



# JAMES RIVARD, PE

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## SENIOR CLIENT MANAGER

### Professional Profile

Jim has over 35 years of experience, with a diverse background in engineering and construction in both the private and public sectors. He has an extensive background managing a wide variety of projects including water system master plans, design and construction management of: new water and sewer mains, water main cleaning and lining, water and sewer pumping stations, water storage facilities, water treatment facilities and operations facilities. His particular expertise is with water works facilities, a role that he held for several years as Director of Maintenance Engineering and Construction for the MWRA. In this role, he directed development and implementation of waterworks system capital improvement and maintenance programs totaling more than \$120 million. Projects included rehabilitation, replacement, and the construction of new treatment facilities, pumping stations, and pipelines. Jim directed the MWRA's in-house engineering staff which developed project contract documents and provided engineering support to operations staff.

### Stormwater Professional Profile

Jim has over 35 years of experience, with a diverse background in engineering and construction in both the private and public sectors. He was the Director of Maintenance Engineering and Construction for the MWRA for a number of years. Jim has an extensive background managing a wide variety of projects including planning, design, and construction management of numerous water, wastewater, and stormwater projects for municipalities throughout Massachusetts. He understands the needs of his municipal clients and has assisted his municipal clients in obtaining over \$45 million in SRF loans and federal grants for municipal projects.

### Related Experience

**Gwinnett County, GA – Alcovy River Basin Sewer Model.** Principal-in-Charge on the development of the updated sanitary sewer model of Alcovy River sanitary sewer basin utilizing SewerGEMS v10, including 2,726 manholes, 95 miles of gravity sewer, 15 pump stations, and 22 miles of force main. Tasks included updating existing sewer geometry with recent GIS data, and importing existing pump station performance data and water use records. Calibrated the model for wet and dry weather using water use records, pump station and flow meter data, and rain gage data. Authored the model documentation report, including data analysis, charts, capacity evaluation, and summary and recommendations.

**City of Worcester, MA – Ozone System Replacement.** Principal-in-Charge for the evaluation, design, and construction of a complete ozone system replacement at the City's 50 MGD surface water treatment facility where ozone is utilized for

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### Education

- Bachelors, Civil Engineering, Greater Lowell Technical School

### Registrations

- Professional Engineer, MA

### Professional Associations

- American Society of Civil Engineers, Member
- American Water Works Association, Member
- Boston Society of Civil Engineers, Member
- Massachusetts Water Works Association, Member
- New England Water Works Association, Member
- Plymouth County Water Works Association, Member

primary disinfection. The project included a feasibility study relative to the replacement of the existing generation and feed systems, an alternatives evaluation of potential ozone generation technologies, and development of Contract Documents for the construction of the upgrades. Woodard & Curran assisted the City with specification development for the pre-purchase procurement of major equipment and is providing bidding support and construction phase engineering during equipment installation. The resulting system will utilize state-of-the-art systems, greatly improving the reliability, efficiency and safety of the facility.

**Town of Billerica, MA – Comprehensive Water System Evaluation.** Principal-in-Charge for the development of a comprehensive water system evaluation including the 14 MGD surface water treatment facility and associated distribution system. Woodard & Curran performed hydraulic modeling and a complete plant evaluation to develop a 20-year capital improvement plan. The treatment plant, which is approximately 10 years old, utilizes 20-year old ozone generation equipment relocated from a prior facility. The focus of the plant evaluation was to determine replacement options for the ozone equipment. Woodard & Curran performed the evaluation, developed a preliminary design to a level sufficient to obtain SRF funding, and wrote the successful \$10 million state funding application.

**Lowell Regional Transit Authority, Lowell, MA – Owner's Project Manager for Gallagher 1 Garage Modernization.** Principal-in-Charge representing the Owner for coordination, management, and monitoring adherence to the construction schedule, budget, design, and project specifications. The project included removal and replacement of four stories of concrete deck slabs, vehicle ramps, roofing, drainage system, fire alarm system, and emergency lighting.

**City of Lawrence, MA – Water Infrastructure Improvements.** Principal-in-Charge for energy efficiency and infrastructure improvements at the Lawrence Water Treatment Plant and remote sites throughout the distribution. The project included the replacement of several raw and finish water pumps at the treatment plant to reduce energy consumption. The project also included the installation of solar panels next to the plant to provide supplemental power in operation of the water treatment facility and to reduce energy costs.

