
Engineer V	110.00
Engineer IV	103.00
Engineer III	97.00
Engineer II	91.00
Engineer I	84.00
Senior Technician	103.00
Technician	85.00
Junior Technician	68.00
Administrator	74.00
Clerical	60.00

Project Expenses:

Expenses incurred in-house that are directly attributable to the project will be invoiced at actual cost. These expenses include the following:

Mileage	Current IRS Rate
Printing and Reproduction	At Cost
Postage and Delivery Services	At Cost

All computer/AutoCAD and other such equipment charges are included in the hourly rates of staff.

Outside Services:

Outside technical, professional and other services will be invoiced at actual cost plus 5 percent to cover administration and overhead.

MSA

SECTION 5

Project Approach and Understanding

The City of Springfield's Wastewater Master Plan, dated June 2008, identifies the Jasper Trunk Sewer as a means to serve undeveloped areas outside of the City limits and within the urban growth boundary (UGB) in the expansion area southeasterly of the City. The Request for Proposals (RFP) indicates that the Jasper Trunk Sewer will be approximately 20,000 feet long and range in size from 10 inches to 27 inches in diameter, with depths between 22 and eight (8) feet. It is understood that the implementation of this trunk sewer will allow for the abandonment of up to three existing sanitary sewer pump stations: Lucerne Meadows, Golden Terrace and Jasper Meadows. The City intends to implement the new trunk sewer in a timely manner to allow for additional development in the southeasterly area of the City as soon as is practical. It is the expressed interest of the City that this project help spawn development in the southeasterly expansion area.

The City has obtained funding for the project and desires to commence design services in the near term. The City is seeking a qualified professional civil engineering consultant to assist with planning and programming, preliminary and final designs and contract documents, bidding and award services, and construction phase engineering and inspection services for the project. Based upon our understanding of the project, the following is a discussion of key issues and our approach:

Pipeline Alignment/Routing Features/Challenge Areas

The proposed trunk sewer project is intended to serve the City's southeasterly expansion area within the UGB and allow for the abandonment of one to three existing pump stations. Existing topography generally limits favorable routing to a wide corridor along Jasper Road, with few exceptions. Various existing features along the corridor present certain routing challenges that warrant close study. Figure 1, which is presented at the end of this section, offers three alternative routing options: A, B and C.

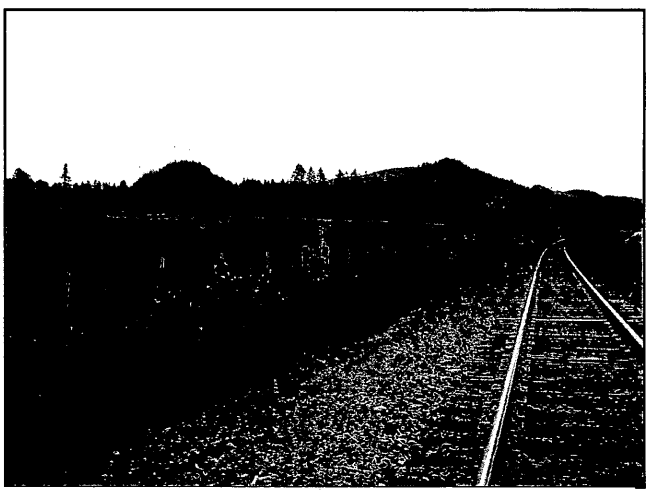
Beginning at the northerly end of the project, at the intersection of South 42nd Street and Jasper Road, extending to just easterly of South 47th Street, the Jasper Road right-of-way appears to be the most obvious route, without viable alternatives that warrant detailed study. As Jasper Road bends to the north, generally following the contours around a small hill, there appears to be at least two alternative routes. One route follows the road right-of-way, crosses the Union Pacific Railroad (UPRR), then routes southeasterly, parallel to the railroad (Figure 1, Alternatives A and C). This routing would involve certain challenges such as traffic control, tight corridor construction and possible solid rock excavation. The RFP identifies a cross-country option that extends from Jasper Road near South 47th Street, across farm and rural lands, to the intersection of Jasper Road and Mount Vernon Road (Figure 1, Alternative B). This option involves certain private property, wetland and grade/elevation concerns. It

Exposed solid rock easterly of South 47th Street

appears that this route would extend beyond the existing UGB limits, thereby potentially triggering the need for a County Land Use permitting process. Also, this route would likely require additional length of sewer main piping to connect the areas that lie within the UGB, directly to the north of the cross-country portion, to the trunk sewer.

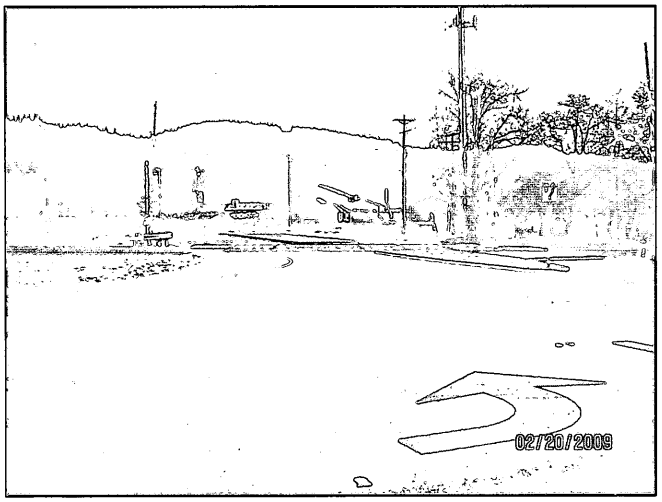
From the intersection of Mount Vernon Road and Jasper Road to approximately 4,000 feet southeasterly of that intersection it would appear that a key route to be considered is along the easterly edge of the UPRR right-of-way (Figure 1, Alternatives A and C), one that would require private property easements and possible wetlands permitting. There is a power substation along this portion of the route that is relatively close to the railroad right-of-way. However, it appears that there is sufficient space between the two to locate the trunk sewer through this area. Routing the pipeline within the Jasper Road right-of-way should also be carefully considered as well (Alternative B). That route includes potential impacts to the road, significant traffic control and the need for railroad crossings for future sewer main connections.

At approximately 4,000 feet southeasterly of the intersection of Jasper Road and Mount Vernon Road, there appears to be a wetland area of significant size (see Figure 1). In order to avoid this and other wetland areas, the trunk sewer could either be routed around the wetlands or a bored/jacked cased crossing could be constructed. Both options should be evaluated as part of this work. Between this particular, apparent wetland area and the Bob Straub Parkway, it seems that the most viable routes are easterly of the railroad right-of-way and within the Jasper Road right-of-way.

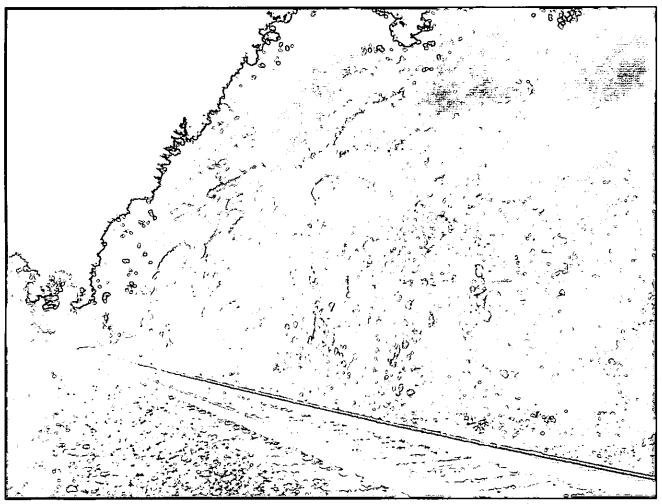


Potential routing option/easement area easterly of the UPRR

The newly constructed Bob Straub Parkway/Jasper Road intersection will need to be closely evaluated to determine the most favorable route through this area. Routing the trunk sewer within Jasper Road and continuing southeasterly in the road right-of-way is identified on Figure 1 as Alternative B. This route includes certain roadway, traffic and utility interests that will require evaluation. A crossing of the railroad would be required for any sewer main connections in this area. An alternative route includes a crossing of Bob Straub Parkway, then extending along the easterly side of the railroad right-of-way and southeasterly across



Bob Straub Parkway intersection with Jasper Road and the UPRR



Solid rock cut easterly and adjacent to the UPRR, south of Natron

undeveloped land (Figure 1, Alternative A). Wetland areas in this area should be avoided if possible. This route would then cross the railroad, joining the Alternative B route within Jasper Road, to avoid a solid rock ridge that rises roughly 50 feet adjacent to the railroad. Both Alternatives A and B would then terminate in the vicinity of a small road undercrossing of the railroad, approximately 1,500 feet north of the UGB limits.

A third alternative route involves crossing the Bob Straub Parkway and routing along Brand S Road to a location that is near two existing mill ponds, easterly of the existing mill. That route would then extend to the top of the ridge to the south, with a sewer invert at roughly 580 feet in elevation. This alternative, while avoiding expensive solid rock excavation along the Jasper Road corridor south of Bob Straub Parkway, would leave approximately 30 acres within the UGB unserved by gravity. A pump station could then be implemented to serve those 30 acres. It is understood that this option contradicts the City's stated goal to serve the entire southeasterly UGB area by gravity, and would not be considered for recommendation unless costs of other alternatives were clearly higher than both the capital and long-term operation and maintenance (O&M) costs of the required pump station.

Geotechnical Conditions

Geotechnical investigations will need to be conducted to identify groundwater levels, solid rock profiles, sheeting/shoring/trenching conditions, constructability and the potential for soil liquefaction. Preliminary on-site review has revealed certain areas of shallow and exposed solid rock along the route. Existing topography, apparent wetland areas and our team's (including OBEC's) existing experience suggest the potential for high groundwater levels along the route. Borings should be conducted at regular intervals along the route and wherever bored/jacked cased crossings are made.

Profiles/Sewer Depth

The existing grade from the upstream end of the project to the connection point at South 42nd Street appears to be adequate to serve the area by gravity trunk sewer. Where there are certainly variations in the grade, it does not seem to be the case that any pumping facilities would be required by this project; however, there are some areas that will need to be closely evaluated prior to final route selection. Several drainage channels/ditches are currently routed through culverts under both the UPRR and Jasper Road. While these drainages do not look to be deep enough to conflict with the gravity sewer, it will be important to confirm cover over the pipeline at these crossings. A second area that will need to be closely reviewed with respect to grade is the cross-country portion of Alternative B (see Figure 1). This route extends across rural undeveloped lands and appears to include significant lowland areas. Spot elevations should be taken at a number of locations along this prospective route as part of preliminary design. It appears that the receiving sewer at South 42nd Street is roughly 20 feet deep, allowing greater design flexibility than would a shallower receiving sewer.

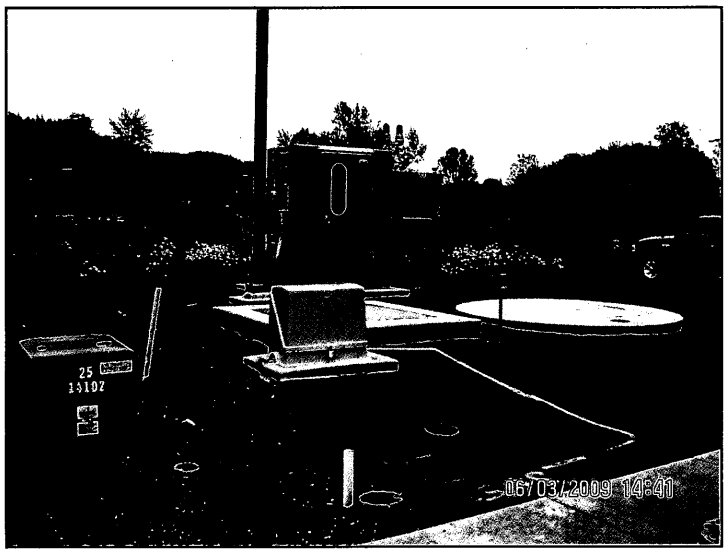
Modeling/Loading Calculations

It is understood that the City's recently completed Wastewater Master Plan did not include all anticipated flows for the southeast expansion area as part of the modeling for the Jasper Trunk Sewer. The master plan suggests that modeling conducted as part of this project should include a total of 3,765 Equivalent Dwelling Units (EDUs) for the Jasper Trunk Sewer loading analysis. It is crucial that the loading analysis confirms locations of anticipated sewer main connections and their respective loading contributions so that trunk sewer sizes and grades may be properly designed.