**Town of Maynard, MA – Water Supply Assessment.** Principal-in-Charge for a project to evaluate additional sources of water to provide redundancy to the Town's existing water supplies. Evaluated reactivating a surface water supply, investigated new ground water sources and increasing the capacity of the existing groundwater wells. This study considered water quality, capacity and permitting along with the capital and operating costs of each alternative.

**City of Leominster, MA – Watershed Protection Plan.** Principal-in-Charge for the development of a Watershed Protection Plan for the three watersheds with a total of seven reservoirs. The plan included the characterization of pollution sources in each of the reservoirs watersheds and a 5-year plan to mitigate the impacts of pollution in all the reservoirs.

**City of Leominster, MA – WTP Upgrades.** Principal-in-Charge for the upgrades to the 4MGD Notown Surface Water Treatment Plant. Project included new upflow clarifiers, new chemical feed and filter to waste systems. Project also included a new 24" and 30" transmission main from the treatment plant to the distribution system. All constructing had to be sequenced to ensure uninterrupted operations of the treatment plant and water supply to the distribution system.

**City of Haverhill, MA – WTP Improvements.** Principal-in Charge for projects at the City's 12-MGD water treatment plant that included improvements to the plant processes, process monitoring, enhancements to the SCADA system, improved security and staff training to implement remote automated operations and to replace the plants 3 vertical turbine finish water pumps.

**City of Lawrence, MA – Mt. Vernon Street Water Main Replacement, Contract 3.** Principal-in-Charge for the Design, Bidding, and Construction Phase Engineering Services for a water main replacement project, which included the replacement of approximately 3,200 linear feet of existing water main, including domestic services, sideline connections, fire hydrants, temporary water bypass, trench paving, final full width road reclamation, and environmental controls. Design duties included the development of plans and specification, managing junior engineers and drafters to assist in the design effort, QA/QC of all work conducted by junior staff, and coordination with local & state agencies, including the City. Bidding duties included advertising in local and state publications, and assistance with the development of addendum. Construction phase Duties included site inspections, supervision of resident engineer, shop drawing review, review and

processing of payment requisitions and change orders, project meetings, coordination with local and state agencies, overall project quality control, final punch-list, QA/QC of record drawings, and project close-out.

**City of Lawrence, MA – Mount Vernon Water Tanks Rehabilitation Project, Contract 7.** Principal-in-Charge for the Design, Bidding, and Construction Phase Engineering Services for the rehabilitation of two (2) elevated water storage tanks, which included the sand blasting and coating the interior and exterior surfaces, safety upgrades, overflow modification, and site modifications. Design duties included the development of specification, managing junior engineers and drafters to assist in the design effort, QA/QC of all work conducted by junior staff, and coordination with local & state agencies, including the City. Bidding duties included advertising in local and state publications, and assistance with the development of addendum. Construction phase Duties included site inspections, supervision of resident engineer, shop drawing review, review and processing of payment requisitions and change orders, project meetings, coordination with local and state agencies, overall project quality control, final punch-list, and project close-out.

**City of Lawrence, MA - Distribution System Hydraulic Model.** Principal-in-Charge for the development and calibration of a hydraulic model of the City's water distribution system. The model was used to develop a unidirectional flushing program and valve exercising report. The model was also used to perform Extended Period Simulations of distribution system flow to satisfy the System Specific Study (SSS) criteria for the Initial Distribution System Evaluation (IDSE) phase of the Stage 2 D/DBPR. The completion of the model and IDSE using the SSS methodology saved the City significant time and money associated with sampling of distribution system water quality.

**Town of Cumberland, RI – Asset Evaluation.** Principal-in-Charge responsible for working with the Town to provide asset valuation services and expert witness testimony related to the town's water system assets. Woodard & Curran collected available data including length, diameter, material and age of pipes, number of service connections and hydrants, and physical geometry of the dams and interviewed staff regarding infrastructure condition. We also utilized industry-published standard construction cost indices to adjust the single year valuation to the two prior years as required by the Town. Our final report to the Town included a comprehensive valuation of the RCN less depreciation of each of the studied assets and became the basis for the Town's tax determination.

**Town of Maynard, MA – Greensand Filtration Media Replacement.** Project Manager for the design, bidding and construction administration for the removing and disposing, replacing and regenerating the existing media in the four greensand filters at the Old Marlborough Road Water Treatment Plant.

**Town of Maynard, MA – Water System Technical Support.** Project Manager for the evaluation of the Old Marlborough Road water treatment plant, including assessment and replacement of filter media, filter valves, rebuilding chemical feed and filter backwash systems. Providing emergency operations support, water system SCADA enhancements, assistance with annual statistical and water quality reporting and general engineering support.

**Town of Maynard, MA – WWTP Upgrade.** Serves as Owner's Project Manager (OPM) for the upgrades to the Town's Wastewater Treatment Plant upgrade project. OPM role started during the design of the upgrades, continued during the bidding process and during the ongoing construction.

**Town of Maynard, MA – Water and Sewer Rate Study.** Project Manager for completing a study to evaluate and update the Town's water and sewer rates. The study included also recommendations for going from a biannual to quarterly billing program.

**Town of Maynard, MA – WWTF Upgrades.** Served as Owner's Project manager for the upgrade of the Maynard Wastewater Treatment Facility. The upgrade included a CoMag tertiary phosphorus removal system.

**Town of Marlborough, MA – Westerly WWTF Upgrade Owner's Project Manager.** Managing OPM Services during design and construction for the ongoing \$26 million upgrade and expansion (to 4.15 MGD) of Marlborough's Westerly WWTF. The upgrade incorporates a BluePro tertiary phosphorus removal system to meet a 0.7 mg/L phosphorus limit.

**Lowell Regional Wastewater Utility, MA – Aeration Blower Upgrades.** Client manager for an evaluation of the facility's four 450 hp blowers. Worked with the client and other disciplines in the design of interim improvements to keep the existing blowers on line and with the evaluation of new high speed blowers to improve energy efficiencies. Project included the design of the aeration improvements. The four 450 hp blowers were replaced with three 350 hp and one 250 hp blower.

**Town of Winthrop, MA – Sewer and Water Main Replacement.** Project was partially funded through the MWRA Local Pipeline Assistance Program. Client Manager responsible for overseeing design, bidding and construction administration of 1,300 linear feet of water main improvements. Woodard & Curran assisted the Town in securing MWRA funding for the project by completing Local Pipeline Assistance application.

**Town of Winthrop, MA – Sewer and Water Main Replacement.** Client Manager responsible for overseeing the design and construction administration of approximately 2,100 linear feet of sewer main replacement and 650 linear feet of drainage improvements. The project included sewer main replacement through contaminated soils requiring URAM (soil sampling and disposal limitations) and improving capacity of local drainage by upgrading drain system. Woodard & Curran assisted the Town in securing MWRA funding for the project by completing Local Financial Assistance application.

**Town of Winthrop, MA – Infrastructure Improvements.** Client Manager responsible for managing sewer infrastructure improvements to evaluate and mitigate inflow/infiltration in the collection system. The project assisted the Town in securing MWRA funding due to expire by developing a design that would immediately utilize funds and address inflow/infiltration issues through video inspection, joint sealing and pipe lining. Woodard & Curran completed MWRA funding application to assist Town in funding the project, developed design and construction documents and provided construction administration. Based on video inspection information from the project, Woodard & Curran provided the Town with a Sanitary Sewer Evaluation Report. The report identified critical collection system repairs and recommended a five year plan for improvements. Woodard & Curran is assisting the Town in implementing the five year plan.

**Dracut Water Supply District, MA – Water System Master Plan.** Client Manager for the evaluation of the water supply and distribution system and the preparation of a phased capital improvement plan. The District obtains its water supply from seven wells and supplements it with water purchased from Lowell. The project included the development of a computer hydraulic model of the distribution system.

**City of Lowell, MA – Water System Sanitary Survey Implementation Assistance.** Client Manager for this project to provide technical assistance to address items that MADEP required the City of Lowell to take to address issues identified in a Sanitary Survey. These items included changes in chemical feed lines, develop SOPs for instrumentation maintenance, increased security, providing documentation related to the cross connection survey including scheduling of all necessary surveys and Update the water system's Emergency Response Plan.