Low Sewage Flows in Early Years of Operation

The new Jasper Trunk Sewer will be designed and constructed for ultimate service area flows, assuming full build-out at planned land use conditions. Because of existing terrain, sewers will likely be designed at or close to minimum allowable slopes and velocities at design flows. In the early years of operation, low flow conditions can cause problems with hydrogen sulfide (H_2S) generation resulting from solids build-up. Hydrogen sulfide gas creates noxious odors and can combine with moisture in the sewer environment to form highly corrosive sulfuric acid. This condition can be highly damaging to concrete pipes and manholes. MSA is experienced with design techniques and features to minimize the potential for H_2S generation and to mitigate problems with corrosion potential when H_2S generation conditions cannot be avoided. Mitigation measures can include: the specification and design of non-corrosive pipe and manhole materials; special geometric designs to control the release of H_2S gas; chemical feed systems for H_2S control; and special features to assist with regular flushing of the trunk sewer.

Pump Station Abandonment/Sewer Main Connections/Locations



Existing Jasper Meadows Pump Station

One key goal of the Jasper Trunk Sewer project is to abandon one to three existing pump stations. Preliminary site reconnaissance suggests that all three pump stations (Lucerne Meadows, Golden Terrace and Jasper Meadows) could likely be abandoned as part of this project. Detailed analysis will confirm this assumption. While the trunk sewer connection at Lucerne Meadows is relatively straightforward, the trunk connection for the other two pump stations is somewhat less obvious. A gravity main will need to be routed through undeveloped lands between the Jasper Meadows Pump Station and the Jasper Trunk Sewer. Flows from the Golden Terrace Pump Station tributary area could be routed through an existing 12-inch gravity main directly to the site of the Jasper Meadows Pump Station and then the combined flows of both pump stations could then be routed through a currently undeveloped area to the trunk sewer. The proposed engineering budget includes design of approximately 1,300 feet of gravity sewer main from the Jasper Meadows Pump Station to the Jasper Trunk Sewer.

Permitting

Apparent wetland area adjacent to and easterly of the UPRR right-of-way

MSA is highly experienced with all aspects of permitting associated with public works projects. We have successfully processed many of the types of permits required by this project. MSA's recent and successful pipeline improvements permitting work provides us with the important practical experience that is essential to getting the project through the regulatory process effectively and efficiently. Both MSA and our teaming partner OBEC have a keen understanding of the permitting requirements demanded by the Corps of Engineers, the Oregon Division of State Lands, Lane County and UPRR.

Easement Acquisitions

MSA has served as program manager for many large infrastructure projects. We have managed many successful easement acquisition programs that have been fully coordinated with our other preliminary engineering, final design and construction administration activities. We routinely operate as "owner's agent" throughout the easement acquisition process, working closely with our partner Universal Field Services, Inc. (UFS) to ensure that acquisitions proceed as smoothly as possible.

Public Involvement

The MSA team offers extensive experience with public involvement programs of all types. We have facilitated numerous low-key, "open house" informational-style public information forums. We have developed exhibits and slide shows and have led numerous workshop presentations for public officials where the general public is invited to participate. We have presented many projects as part of formal public hearing processes. The form that a particular public involvement program may take for a given assignment is often guided by the style of the managing public agency. MSA often advises on public involvement interests and assists our clients in carrying out the type of public information programming that is judged to best fit a project's needs.

Traffic Control

Traffic flow disruptions are anticipated during trunk sewer construction activities and will be managed through incorporation of appropriate construction contract provisions developed through coordination with the County and the City. The provisions will require the construction contractor to provide full traffic control in accordance with prescribed performance demands. These provisions will require detailed traffic control programming to be developed by the construction contractor, consistent with local work hour and work condition requirements in order to minimize overall project impact on the local community. Such traffic control requirements are routinely addressed in MSA design and construction management projects.

Jasper Road/South 42nd Street intersection

Schedule

Per the RFP, the City desires to have bid documents completed by April 23, 2010. This schedule will allow for much of the construction work to be completed during the 2010 construction season, with final completion occurring early in 2011. While the proposed schedule does not appear to be fast-track, MSA is very familiar and has extensive experience with what it takes to complete projects of this nature. MSA completed designs on schedule and on budget for the current City of Springfield, Sanitary Sewer Rehabilitation – 2009, Contracts A and B work. MSA will complete the Jasper Trunk Sewer design within the City's desired schedule.

It is proposed that the construction period be established for project completion within a total of seven (7) months. Assuming the trunk sewer could be constructed at an average rate of 150 feet per day, the trunk could be completed within approximately 5 ½ months with one construction crew. Assuming the roughly 1,300 feet of sewer main to the Jasper Meadows Pump Station could be constructed at a rate of 200 feet per day, this work would require approximately one (1) week. Assuming the transfer (cut over) to gravity flow and decommissioning of the three pump stations would add another month, the total construction period would be approximately seven (7) months. This schedule could be accelerated if a contractor were to assign more than one pipe-laying crew to the project.

Scope of Work

The following is the proposed scope of the engineering services to be provided to the City by MSA. In order to provide a fee estimate for this scope of work, clarifications are included establishing the assumed level of effort, the design, bidding and award and construction schedule, work products, and other factors that may affect the fee budget.

Task 1 – Overall Project Management and Predesign

Work under this task includes project management and coordination, investigations, information compilation and review, geotechnical explorations, identification and analysis of various trunk sewer routing alternatives, identification of required permits, identification of easement needs, and preliminary project cost estimating. Results and recommendations, with input from City staff, will be presented in a "Sewer Route Selection Report". Work will include formal presentation of the report to City Council.

Work under this task also includes in-house review and task coordination, quality control, coordination with subconsultants and City staff, tracking of project costs, updating project schedules, and preparation for and attendance at various project-related meetings.

Anticipated subtasks are detailed as follows:

Task 1.1 Project Management and Coordination

MSA will effectively manage all elements of the project from project start-up to construction completion. Detailed work programming (scope, planning and design criteria, schedules, costs, etc.) will be developed and coordinated with the City's project manager. All subconsultant work will be coordinated and managed through MSA's project manager, Kyle McTeague, P.E. As principal-in-charge, MSA's founding principal, Phil Smith, P.E., will personally conduct our firm's internal QA/QC reviews to ensure that all work products and communications meet or exceed the high level of performance demanded by our firm and expected by the City. MSA will actively manage all project work within agreed budgets, completing work within agreed time frames.

Task 1.2 Investigations and Information Compilation and Review

Under this task, existing information regarding the project will be collected as available. This information will include anticipated flows, the existing collection system model, existing available underground utility mapping, base mapping, topographic data, property and tax lot maps, as-constructed drawings from the City of Springfield and others, available subsurface soil condition information, available plans for improvements in the existing right-of-way by utilities or others, and other information relevant to the project.

Task 1.3 Geotechnical Explorations

The geotechnical exploration work will be completed in two phases. The initial phase will include site reconnaissance and review of available information for up to three (3) potential trunk sewer routes. The second phase will include field exploration and a more detailed geotechnical investigation focusing on the selected alignment. These services will be provided through MSA's geotechnical engineering subconsultant, Foundation Engineering, Inc. (FEI). A scope for each phase of work is described below.

A. Phase 1 Reconnaissance

Available information, including geologic maps and reports, water well logs, and any other subsurface information, will be obtained and reviewed. A detailed reconnaissance of each alignment will be completed, including observation of surface features, exposed rock, site topography, evidence of slope instability and evaluation of the existing road embankment along Jasper Road and the railroad. Pertinent data will be summarized in a preliminary technical memorandum that will address:

- Anticipated subsurface features (soil, rock and ground water)
- Potentially adverse site or subsurface conditions (rock outcrops, slope instability, embankment fill settlement, difficult access, etc.)
- Comparison of construction issues along alternate routes

The logs of over a dozen water wells drilled in the vicinity of Jasper Road were reviewed. Those logs indicate widely varying soil/bedrock profiles. The wells north of Jasper Road indicate the presence of nine (9) to 26 feet of, predominantly, clay over bedrock (described as sandstone, claystone and tuff). Wells located on or south of Jasper Road indicate ±20 feet to >50 feet of, predominantly, clay and gravels with cobbles followed by sandstone, conglomerate or claystone. Groundwater depths varied significantly (from ±12 feet to over 50 feet).

B. Phase 2 Geotechnical Investigation

A more detailed geotechnical investigation will be completed once a preferred alignment has been selected. The scope of the Phase 2 investigation will include:

- Detailed site reconnaissance of the selected route
- Field exploration and sampling
- Laboratory testing
- Engineering analysis
- Report preparation

A detailed reconnaissance of the selected route will be conducted, focusing on site and topographic features that may impact specific sections of the trunk sewer (rock excavation, cobbles and boulders, shallow ground water, etc.).

Up to 13 exploratory boreholes with a maximum borehole footage of 325 feet will be drilled. A borehole will be drilled approximately every ±2,000 feet on the trunk sewer (10 boreholes). In addition, one borehole will be drilled at each of two assumed bored and jacked crossings of the railroad and one borehole will be drilled along the alignment of the connecting lateral that allows for abandonment of the Golden Terrace and Jasper Meadows Pump Stations.

Based upon the estimated depths of the new sewers, an average borehole depth of 25 feet is assumed for estimating purposes. Individual borings will vary according to anticipated trunk sewer depths, but typically would extend at least 10 feet below the bottom of the trench. SPT and Shelby tube samples will be obtained at 2 ½-foot intervals to the anticipated bottom of the trench and at ±5-foot intervals thereafter.

Standpipe piezometers will be installed at a minimum of two locations to monitor groundwater levels. Groundwater levels will be measured twice to establish seasonal fluctuations.

Laboratory testing will be limited to index tests such as water content, Atterberg limits and gradation to characterize the soils that are to be trenched. Field vane shear tests will be run on relatively undisturbed Shelby tube samples to evaluate the shear strength of fine-grained soils in the trench sidewalls.

Engineering analysis of the selected alignment will likely include stability analysis for trench sidewalls and localized stability of existing slopes and/or road embankments. The potential risk of liquefaction of saturated sands if encountered along the selected alignment will also be evaluated.

The results of the Phase 2 investigation will be summarized in a final engineering report. The report will address the following:

- Potential adverse site and topographic features
- Potential seismic hazards (liquefaction and slope instability)
- Anticipated soil and rock conditions along the alignment
- Groundwater levels, seasonal fluctuations and anticipated trench dewatering
- Trench wall stability and anticipated bottom stabilization
- Lateral earth pressures for shoring design by the contractor

The report will be prepared and stamped by a geotechnical engineer licensed in the state of Oregon. Five copies of the report will be provided to the City.

Task 1.4 Identification and Analysis of Various Trunk Sewer Routing Alternatives

Under this task, a minimum of three feasible pipeline routing alternatives will be identified and assessed and a preferred alignment will be recommended. Our project management team has toured the prospective trunk sewer pipeline corridor and various alignment opportunities have been reviewed. Figure 1 illustrates the general pipeline corridor from Jasper Road and 42nd Street to the southerly limit of the UGB. This figure illustrates three potential pipeline alignment alternatives that appear to be feasible. While there are undoubtedly other variations on the alignment options shown, it is anticipated that the final alignment will closely follow some combination of the illustrated preliminary alignment alternatives.

The alternatives analyses in this task will consider the preliminary route suggested in the RFP that primarily follows Jasper Road and includes a cross-country "short cut" near the northerly end of the project (Figure 1, Alternative B). The cross-country portion of that route extends from Jasper Road near South 47th Street, across farm and rural lands, to the intersection of Jasper Road and Mount Vernon Road. The alternatives analysis will also evaluate the merits of a second route that generally follows the Jasper Road/railroad alignment (Figure 1, Alternative A), as well as a third route that primarily follows the path of the second alternative but also includes portions of the route that circumvent certain apparent wetland areas (Figure 1, Alternative C). Within the Jasper Road/railroad alignment, there are many specific sewer location alternatives which will be identified and analyzed.

As part of this project, one to three pump stations will be abandoned. Based on our preliminary review of the project it appears that all three pump stations (Lucerne Meadows, Golden Terrace and Jasper Meadows) could likely be abandoned as part of this project. A trunk sewer connection at the location of Lucerne Meadows will be relatively straightforward due to the proximity of the trunk sewer. Trunk sewer connections, as part of abandoning the

Golden Terrace Pump Station and the Jasper Meadows Pump Station, will require roughly 1,300 feet of gravity sewer line. Preliminary reviews indicate that it is likely possible to route gravity flows from the Golden Terrace Pump Station through existing sewer mains to the location of the Jasper Meadows Pump Station. Combined flows from both areas served by these pump stations could then be routed by gravity to the Jasper Road Trunk Sewer through a new main constructed as part of this project. Trunk sewer routing analyses will include route evaluation for this sewer main.

Preliminary alternatives will be selected that take advantage of existing roadway and railroad rights-of-way or closely parallel alignments along such rights-of-way. Guidance provided in the American Society of Civil Engineers' "Manual of Practice – No. 46, Pipeline Route Selection Manual for Rural and Cross-Country Pipelines" will be referenced and applied to this project's routing analysis work as may be appropriate. Work activities anticipated under this task include the following:

A. *Preliminary General Corridor Review* -- Conduct a general review of the project corridor, incorporating City input and other relevant information that may have a bearing on the project.