**Town of Maynard, MA – Water System Technical Support.** Client Manager for the evaluation of water treatment plant off line for two years including assessment and replacement of filter media, filter valves, rebuilding chemical feed and filter backwash systems. Providing emergency operations support, water system SCADA enhancements, and development of a unidirectional flushing program.

**City of Lawrence MA – Water System Administrative Consent Order support.** Client Manager for providing assistance to the City of Lawrence Water Department to address track and report to DEP on compliance with a MADEP ACO . There were numerous items on the ACO with a very aggressive schedule and fines if the schedule was not met. Effort included developing staffing plan with roles and responsibilities for all staff at the City's new water treatment plant, develop extensive SOPs for the operation of the new water treatment plant, development of SOPs for responding to twenty critical SCADA system alarm, install a cover on a water storage tank, develop and provide training for a unidirectional flushing and valve exercising program for the City's water distribution system. ACO schedule was met with all items completed on schedule and to the satisfaction of MADEP.

**Town of Acushnet, MA – Water Supply Development and Distribution System Upgrade.** Client Manager for the New Public Supply Well Development and Water Distribution System upgrade for the Acushnet water system. The new source development of a new wellfield to be constructed in a sand and gravel aquifer included preparing Pumping Test Proposal

for review by DEP performing two separate, single well aquifer parameter pumping tests, and one combined wellfield stabilization pumping test. Project included drilling of 14 2.5-inch observation wells and 14 shallow wellpoints, and five gravel-packed wells. A numerical groundwater flow model was developed to determine the Zone II area of contribution, and to estimate impacts to surface water resources (lake, river, wetlands) due to potential induced infiltration caused by pumping of wellfield.

The distribution system upgrades included approximately 5 miles of new water mains and a water meter radio water read system. This project included the development of a hydraulic model and a unidirectional flushing program for the distribution system.

**City of Fall River, MA – Water Infrastructure Financing/Meter Replacement Program.** Project Manager for this project which included identifying potential funding and revenue sources for municipal water system infrastructure improvements. Fall River was in desperate need of infrastructure improvements to its water system without availability funding. This project included working with Fall River Water Department and its Watuppa Water Board to identify available funding and revenue sources. The State Revolving Fund loan program was identified as the best funding option and lost revenue from the City's old inaccurate large commercial and industrial water meters were identified as potential revenue sources. This project included evaluating all available meters to be considered for the replacement program. Six different meter manufactures were evaluated based on various criteria such as potential increased revenue, meter cost, accuracy, installation requirements, warranty, maintenance requirements, reliability, manufactures service and references. The selected meter for this program was accepted by Fall River. Provided assistance with project bidding, award and meter installation. The revenues generated from the installation of new meters increased revenue to fund over \$20 million of water system infrastructure improvements without increasing water rates to Fall River's customers.

**City of Haverhill, MA – SCADA and Process Evaluation.** Principal in Charge responsible for facilitating process upgrades, improved communications, regulatory approvals, procedure changes, and operator changes necessary to operate Haverhill's water treatment facility unattended during its third shift, while providing a safe, continuous water supply to its customers.

**City of Lowell, MA – Water System Infrastructure Improvements.** Principal in Charge of design and construction oversight of water system improvements under the last two SRF funding rounds. Combined, these projects have been completed for an estimated \$1.5 million under budget. The projects are anticipated to be security related improvements to the treatment plant, improvements to the plant's chemical feed and SCADA systems and modifications to the residuals lagoons as well as construction of two new elevated storage tanks, a pumping station and water main replacement throughout the City. The projects have also included development of a distribution system computer model in a GIS based modeling package. The model was used to develop a water system master plan, capital improvement program and provide design criteria for the various system-wide improvements.

**East Chelmsford Water District, Chelmsford, MA – Treatment Evaluation and Pilot Study.** Project Manager responsible for the evaluation of various technologies for the removal of elevated iron and manganese levels from the District's three water supply wells. The new system will replace the existing undersized greensand filters. The project included obtaining MA DEP approval for the pilot testing and oversight of the piloting of two of the best alternatives as determined by a Preliminary Design Memorandum. A final Pilot Testing Report seeking MA DEP approval to construct a full scale system was also submitted. June, 2004 to present. Engineering fee: \$29,500.

**City of Lowell, MA – Stormwater Separation.** Project Manager for first project in the City of Lowell's program to eliminate Combined Sewer Overflows and wet weather flooding through separation of stormwater from the Lowell combined sewer collection system. Project included incorporating the Lowell Regional Waste Water Utility's consultants design into construction contract documents prepared by Woodard & Curran to replace water mains in the Pawtucketville section of the City for construction contract bidding and award and construction oversight. Project was initiated by Woodard & Curran with the City's Water and Waste Water Utilities to expedite the City's Combined Sewer Separation program in streets where water mains were to be replaced. Project resulted in minimizing the disruption the local residents and a savings in construction costs by replacing water mains, sewers and installing drains in the same construction contract.



Project required coordination with the Lowell Regional Waste Water Utility and their consultants, the Lowell Regional Water Utility, the City of Lowell's Department of Public Works and City Engineers office. The project included installing 2000' of 12", 15", 18" and 24' drains with new catch basins in Laplume Avenue, West Meadow Road and Meadowview Drive, new outfalls to local wetlands and replacement of 500' of 12" sewers in Meadowview Drive.

**City of Lowell, MA – Vulnerability Assessment.** Project Manager for the Vulnerability Assessment for Lowell's water system. Lowell provides water to more than 135,000 people. The project included development of evaluation criteria, identifying critical facilities and assets, determining the likelihood of a threat, analyzing the potential consequences of a threat, determining the level of risk and developing recommendations to reduce risk. Assisted the City in obtaining an EPA grant to complete the Vulnerability Assessment. Project also included revising the water system's Emergency Response Plan to incorporate the findings of the Vulnerability Assessment. Jim is certified by AWWA to complete Vulnerability Assessments utilizing the EPA approved RAM-W methodology.

**City of Fall River, MA – Waterworks Master Plan.** Developed water distribution system model as basis for recommendations for system improvements for Fall River's 250 miles of water mains. Incorporated recommendations into Master Plan, containing historical and projected data through 2020 regarding population, water usage, water supply, fire flow protection, and adequacy of system.

**City of Lowell, MA – Sewer Repair.** Project Manager for design and construction services for the repair of a 84" diameter brick sewer. The sewer is adjacent to the Concord River and required a NOI.

**City of Newburyport, MA – Water Supply Alternatives.** Project Manager for project to evaluate alternatives to supply water and provide fire protection to Plum Island and a project for design and construction services for 13,200 ft of 16-inch diameter water main in Merrimack Street.

**City of Lowell, MA – WTP Upgrade.** Project Manager for the upgrade of this 30 MGD Water Treatment Facility. Responsible for Construction Services including start-up. Upgrade included a chlorine dioxide feed system, flocculator replacement, replacement of sludge collection system, replacement of filter equipment, a SCADA system and upgrades at the facilities raw water Pumping station on the Merrimack River.

**Town of Walpole, MA – H.E. Willis WTP.** Manager for the construction of a new 3 mgd water treatment facility for iron and manganese removal. The project also includes a new 1.5 mgd water storage tank, the replacement of four existing wells and well pumping stations, and four new satellite wells.

**Massachusetts Water Resources Authority (MWRA) – Chestnut Hill Pumping Station.** Assistant Project Manager, responsible for coordination of all technical disciplines, for fast track design of a 90 MGD pumping station to provide an emergency back-up to the MWRA's water tunnel system. This station pumps water from the Chestnut Hill Reservoir. A preliminary design report, hydraulic analysis and plans and specifications for bidding were completed 10 weeks following Notice to Proceed. Project Manager, construction services including resident inspection.

**City of Taunton, MA – Water Pumping Station.** Project Manager for the design of the rehabilitation of Taunton's 7MGD Raw Water Pumping Station on Assawompset Pond. The project includes the replacement of the pumping equipment, installation of a back-up generator and rehabilitation of the building structure.

**City of Taunton, MA – Water Booster Pumping Station.** Project Manager for design and construction services for this 1 MGD pumping station for the East Taunton High Service area. This new Pumping Station is a 1200 square feet masonry block building with a back-up diesel generator.

**Town of Carver, MA – South Meadow Village Water Supply Wells.** Project Manager for design and construction services for the replacement of a tubular well field that required a vacuum priming system. Replaced this unreliable well system with four gravel packed wells and a water storage facility with a back-up generator. Pumping capacity of the new wells is approximately 400 gallons per minute.