B. *Preliminary Field Reconnaissance* -- Conduct preliminary field reconnaissance, updating and expanding upon field reconnaissance completed to date and incorporating further City input and other relevant information which may have a bearing on the project.

C. *Preliminary Map Studies* -- Conduct preliminary map studies of the project corridor, noting all items of potential interest relative to prospective pipeline alignment. Review and study will include the following available mapping sources: City sewer, wetlands, zoning, topographic mapping, wastewater master plan maps, USGS topographic maps, aerial photography, National Wetlands Inventory mapping, DOGAMI geological maps, Oregon Department of Transportation (ODOT) and Lane County highway/roadway right-of-way maps, Lane County soil survey maps, City land use and zoning maps, FEMA flood plain maps, tax assessors maps (Lane County) and utility maps (electrical power, natural gas, telephone, fiber optics, T.V. cable, sewer, irrigation, municipal water). Develop composite utility mapping along prospective pipeline routes to assist with localized routing recommendations. The presence of existing utilities will have a bearing on trunk sewer alignment options.

D. *Lateral Connection Overview* -- Conduct a preliminary review of potential lateral connections with City staff. Final designs will include manholes and lateral "stub outs" where future connections are anticipated. Lateral connections and routing will be identified that best facilitate abandonment of the existing pump stations.

E. *Collection System Modeling/Loading Analysis* -- The City's Wastewater Master Plan, dated June 2008, will be reviewed with respect to flows and demand for the Jasper Trunk Sewer. The existing wastewater collection system model will be updated to

include unaccounted-for EDU system demands. The Wastewater Master Plan suggests that updated modeling should include an additional 318 EDUs for a total of 3,765 EDUs. All future loading that can be expected for all property within the UGB that is to be served by the Jasper Trunk Sewer will be included in the updated modeling analysis. The focus of this task will be to determine ultimate peak sewage flows to guide pipe sizing and grades for the full length of the Jasper Trunk Sewer.

G. *Creek/Drainage Ditch Crossing Concepts Assessment* -- Various creek and drainage ditch crossing concepts will be reviewed and assessed as they relate to pipeline routing decisions. Surface crossing methods will be reviewed along with the bored/jacked/cased option and the overhead pipe-bridge option. Understanding the realistic choices for such crossings may have a bearing on routing decisions.

H. *Solid Rock Excavation/Routing Impacts* -- At least two key areas along the routing corridor appear to have potential for solid rock excavation, depending upon final route selection. Near the upstream end of the project, south of the Natron area, the topography of certain portions of developable land within the UGB forms a gentle ridge that terminates in an exposed rock face, roughly 50 feet high, at the edge of the UPRR right-of-way. It appears that routing the trunk sewer within the Jasper Road right-of-way in the vicinity of this rock cut would require solid rock excavation. Near the northerly end of the project between South 47th Street and Mount Vernon Road there is evidence of shallow subsurface rock within the Jasper Road right-of-way. If the selected route follows the right-of-way in this area then solid rock excavation is likely required here as well.

I. *Upstream End Concepts/Review* -- Develop and review concepts for serving the upstream (southeasterly) portion of the service area as necessary to establish basic localized pipeline routing decisions. Existing topography and subsurface solid rock impact the options for serving this area. It is understood that the City desires to serve the entire southeasterly UGB area by gravity. While this appears feasible, serving a certain small area at the upstream end of the project by gravity may come at significantly higher cost and thus may warrant discussions/investigations regarding a pumping option for this small area. Proposed engineering budgets included herein assume a gravity trunk sewer only.

J. *Utility, Railroad and Roadway Agency Consultations* -- Consult with potentially impacted utility, railroad and roadway interests to review proposed pipeline routing concepts and identify items of interest and/or concern. Investigate any mutually beneficial opportunities and identify any special project coordination needs.

K. *Analysis of Challenge Areas/Corridor Reaches* -- In developing our proposal, MSA has broken the project corridor into several distinct areas and reaches, each of which present special circumstances that must be considered in selecting a final pipeline route. Under this task, each area or reach will be reviewed, assessed and analyzed in

terms of the various pipeline routing considerations. Challenge areas and corridor reaches and options are listed as follows:

- South 42nd Street to Mt. Vernon Road
  - Jasper Road/Union Pacific Railroad Alignment
  - Cross-country Alternative
- Mt. Vernon Road to Bob Straub Parkway
  - Jasper Road/Union Pacific Railroad Alignment
  - Jasper Road/Union Pacific Railroad with Wetland Circumventing
- Bob Straub Parkway Interchange
  - Jasper Road/Union Pacific Railroad Alignment
  - Jasper Road/Union Pacific Railroad with Circumventing of Wetlands
- Bob Straub Parkway Interchange to UGB
  - Jasper Road/Union Pacific Railroad Alignment
  - Natron Cross-country Alternative

Each of the above alignment options and variations will be reviewed with respect to a variety of evaluation parameters, including: environmental impacts; permitting interests; existing road and railroad right-of-way interests; private property easement/right-of-way acquisition interests; local community interests; existing utility interests; roadway impacts; traffic impacts; business/agricultural/operational impacts; system maintenance and access interests; cost and risk; and other potential special interests. The connecting piping to the sewage pump stations to be abandoned will also be evaluated under these same criteria.

L. *Staff and Legal Reviews* -- Review various findings with City staff, and, as may be appropriate, on matters of particular strategic or sensitive interest.

M. *Identification of Preferred Alignment* -- Under this task, the preferred trunk sewer alignment will, in consultations with the City, be selected and described. Overall routing evaluations will be considered in compiling a composite routing alignment that appears to best balance the various pipeline performance requirements and other project routing interests. Appropriate documentation will be provided to support the permitting, right-of-way acquisition and design work. In presenting the preferred alternatives, we will be diligent in presenting the appropriate "next best" option for a given alignment element; should a particular interest (environmental, property acquisition, permitting, public sentiment, etc.) stall subsequent processes, decisions can be logically and methodically made to keep the program moving to the successful completion of right-of-way acquisition and required permitting and agency approvals. The preferred alignments for the sewers extending to the existing pump stations will also be identified in consultations with the City.

Task 1.5 Identification of Required Permits and Agency Consultations

Under this task, various permitting requirements and special regulatory approvals will be inventoried and summarized in preparation for Task 3 – Design work. Preliminary informal consultations will be conducted with appropriate agency representatives. Anticipated sub-tasks are outlined as follows:

A. *Agency/Permit/Approval Inventory* -- A preliminary list of interested agencies and potential project permits is summarized below:

Interested Agencies	Permits
Lane County Department of Public Works	Facility Permit
U.S. Army Corps of Engineers	Joint "Section 404" Removal/Fill Permit
Oregon Department of State Lands	Joint "Section 404" Removal/Fill Permit
Union Pacific Railroad	Railroad Crossing Permits
Oregon Department of Environmental Quality (DEQ)	Current 1200-CA Permit

B. *Preliminary Agency Consultations* -- Our project team has completed several recent successful permitting efforts involving most of the above agencies. We enjoy broad agency respect and hold a solid reputation for presenting logical, defensible, supportable and documented permit applications. Under this task, appropriate permitting agency representatives will be contacted to confirm jurisdiction authority, agency interest, permit requirements and anticipated agency roles.

Task 1.6 Identification of Easement Needs

Prepare an inventory of properties and identified easement requirements for the various routing alternatives. Identify known "friendly" and/or "adversarial" interests that may have a bearing on routing preferences. City staff is anticipated to be of help in this regard, as is our team partner, UFS.

Task 1.7 Preliminary Project Cost Estimating

Prepare a comparative cost analysis of the various routing alternatives to assist in the selection of the preferred trunk sewer routing alternative. A detailed planning level cost estimate analysis will then be developed for the preferred alternative. This analysis will include all elements of the proposed new trunk sewer, including provisions for project management, engineering, construction, permitting, and right-of-way and land acquisition costs. Engineering cost estimates will reflect contracted amounts.

Task 1.8 Sewer Route Selection Report

Develop a "Sewer Route Selection Report" that summarizes findings developed in the above tasks. A draft report will be provided to the City for review and comments. A final report will be prepared incorporating City comments and five (5) copies will be provided to the City. MSA will present and/or assist the City Engineer with a project presentation to the City Council. Graphics and presentation materials will be prepared by MSA to support that presentation.

Task 2 – Field Data Collection and Presentation

Under this task, topographic surveying will be performed as necessary to support the proposed Jasper Road Trunk Sewer project. Anticipated work includes:

Task 2.1 Field Surveying

Conduct field surveys within the public rights-of-way, along the railroad right-of-way and through anticipated easement areas along the selected route for the trunk sewer and the connecting piping to the three pump stations, identifying right-of-way, railroad, easement and roadway limits. Research, uncover and tie sufficient survey monuments to resolve the rights-of-way locations. Coordinate with the City and incorporate existing survey information as may be available from the City, or Lane County. Complete surveys at sufficient detail to prepare necessary easement mapping for the project. For the purposes of fee estimating, it is assumed that there will be sufficient found survey monuments for the purposes of the project and that no boundary survey work will be required. If boundary survey work is required, it will be provided as optional additional services.

Task 2.2 Horizontal and Vertical Control

Establish and document horizontal and vertical control as required, based on City-approved data. Include base benchmark data on design drawings.

Task 2.3 Bench Marking

Place temporary bench marks approximately every 500 feet along the project route to facilitate construction staking.

Task 2.4 Utilities Surveying

Survey all existing underground utilities as located by the utility owners, existing overhead utilities and other above-ground structures. Include all rim and invert elevations of storm, sanitary and other subsurface structures.

Task 2.5 Utilities Pipeline Data Collection

Identify location, size, depth and operating pressures, if known, of all water, gas, steam and other pressure pipelines.

Task 2.6 Topography Identification

Identify surface elevations every 50 feet along the alignment and at all grade breaks to the nearest 0.1 foot. Locate and identify all critical ground topography and other geographic features that may have a bearing on the pipeline alignment and design.

Task 2.7 Tree Identification

Locate and identify by common name all trees two (2) inches and larger or with a canopy within 30 feet of the alignment.

Task 2.8 Ties

Provide horizontal and vertical ties to all relevant physical features within 15 feet of easement and right-of-way areas, including manmade structures such as buildings, signs, bridges, culverts, guardrails, sheds, landscaped areas, etc.

Task 2.9 Utilize Existing Data

Utilize City-provided 2000 digitized aerial maps and as-built drawings and comply with the City Engineering Design Standards and Procedures Manual.

Task 2.10 AutoCAD Drawings

Prepare drawings in the City's required version of AutoCAD software at a scale of 1 inch = 20 feet.

Task 2.11 Final Design Plans

Provide electronic, signed and sealed vellums and paper copies of the final design plans to the City.

Task 3 – Design

Under this task, the final design of the project will be accomplished. The detailed subtasks are as follows:

Task 3.1 Preliminary City Approvals

Obtain City approvals of preliminary pipeline route, sizing, grades, sewer hookup locations, cost estimate and permitting requirements, including those required by UPRR, Lane County, Corps of Engineers, Department of State Lands and others.

Task 3.2 Construction Drawings and Bid Package

Prepare construction drawings and a bid package. The bid package will have all information and materials required for a complete set of contract documents, including invitation to bid, instructions to bidders, bid proposal, bonds, certificates of compliance, contract, general conditions, special provisions, special technical specifications, standard drawings and specifications as required, permits and approvals, easements and easement conditions, and final design drawings. Plan and profile drawings will be developed at a horizontal scale of 1 inch = 20 feet and vertical scale of 1 inch = 5 feet. MSA's engineering will comply with the City of Springfield's adopted Engineering Design Standards and Procedures Manual, as modified to suit the particular elements of this project. Drawings will be produced in the City's desired version of AutoCAD. During the design phase, easement appraisals and acquisitions (Task 4) and permit applications (Task 5) will commence. In addition to the designs for the trunk sewer and the lateral sewers to the sewage pump stations, the bid package will include provisions for abandoning the pump stations: removing all of the electrical and mechanical equipment, abandoning and filling of wetwells or modifications to the wetwells, and site restoration.

Task 3.3 30%, 60% and 90% Reviews

Prepare the bid package and submit to the City for review at the 30%, 60% and 90% complete levels. An updated construction cost estimate will be provided with each design submittal. MSA will coordinate and conduct design review meetings at the 30%, 60% and 90% complete levels. Agendas and meeting minutes will be prepared by MSA and distributed to all attendees.

Task 3.4 100% Completion

Complete contract documents to the 100% level in accordance with direction received from City staff and property owners, as required by permit conditions. A final cost estimate will be prepared for the construction contract.

Task 3.5 Public Information Process

MSA will participate in a public information process relating to the Jasper Trunk Sewer. Preliminary plan views of the route will be provided and, if so requested by the owner, the route will be staked (field located) so that property owners may see the proposed route on-site. MSA project engineering staff will attend two public meetings as part of the public information program for the trunk sewer project.

Task 3.6 Easement Coordination

MSA will participate in several meetings with private property owners to coordinate individual easements.

Task 3.7 Furnish Records for the City

Upon request, provide to the City all records pertaining to the project, including reproducible drawings, electronic copies of drawings, and other documents associated with the project.

Task 4 – Easement and Right-of-Way Acquisition

To support the easement acquisitions required for the project, our team includes the real estate specialist firm UFS. The fee estimate assumes 14 easements will be required for the project. The proposed services for acquisition of easements for the project are outlined as follows:

4.1 Legal Descriptions and Easement Maps

Order and review preliminary title reports. Prepare individual property easement maps and legal descriptions on City supplied standard easement forms. Easements will typically include a temporary construction easement that will expire upon completion of construction. Both temporary and permanent easements will be clearly shown on the final design drawings of the project.

4.2 Acquisition of Easements

A. *Property Appraisals* -- UFS will be using Duncan and Brown Appraisal Services of Eugene for the appraisals for the project. Duncan and Brown is on the City's approved property appraisal list. The appraisers will develop value appraisals of easements based on industry standard methodologies and in accordance with applicable regulations. Appraisal reviews are not required but can be completed as optional work if the City chooses to have a formal review. UFS's project manager will check each appraisal for completeness prior to sending to the City for authorization.

B. *Offer Presentation* -- With prior approval from the City, prepare individual property owner offer presentation packages and conduct personal offer presentations. Report and coordinate with the City. Offers will be prepared following Oregon State law requirements. UFS will work with each property owner to reach a satisfactory agreement to both the owner and the City. Administrative settlements above the approved amount will need to be authorized by the City. UFS will make recommendations and prepare justification letters as needed.

C. *Legal Reviews/Title Searches/Final Closing Coordination* -- Coordinate the final closing, final reviews and details with the title company and City legal counsel, if necessary. Review updated title reports and set up closing at the title company. Prepare all earnest money agreements and sales agreement documents for property owner, obtain City signatures and process all record filings with the Lane County Recorder's office and pay all associated filing fees. Provide the City with a file of all executed documents for each easement. The fee estimate for the project anticipates an uncontested process for all of the easements. Optional additional engineering and property acquisition services will be provided to the City as needed to support any contested acquisitions.

Task 5 – Permit Applications

Under this task, various permit applications will be prepared and filed. Anticipated permits are listed in Task 1.5 above. A discussion of respective permitting work and strategies is provided below. As part of this proposal process we have confirmed that both Jasper Road and the Bob Straub Parkway are under the jurisdiction of Lane County. Thus, it is anticipated that an ODOT permit would not be required for this project. It is assumed that the City will pay all required permit fees. Fee estimates include provisions for the following permits and regulatory approvals under the following assumptions:

5.1 Lane County Department of Public Works, Application for Facility Permit

Jasper Road has recently been transferred from ODOT to Lane County. The impact upon the County's facilities consists of possible pipeline routing along the Jasper Road shoulder or in the roadway itself. Also, one or two bored and jacked crossings of the adjacent railroad would likely impact Jasper Road. Work sub-elements will include the following:

A. *Interim Predesign Drawing Review* -- Meet with County permitting staff to review preliminary engineering drawings and incorporate input if needed.

B. *Application Preparation and Submittal* -- Complete the required permit application and submit for County approval. Fee estimates assume a single permit application. It is understood that no application fees are required.

5.2 U.S. Army Corps of Engineers (Corps) "Section 404"/Oregon Department of State Lands (DSL)Removal/Fill Permit

This work program assumes that either wetlands will be avoided or that the permitting process will be relatively straightforward. Wetlands may be avoided either by routing around them or by means of bored/jacked/cased crossings beneath them. For the case of routing beneath wetlands, application for permits would still be required; however, in this case regulatory agencies typically determine that formal permits are not required, or that construction provisions are nominal. Based on our preliminary site reconnaissance, it is anticipated that we would recommend open cut trenching only through low quality wetlands.

In such cases, applications to the Corps would request the simplified "Nationwide" permit status, and applications to DSL would likely yield typical provisions associated with "no permanent impact" status, such as replacement of top soil, erosion control, installation of trench plugs and replanting.

As part of the application process, wetland delineation and preliminary agency consultations associated with permitting will commence as early as possible in the design phase to minimize the impacts of the Corps/DSL permitting process to the overall project schedule. The Corps/DSL permit applications will be filed based on an approximate 30 to 50 percent complete design. Corps/DSL conditions will be incorporated into the final designs and construction contract documents. Anticipated work elements are summarized as follows:

A. *Informal Agency Consultations* -- Contact Corps and DSL permit review staff and meet to informally review the proposed project and the prospective permit application. Review the project purpose and need and discuss the applicant's logic for the proposed routing. Confirm regulatory interpretations, documentation requirements and review procedures.

B. *Wetland Delineation* -- Wetland areas and waters will need to be delineated as part of the permit process and to facilitate designs to avoid them. Trunk sewer routing that avoids impacts to wetlands will be proposed. It is expected that a biological assessment would not be required for sewer trunk routing that avoids wetlands and waters impacts. A wetland/waters delineation report will be prepared and submitted as part of the Joint Corps/DSL permit application.

C. *Draft Permit Application Package and Staff Review* -- Complete the required permit application, including all required supporting appendices for review with City staff. It is assumed that the project will have no effect to botanical, wildlife and fish resources and that no rare plant study will be required. It is assumed that no Willamette Greenway Permit will be required.

D. *Finalize and Submit Application* -- Incorporate various comments and prepare final application packages for agency signatures. Coordinate delivery and submittal of application packages. Fee estimates assume the City will remit application processing fees directly to the Corps and DSL.

E. *Appeal Assistance (OPTIONAL WORK)* -- The fee estimate assumes an uncontested process. Assist with potential appeal processes beyond the scope of this work.

5.3 Union Pacific Railroad (UPRR) Permit

A permit will be required from the Union Pacific Railroad for each crossing of the railroad right of way. Provisions of the UPRR permit will be included in the contract documents as required. It is assumed that up to three railroad permits will be required for this project. The proposed engineering budget assumes that UPRR permit and review fees will be paid

directly by the City. An ODOT Rail Crossing Order Application is not anticipated to be needed for this work. If it becomes necessary to alter an existing crossing, an ODOT Crossing Order will be required. It is also anticipated that no appraisals or easement descriptions will be needed for this project. The proposed budget assumes that the project will be designed to meet Railroad requirements for utility crossings and encroachments.

5.4 Other Permits by Contractor

Construction contract documents will incorporate special provisions for all other required permits to be acquired by the construction contractor as part of construction work. It should be noted that the City maintains a 1200-CA permit with DEQ for erosion and sediment control associated with sanitary sewer work. The construction contractor will be required to comply with all provisions of the 1200-CA permit, including preparation and submittal of an Erosion and Sediment Control Plan associated with this particular project.

Task 6 – Bid Documents and Bidding Assistance

MSA will prepare a bid package and contractual documents suitable for bidding (including, but not limited to, drawings, special provisions and bid proposals) of the project. MSA will submit to the City reproducible vellum construction plans and the master copy of the project bid books. All of the above shall be in accordance with applicable State laws, City codes and the City of Springfield Standard Construction Specifications, 1994 Edition, as modified by contractual special conditions. The specifications will include provisions that require the contractors to have a Spill Prevention and Control and Countermeasure Plan in place and to comply in all respects to the requirements of DEQ and EPA with respect to spills of all types.

MSA will assist in the bid process and provide engineering services for the bid package. The bid documents shall be prepared in the City's bidding format. The City will supply the standard bid document forms. MSA will complete and submit to the City 30 sets of plans and specifications and an electronic file of the bid package will also be provided in PDF format. MSA will send letters notifying utility companies and affected parties of the pre-bid meeting and attend and record the pre-bid meeting. MSA will be available to answer project questions presented by bidders during the bidding for the project. The City will advertise for bids in the Register Guard and the Portland DJC, hold a bid opening, check bids and bid bonds, award and process the contract, and send the Notice to Proceed to the contractor.

Task 7 – Construction Administration

MSA will administer the construction phase of the project to assure that the construction contractor provides for successful construction and completion of the project. MSA will provide one full-time on-site construction inspector for a seven-month total construction period. MSA will provide general engineering review of the work to assure conformance with the design. MSA will perform construction staking, inspections during construction of the project, measurements for payment of pay quantities, survey of final construction, preparation of as-built drawings, and attest to the final constructed project. The fee estimate

for services under this task are based upon the construction schedule, as presented below. The engineering services work by MSA during construction will include:

A. Coordinating with property owners, contractors, subcontractors, utility companies, LTD, School District, USPS, UPRR, Lane County and consulting engineering firms on other projects during preconstruction, construction and final project documentation; hold and record a pre-construction meeting with utility companies, contractor, and affected agencies;

B. Recording by video and digital photo, the pre-construction condition of the construction site, monitoring and inspecting the construction and contractor's schedule, temporary and permanent traffic control, and legal documents;

C. Providing routine and timely construction inspections;

D. Ordering and directing construction materials testing and reviewing testing results for conformance with the project;

E. Maintaining daily and weekly inspection reports of construction activities;

F. Conducting and recording weekly construction meetings with City and Contractor;

G. Assuring construction pay quantities are measured and documented prior to backfill or burying;

H. Determining construction progress payments;

I. Preparing and administering change of work orders. All construction contract change orders shall be approved by the City Engineer and signed by both the City Engineer and MSA's Project Engineer;

J. Re-measuring the unit quantities contained in the contract and calculating a final payment amount when construction is complete and before final payment;

K. Performing construction staking;

L. Surveying final construction conditions.

Task 8 – Post Construction Services

Upon completion of the project, all records pertaining to the project shall be attested to by MSA and submitted in detail to the City Engineer. Such records shall include, but not be limited to, the following:

A. As-built plans, from which clearly legible prints can be produced

B. As-built drawings on disc, compatible with the City's electronic system in an AutoCAD format

C. Laboratory and field test reports certified by the Engineer

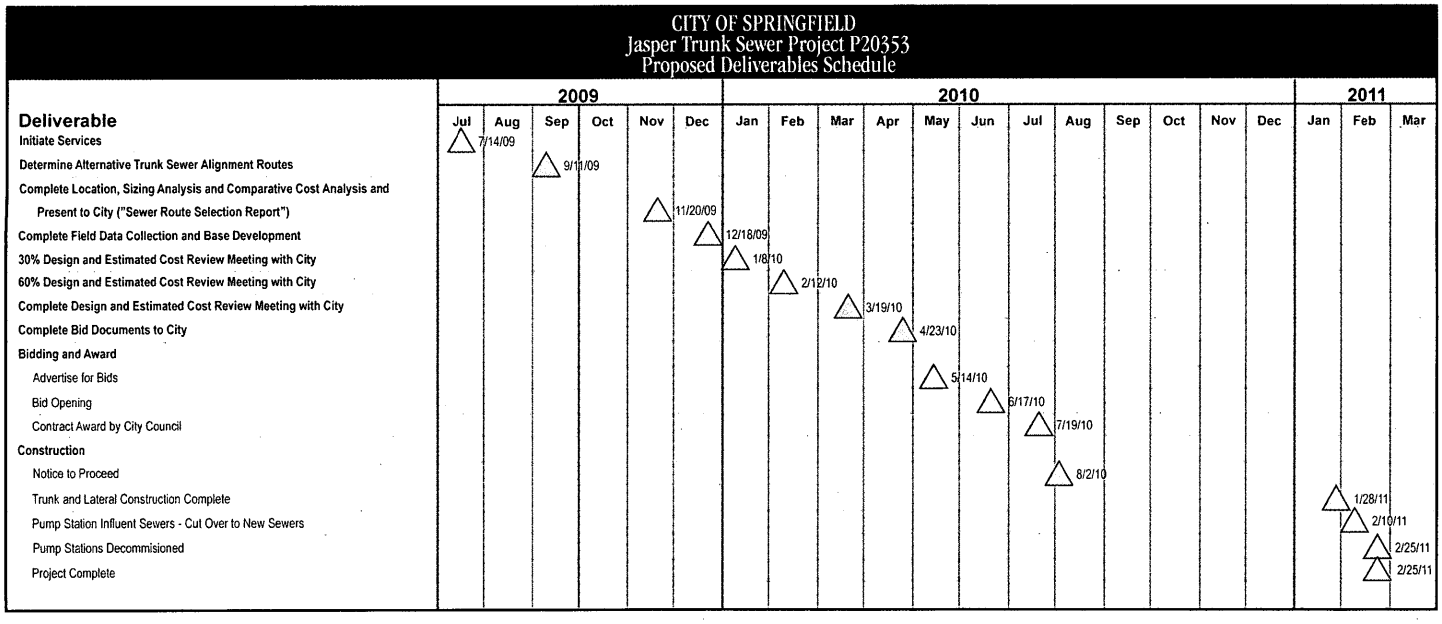
D. Inspection diaries and other documents related to the project

The as-built drawings in hard copy and electronic files shall conform to the requirements in the City's design manual and shall be submitted to the City.

MSA will provide any other services related to the project as requested by the City Engineer. Services such as redesign after final design, or other services which would not be anticipated or are not included as part of the work scope as described above or in the proposal shall be eligible for payment beyond and outside of the not-to-exceed limit as approved by the City Engineer.

Project Deliverables Schedule

The proposed deliverables schedule for the project follows. This schedule reflects the City's deliverable schedule in the RFP with completion of bid documents not later than April 23, 2010. The bidding and award and construction phases are included in the schedule to provide a complete project schedule through completion of construction and abandonment of the pump stations. Assuming a conventional design-bid-build approach, construction of the project can be anticipated by the end of February, 2011.



Preliminary Drawing List

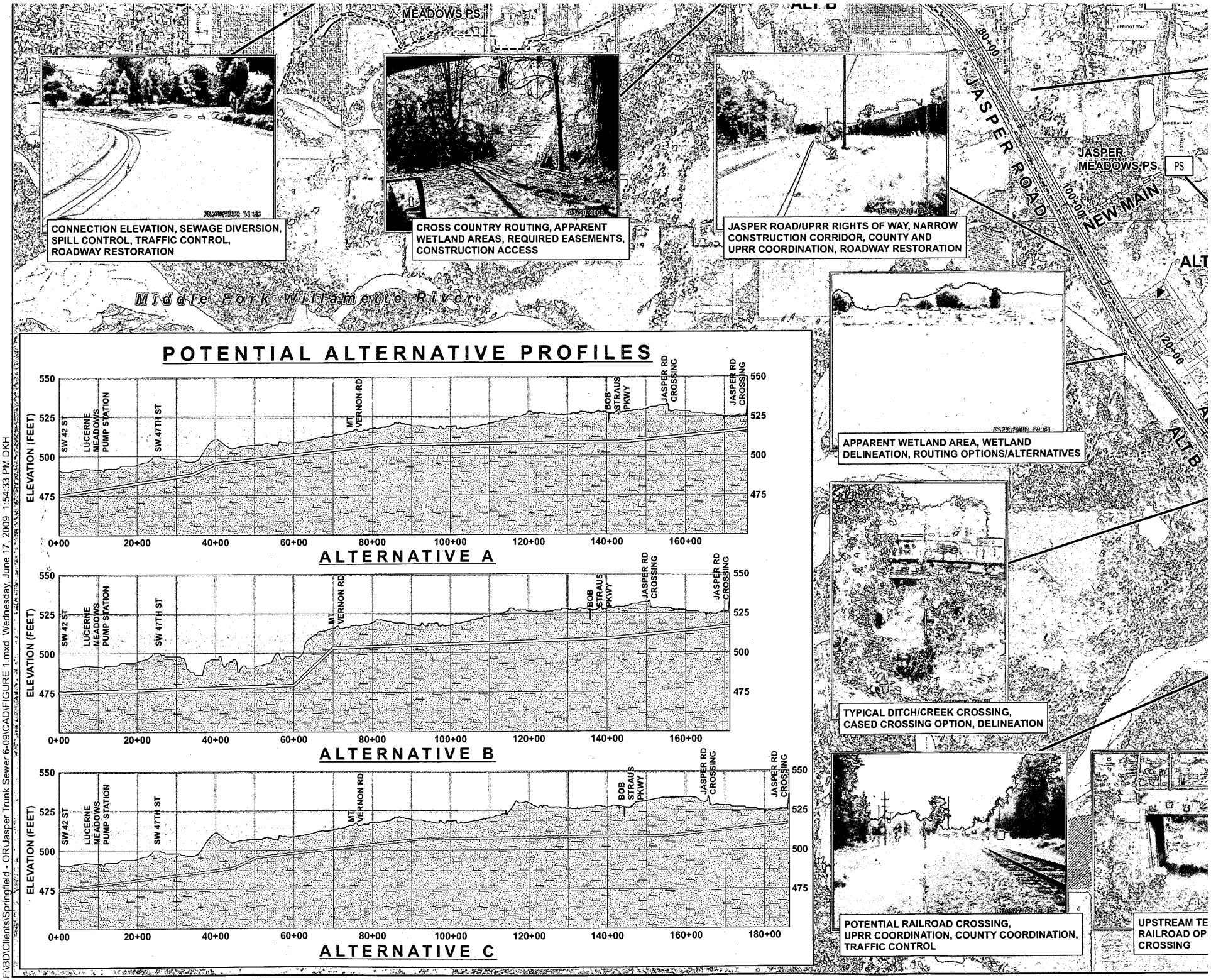
The following is the anticipated list of drawings for the project:

1	G-1	Title Sheet, Vicinity Map and Location Map
2	G-2	Index of Drawings and Drawing Key Map
3	G-3	General Notes and Abbreviations
4	G-4	Topographic Legend and Erosion Control Notes
5	G-5	Survey Notes and Monumentation Map
6	G-6	Erosion Control Details
7-38	C-1 to C-32	Plan and Profile – Jasper Road Trunk Sewer (17,400 ft. – 1"=20' - 32 sheets)
39-41	C-33 to C-35	Plan and Profile – Lateral Sewer to Jasper Meadows Pump Station (1,300 ft. – 1"=20' – 3 sheets)
42	C-36	Misc. Details 1- Bored and Jacked Casings – Sections & Details
43	C-37	Misc. Details 2 – County Road Surface Restoration – Sections & Details
44	C-38	Misc. Details 3 – Pump Station Decommissioning and Site Restoration – Plans, Sections and Details
45	C-39	Misc. Details 4 – Miscellaneous Details
46	C-40	Misc. Details 5 – Miscellaneous Details

Preliminary Bid Package Table of Contents

The following is the preliminary bid package table of contents for the project:

1. Engineer's Seal and City's Concurrance
2. Complete Bid Submittal Notification
3. Invitation to Bidders
4. Instruction to Bidders
5. Unit Price Bid Proposal
6. Bid Item List
7. Bid Bond
8. Proposal Guarantee
9. Certificates of Compliance
   - Prevailing Wage Rate Requirements and Information
   - Nondiscrimination
   - Residency
   - Licensing with Contractor's Board
   - Employee Drug Testing Program
10. First-tier Subcontractor Disclosure Form
11. Contract Form
12. Performance Bond Form
13. Payment Bond Form
14. Statutory Public Works Bond
15. List of Contractors Ineligible to Receive Public Works Contracts
16. Special Provisions
17. Geotechnical Investigation Report
18. Easements
19. Record Drawings
    - Lucerne Pump Station
    - Golden Terrace Pump Station
    - Jasper Meadows Pump Station
    - Jasper Road Trunk at 42nd Street
20. Permits and Approvals
    - Union Pacific Railroad
    - Lane County
    - Environmental Permits (Corps, DSL, DEQ, etc.



F:\BD\Clients\Springfield - OR\Jasper Trunk Sewer 6-09\CAD\FIGURE 1.mxd Wednesday, June 17, 2009 1:54:33 PM DKH

General

Murray, Smith & Associates, Inc. (MSA) is proud of the reputation that we have built since the firm's founding in 1980. Listed below is a summary of client references for whom we have completed recent and relevant project work. These individuals are familiar with our firm through our current and repeat work and will verify MSA's excellent reputation and strong qualifications for the contemplated scoping, design and installation of the Jasper Trunk Sewer project for the City of Springfield. We encourage you to contact any or all of these individuals.

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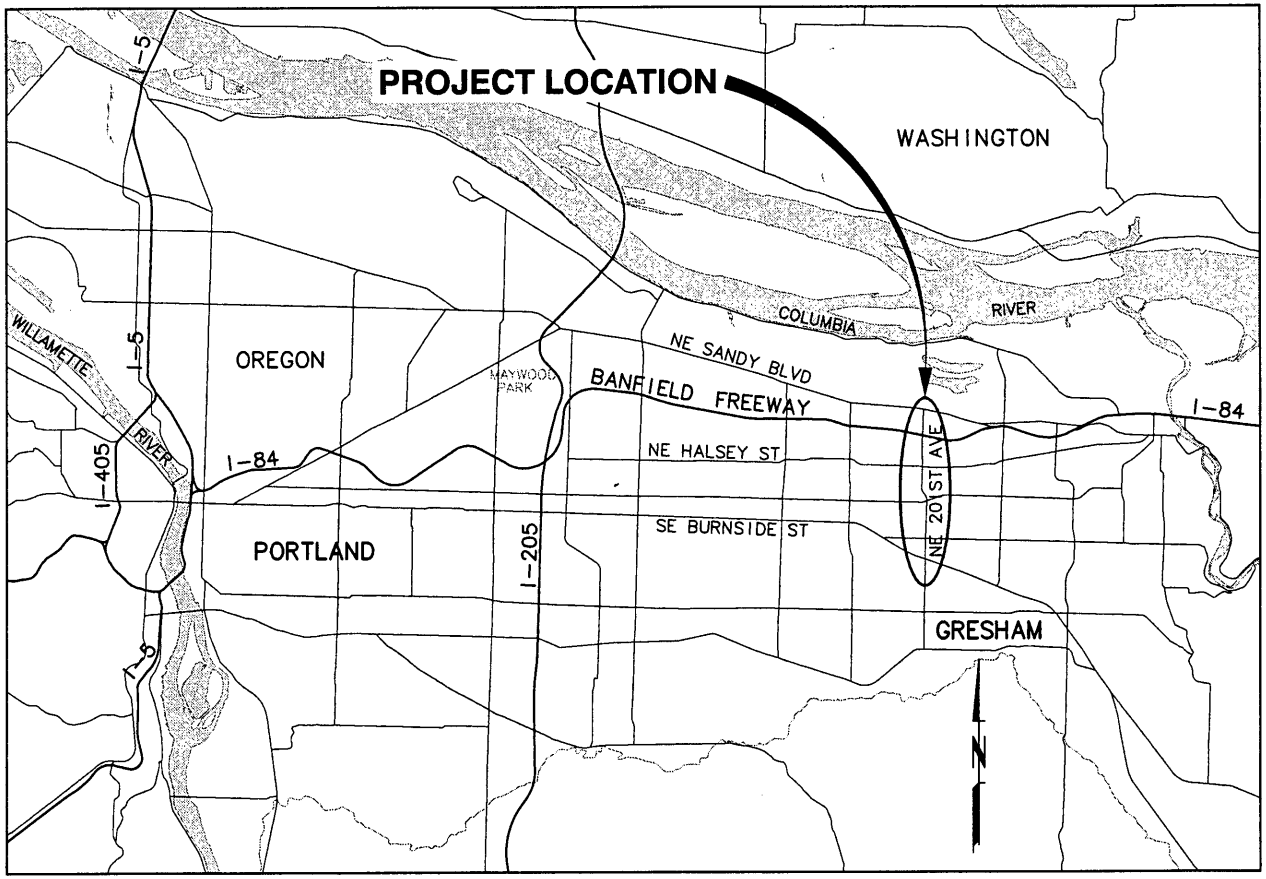
MSA

APPENDIX

MSA

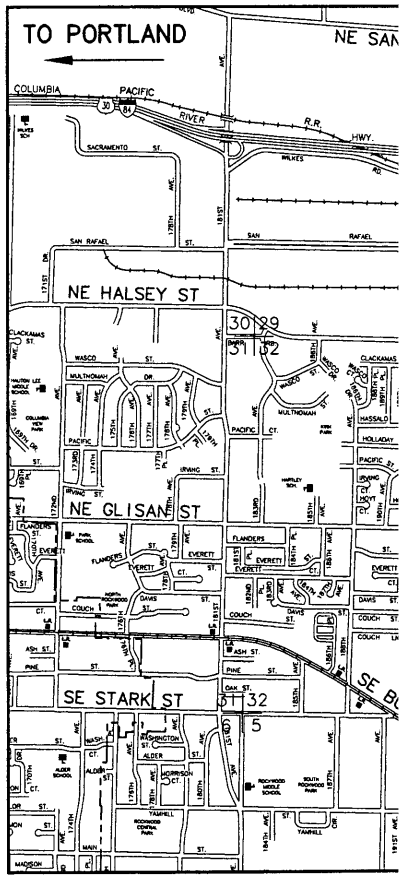
Sample Plans

MAY 2002



VICINITY MAP

SCALE: 1"=7,000'



SHEET INDEX

GENERAL

1	G-1	TITLE SHEET/VICINITY MAP/LOCATION MAP/SHEET INDEX
2	G-2	KEY MAP/ABBREVIATIONS/LEGEND
3	G-3	GENERAL NOTES/EROSION CONTROL NOTES
4	G-4	EROSION/SEDIMENTATION CONTROL PLAN

SANITARY SEWER

5	SS-1	PLAN & PROFILE STA 1+00 TO STA 4+60
6	SS-2	PLAN & PROFILE STA 4+60 TO STA 9+80
7	SS-3	PLAN & PROFILE STA 9+80 TO STA 15+00
8	SS-4	PLAN & PROFILE STA 15+00 TO STA 20+20
9	SS-5	PLAN & PROFILE STA 20+20 TO STA 25+40

SANITARY SEWER CONTINUED

*	SS-6	PLAN & PROFILE STA 25+40 TO STA 30+60
*	SS-7	PLAN & PROFILE STA 30+60 TO STA 35+80
*	SS-8	PLAN & PROFILE STA 35+80 TO STA 41+00
*	SS-9	PLAN & PROFILE STA 41+00 TO STA 46+20
*	SS-10	PLAN & PROFILE STA 46+20 TO STA 51+40
*	SS-11	PLAN & PROFILE STA 51+40 TO STA 56+60
*	SS-12	PLAN & PROFILE STA 56+60 TO STA 61+80
*	SS-13	PLAN & PROFILE STA 61+80 TO STA 67+00
*	SS-14	PLAN & PROFILE STA 67+00 TO STA 72+20
*	SS-15	PLAN & PROFILE STA 72+20 TO STA 77+40
*	SS-16	PLAN & PROFILE STA 77+40 TO STA 82+60
*	SS-17	PLAN & PROFILE STA 82+60 TO STA 87+80

SANITARY SEWER C

*	SS-18	PLAN
*	SS-19	PLAN
*	SS-20	PLAN
*	SS-21	PLAN
*	SS-22	PLAN

DETAILS

10	D-1	STRU
11	D-2	STRU
12	D-3	TYPI
13	D-4	MISC
14	D-5	MISC

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SOUTHEAST INTERSECTION WITH PROPERTY LINE:
STATION 1+87.51, 10.82 FEET LEFT
N690939.57, E1499075.82

4. COORDINATES FOR TEMP EASE:
NORTHWEST INTERSECTION WITH PROPERTY LINE:
STATION 0+99.47, 7.04 FEET LEFT
N6901017.34, E1499048.27

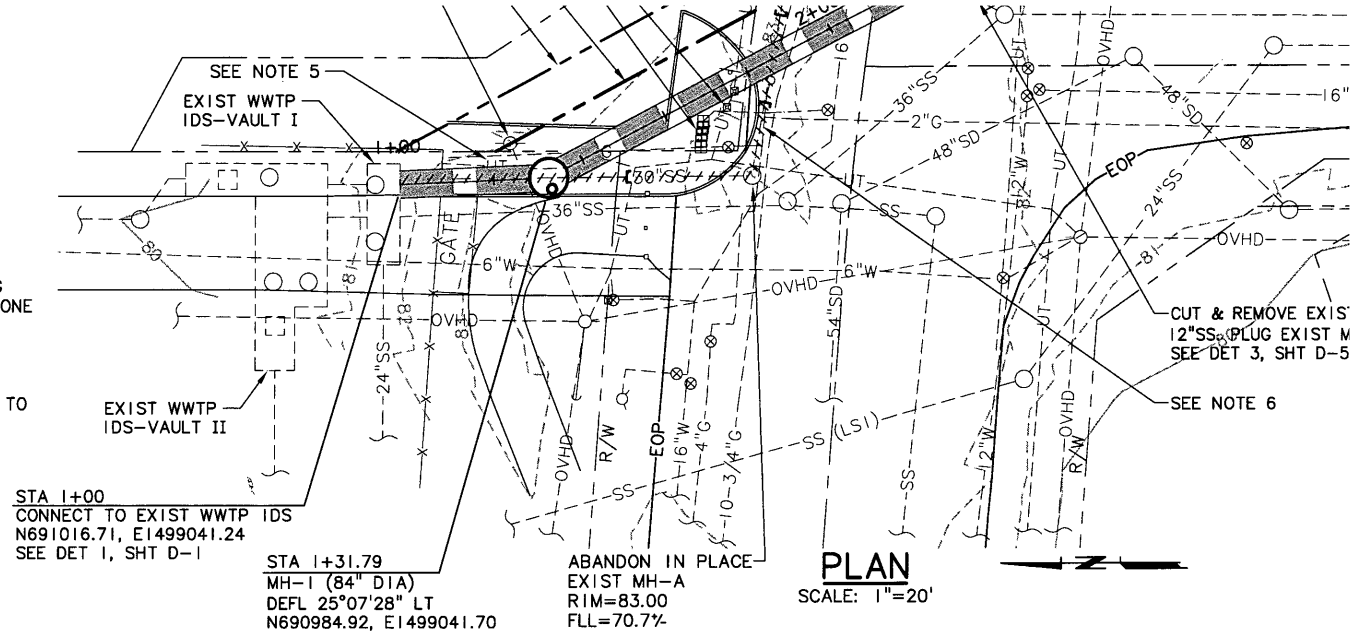
SOUTHEAST INTERSECTION WITH PROPERTY LINE:
STATION 1+94.96, 20.89 FEET LEFT
N690937.28, E1499088.13

5. CONTACT VERIZON FOR RELOCATION OF EXISTING UNDERGROUND TELEPHONE AND TEMP SUPPORT OF PHONE PEDESTALS IN VICINITY OF MANHOLE-1.

6. ABANDON EXISTING 30-INCH SS IN-PLACE FROM STATION 1+47, 8 FEET RIGHT TO STATION 1+80, 8 FEET RIGHT AND FROM STATION 1+92, 8 FEET LEFT TO STATION 2+03, 8 FEET LEFT.

7. LOCATION OF PULL BOXES AND COMMUNICATIONS CONDUIT SHOWN SCHEMATICALLY FOR CLARITY. INSTALL ACCORDING TO DETAILS 1 AND 2 ON SHEET D-5 AND THE PROVIDED STATIONING.

8. INSTALL PIPE ZONE MATERIAL FROM STATION 2+40 TO STATION 2+66 ACCORDING TO TRENCH SECTION B.



PLAN

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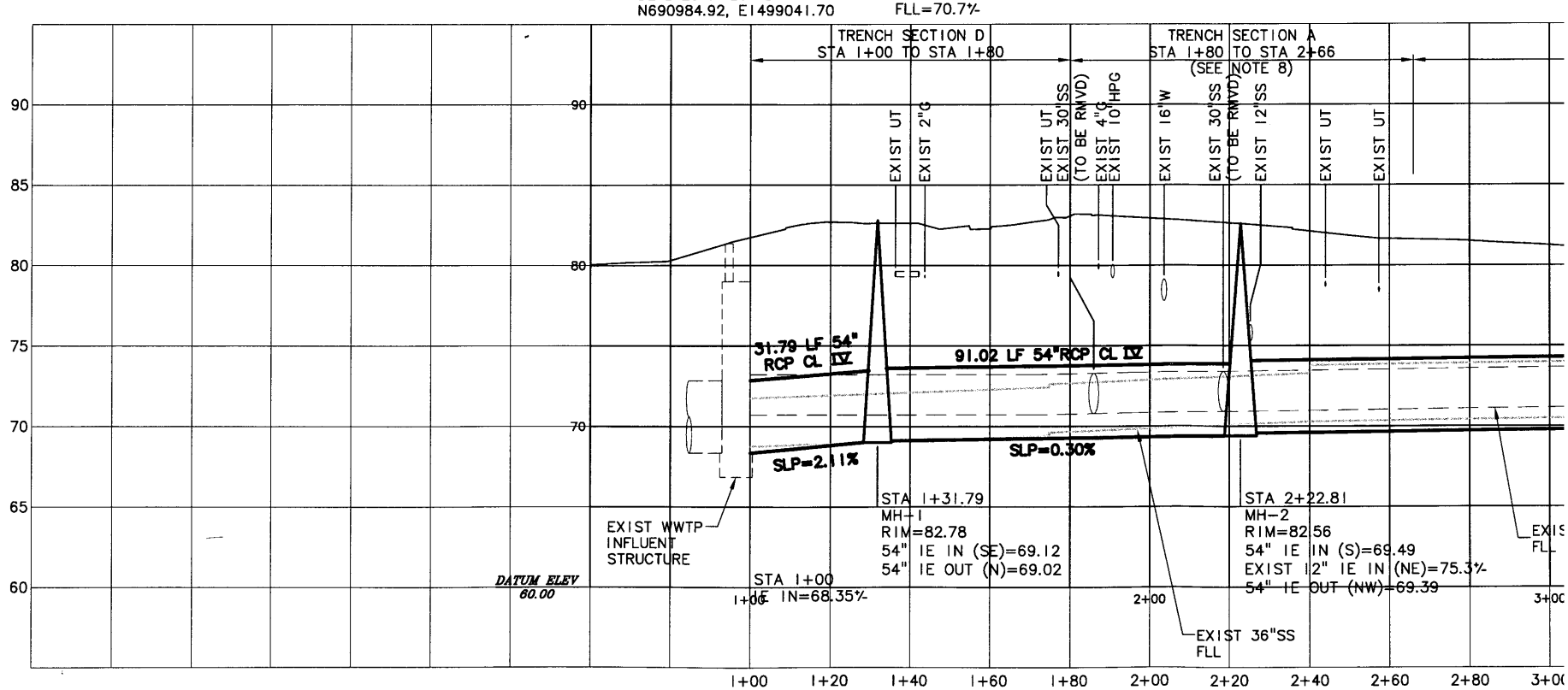

PROFILE

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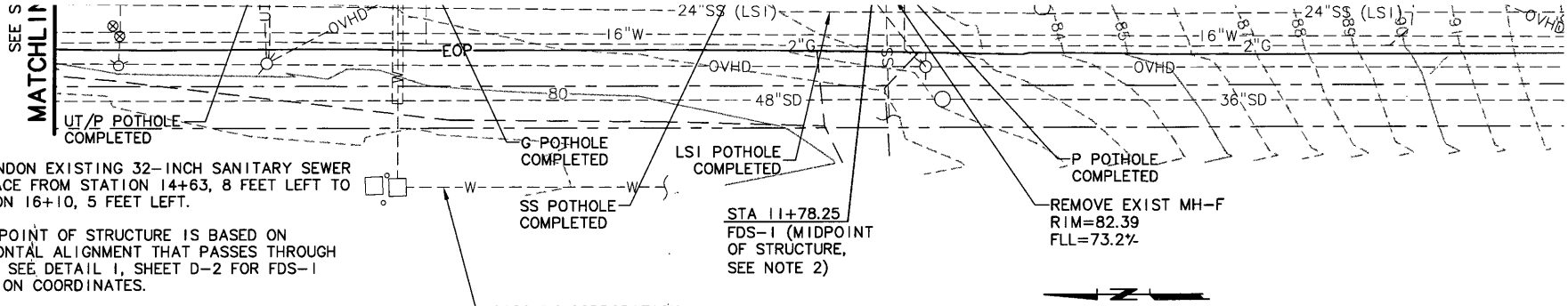

NOTE:

1. ABANDON EXISTING 32-INCH SANITARY SEWER IN-PLACE FROM STATION 14+63, 8 FEET LEFT TO STATION 16+10, 5 FEET LEFT.

2. MIDPOINT OF STRUCTURE IS BASED ON HORIZONTAL ALIGNMENT THAT PASSES THROUGH FDS-1. SEE DETAIL 1, SHEET D-2 FOR FDS-1 LOCATION COORDINATES.

3. 20-INCH STEEL CASING ENCASES 4 4-INCH DIAMETER HDPE WATERLINES AND 4 PVC CONDUITS WITH ELECTRICAL AND CONTROL WIRING. OFFSET SANITARY SEWER BELLS TO AVOID CONFLICT WITH EXISTING STEEL CASING.

PLAN

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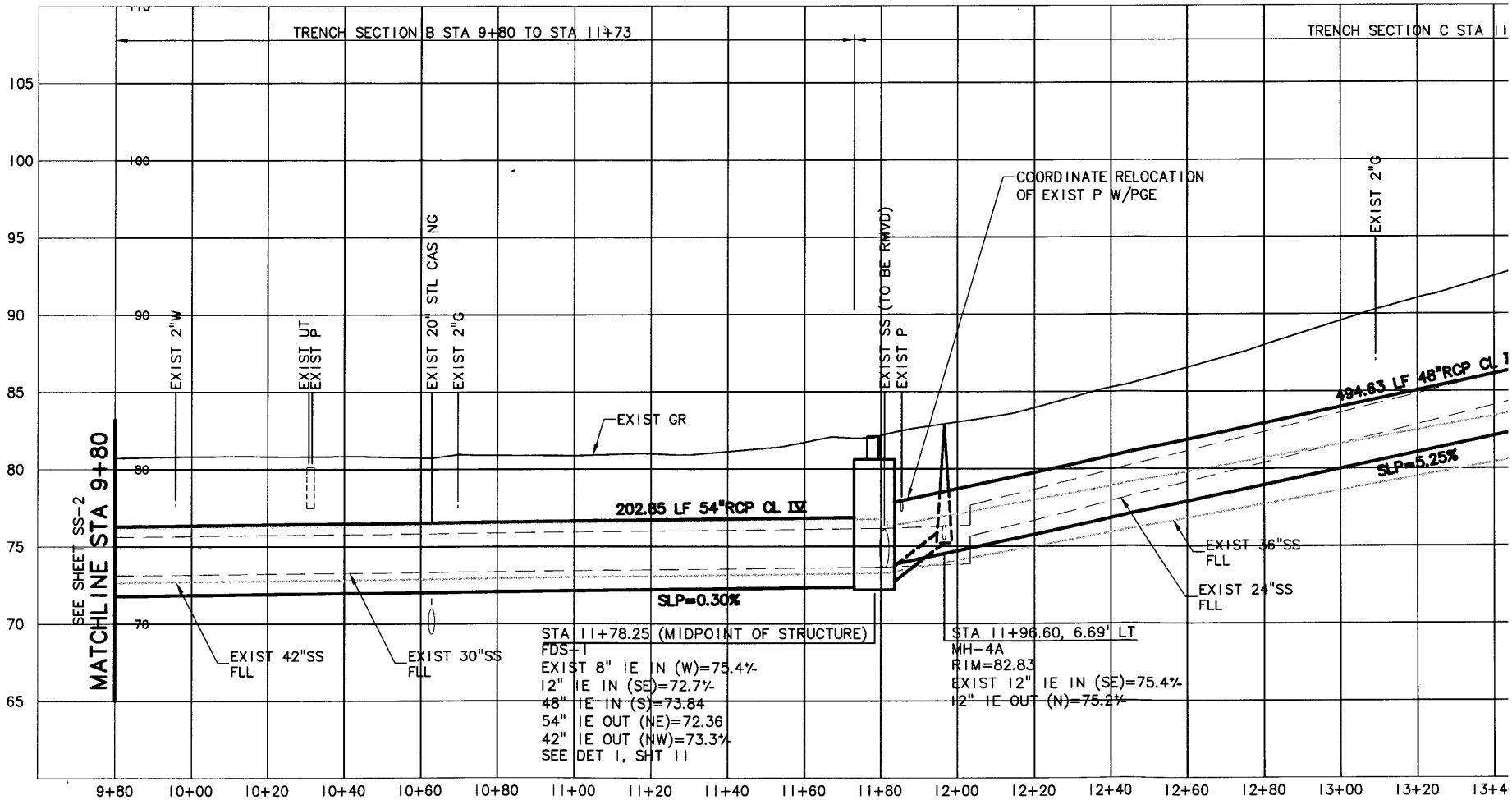

PROFILE

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SEWER SYSTEM IMPROVEMENTS

CONSTRUCTION WO

SHEET INDEX

GENERAL SHEETS

G1 COVER AND TITLE SHEET, VICINITY MAP & LIST OF DRAWINGS
G2 LEGEND & ABBREVIATIONS
G3 GENERAL NOTES

CIVIL

C1 3RD AVE SE – FORCE MAIN & GRAVITY SEWER PLAN & PROFILE STA 10+00 TO STA 14+80
C2 3RD AVE SE – FORCE MAIN PLAN & PROFILE STA 14+80 TO STA 19+80
C3 3RD AVE SE – FORCE MAIN PLAN & PROFILE STA 19+80 TO STA 24+80
C4 3RD AVE SE – FORCE MAIN PLAN & PROFILE STA 24+80 TO STA 29+80
C5 3RD AVE SE – FORCE MAIN & GRAVITY SEWER PLAN & PROFILE STA 29+80 TO STA 34+80
C6 3RD AVE SE – FORCE MAIN & GRAVITY SEWER PLAN & PROFILE STA 34+80 TO STA 38+20
C7 3RD AVE SE – FORCE MAIN PLAN & PROFILE STA 38+20 TO STA 42+00
C8 92ND ST SE – GRAVITY SEWER PLAN & PROFILE STA 10+00 TO STA 14+80
C9 92ND ST SE – GRAVITY SEWER PLAN & PROFILE STA 14+80 TO STA 19+80
C10 92ND ST SE – GRAVITY SEWER PLAN & PROFILE STA 19+80 TO STA 24+80
C11 92ND ST SE – GRAVITY SEWER PLAN & PROFILE STA 24+80 TO STA 29+80
C12 92ND ST SE – GRAVITY SEWER PLAN & PROFILE STA 29+80 TO STA 34+80
C13 92ND ST SE – GRAVITY SEWER PLAN & PROFILE STA 34+80 TO STA 39+80
C14 3RD AVE SE – SURFACE RESTORATION STA 10+00 TO STA 19+80
C15 3RD AVE SE – SURFACE RESTORATION STA 19+80 TO STA 29+80
C16 3RD AVE SE – SURFACE RESTORATION STA 29+80 TO STA 39+80
C17 3RD AVE SE – SURFACE RESTORATION STA 39+80 TO STA 42+00
C18 92ND ST SE – SURFACE RESTORATION STA 10+00 TO STA 19+80
C19 92ND ST SE – SURFACE RESTORATION STA 19+80 TO STA 29+80
C20 92ND ST SE – SURFACE RESTORATION STA 29+80 TO STA 39+80

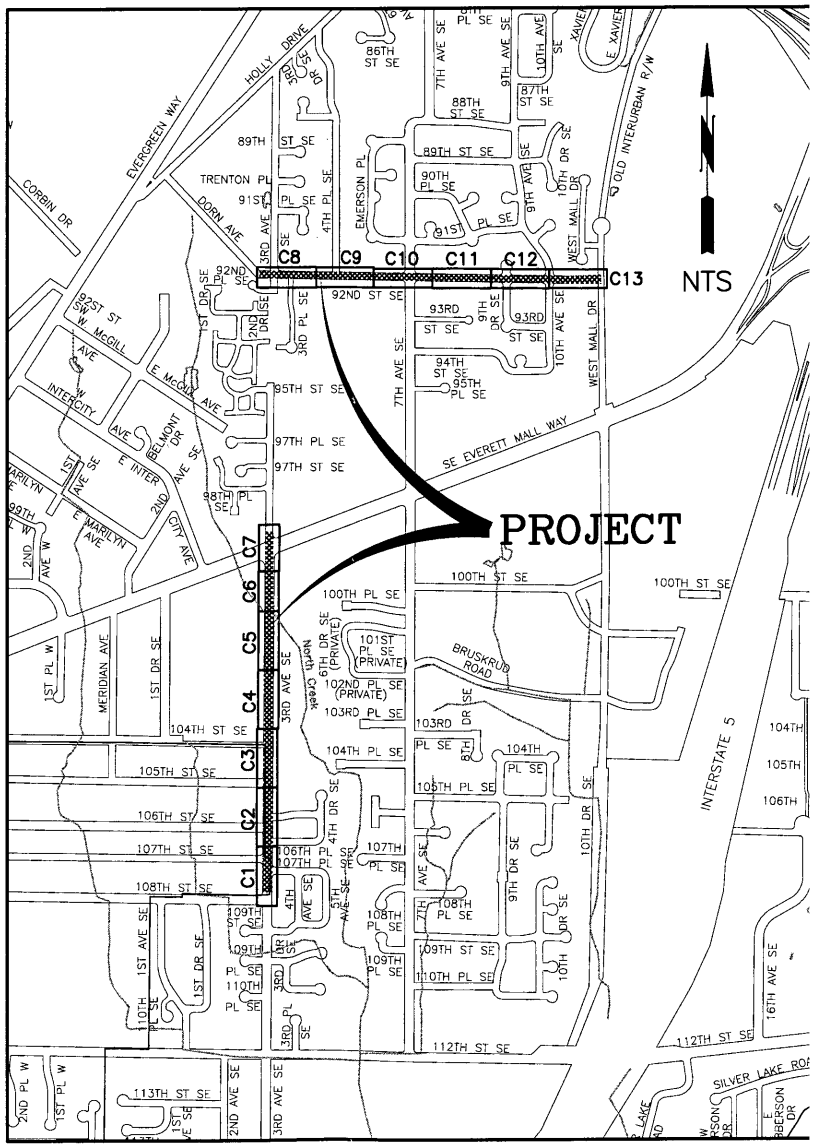
MISCELLANEOUS PLANS

D1 GENERAL CIVIL DETAILS
D2 GENERAL CIVIL DETAILS
D3 GENERAL CIVIL DETAILS
D4 GENERAL CIVIL DETAILS
D5 GENERAL CIVIL DETAILS
TC1 3RD AVE SE – TRAFFIC CONTROL PLAN
TC2 92ND ST SE – TRAFFIC CONTROL PLAN
SC1 3RD AVE SE – SURVEY CONTROL PLAN
SC2 92ND ST SE – SURVEY CONTROL PLAN
SC3 92ND ST SE – CONSTRUCTION & PERMANENT EASEMENTS

CAUTION

UNDERGROUND UTILITIES
CONTRACTOR TO VERIFY
EXACT LOCATION AND DEPTH

CALL 2 BUSINESS DAYS BEFORE YOU DIG
1-800-424-5555



VICINITY MAP

NO.	DATE	APRVD	REVISION

BID			CONST			AS-BLT		
DATE	APRVD	ACTION:	DATE	APRVD	ACTION:	DATE	APRVD	ACTION:

THOMAS JAMES PERRY
STATE OF WASHINGTON
39707
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 3-27-08

T:\ACad\EVT-Templates\BASIC DESIGN DRAWINGS\Evt-Gen-Shts.dwt <Cover G1> JAN 05 2006 15:27:13
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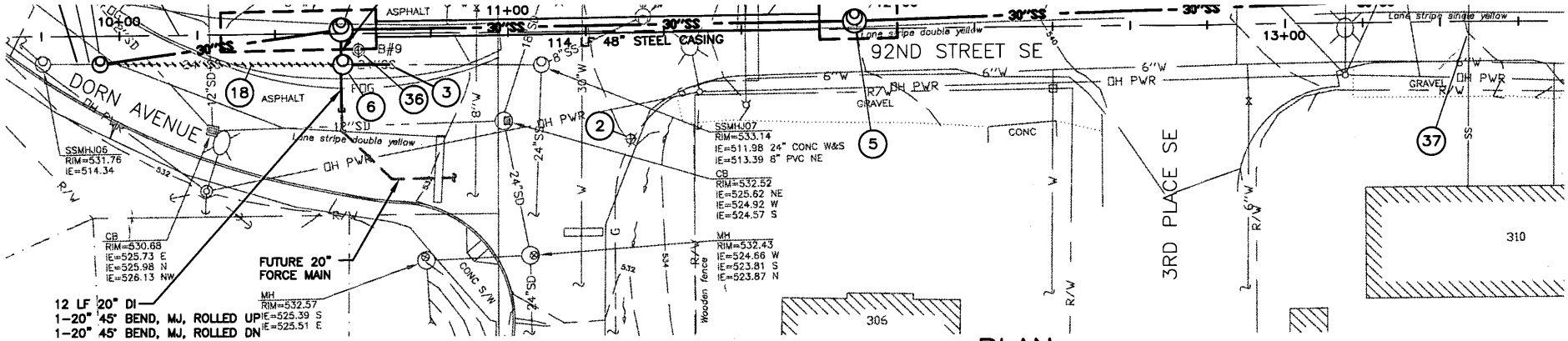
Date:
Drawn By: DKH



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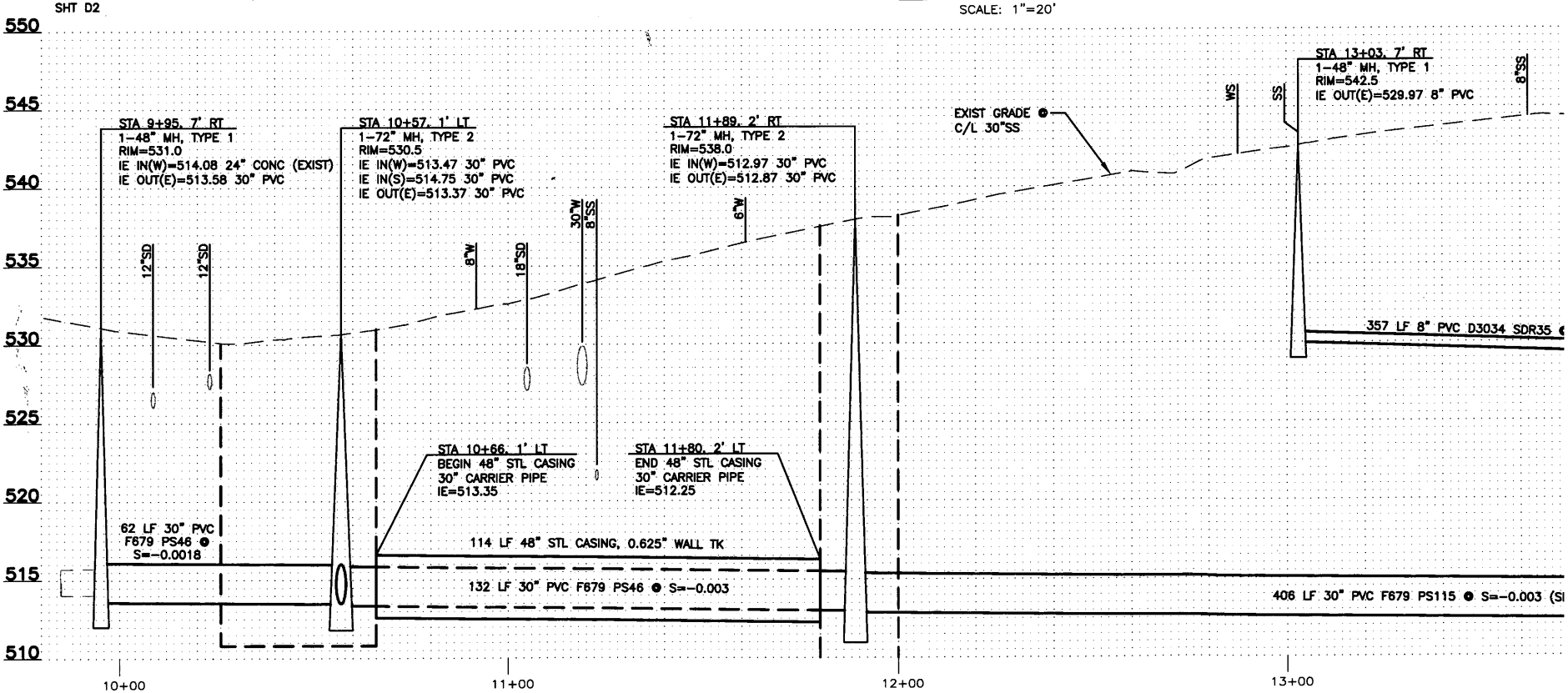

PROFILE

SCALE: HORZ: 1"=20'
VERT: 1"=5'

NO.	DATE	APRVD	REVISION

PLANS ISSUED FOR:

BID			CONST			AS-BLT		
DATE	APRVD	ACTION:	DATE	APRVD	ACTION:	DATE	APRVD	ACTION:

THOMAS JAMES TERRY, STATE OF WASHINGTON, 39797, REGISTERED PROFESSIONAL ENGINEER, EXPIRES: 3-27-08

Scale: Horiz: 1"=20' Vert: 1"=5'
Designed By: NPH/CES
Inspected By:
W.O. No.: UP3271
Date: 2-28-08

EVERETT

CITY OF EVERETT
PUBLIC WORKS
UTILITIES DEPARTMENT

SEWER SY
IMPROVEMENTS "K"

MSA

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XREF Filename:
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Checked By: TJP
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Surveyed By:
Date:
Control Monument:
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Recorded Survey
Snohomish County Auditor
AF
Vol/Bk Page
Constructed By:
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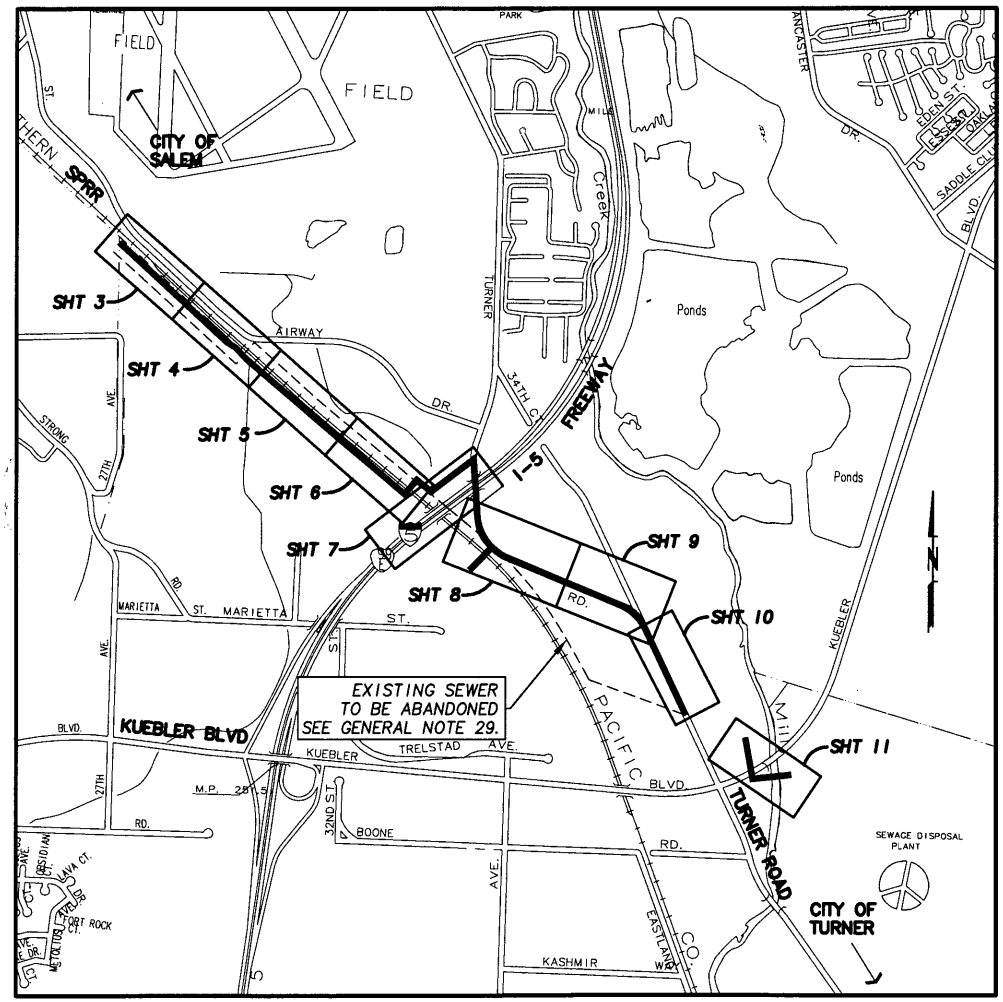
U.S.C.I.
SANITARY SEWER SYSTE
PHASE 2

MARCH 1997



INDEX MAP

SCALE: 1" = 1000'

MSA

Murray, Smith & Associates, Inc.
Engineers/Planners
Portland, Oregon

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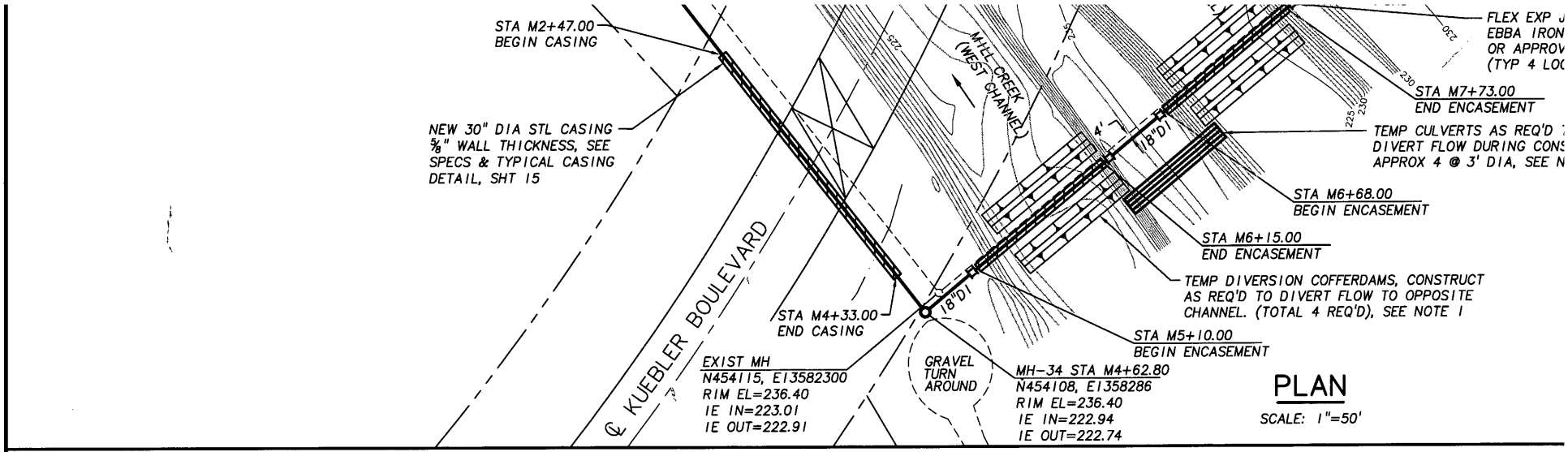

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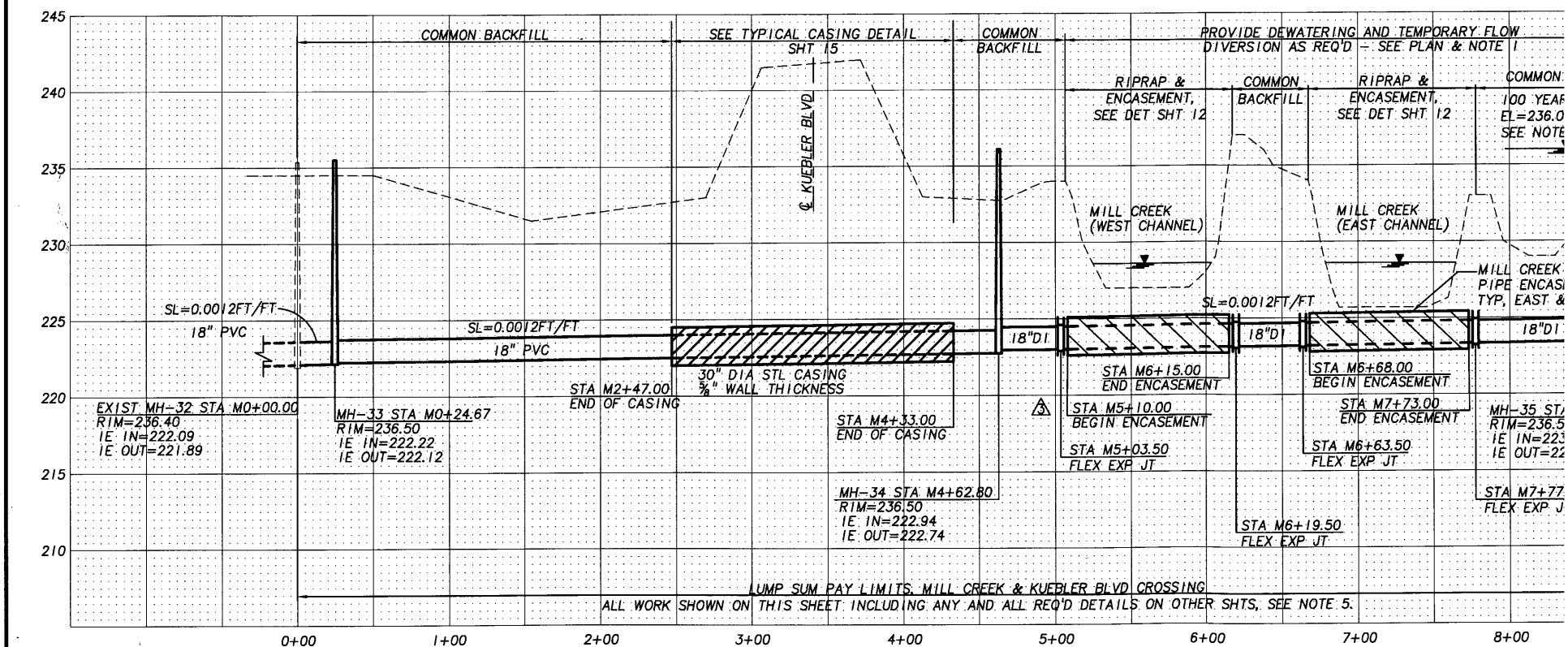

PROFILE

SCALE: 1"=50'H, 1"=5'V

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MSA

175 West B Street, Bldg. K-2 ▫ Springfield, Oregon 97477 ▫ www.msa-ep.com