**City of Taunton, MA – WTP Evaluation.** Project Manager for project completed in four weeks to address high color levels in the plant's finish water. Jar tests were conducted at the plant to determine the effectiveness of a pre-oxidant and other changes to the treatment process. Potassium permanganate was recommended as a pre-oxidant. Our operations specialists worked with the treatment plant staff to effectively place the pre-oxidant system on line.

**Town of Southborough, MA – MWRA Maintenance Facility.** Project Manager for a multi-building complex containing office space, conference rooms, trade shops, locker rooms, and garages. An HVAC system was designed and installed to meet the needs of each building.

**City of Boston, MA – Hyde Park Pumping Station.** Managed design and construction to rehabilitate this historic 10MGD pumping station. Project elements included HVAC system, replacement of pump motors and electrical system, new doors, windows, roof, office space, locker room, and masonry restoration.

**City of Boston, MA – MWRA Operations Center.** Managed the design and construction to convert an unused garage into an operations center. The existing structure was expanded and renovated to include office space, conference room and an operations control room. A new HVAC, electrical, and plumbing system was installed along with extensive structural and masonry restoration.

**MWRA Water Division – Various Projects.** Managed in-house waterworks design projects and managed a construction oversight group for over \$120 million worth of projects. MDC Structural Design engineer for waterworks infrastructure projects. SRF Funding, Lowell, Fall River, Taunton, and Newburyport, MA. Prepared Project Evaluation Forms for water system improvement projects that received approval from the Massachusetts Department of Environmental Protection in for SFR Funds totaling \$38.3 million.

**City of Lowell, MA – Trotting Park Road.** Project Manager for design and construction services for water and sewer system extension, drainage improvements and roadway reconstruction. Project included 5600 feet of 8-inch diameter water mains and 8-inch diameter sewers, 600 feet of 15-inch diameter drains, 1400 feet of 2-inch diameter force mains, two submersible sewer pumping stations, a water booster pumping station to provide adequate pressure and fire protection and complete roadway reconstruction. Presented the project to the Lowell City Council, the Trotting Park Road residents and the Lowell Conservation Commission.

**City of Newburyport, MA – Market Square Reconstruction.** Project Manager for the reconstruction of Market Square, a pedestrian plaza that is the centerpiece of downtown Newburyport. The project included the reconstruction of the brick plaza, drainage improvements that eliminated chronic flooding of the downtown area during heavy rains, sidewalks and plaza were made handicap accessible. Presented the project at a public meeting and attended biweekly meetings with the local merchants to minimize construction impacts on local businesses.

**City of Chelsea, MA – Prescott Avenue Reconstruction.** Project Manager for the reconstruction of Prescott Avenue. The project included the complete reconstruction of the roadway, improvements to the roadway drainage system and construction of new sidewalks with steep slope transitions from private property to the new street. Project included improvements to the roadway drainage system. Presented a request for a variance to the Massachusetts Architectural Access Board due to the steep slopes of sidewalks. Presented project at a meeting of the Prescott Avenue residents.

**City of Newburyport, MA – Replacement of the Merrimack Street Water Main.** Project Manager for the replacement of 13,200 feet of existing water main with a 16-inch diameter main in Merrimack Street adjacent to the Merrimack River. Project required the reconstruction of more thirty storm drains with outlets in the Merrimack River. Project presentations were made to the Newburyport City Council, Conservation Commission and at public meetings with local residents.

**City of Taunton, MA – Water Main Replacement.** Project Manager for the design and construction of five miles of water mains in the City of Taunton. The water mains were constructed in Burt Street and Mass Highway's Route 44. The project required obtaining a Mass Highway permit and submitting a Notice of intent with the Taunton conservation Commission. The project included replacing a number of drainage culverts and realigning a portion of one of the City streets.

**City of Taunton, MA – Water Storage Tank.** Project Manager for the design and construction a 750,000 gallon water storage tank. Project included identifying and evaluating potential storage tank sites, presented the recommended site to the City Council and to residents who were initially opposed to the project. Obtained consensus with residents to proceed with the construction of the storage tank. Assisted the City with negotiating to obtain the property to locate the storage tank at no cost the City.

**City of Fall River, MA – Replacement of Water Mains.** Project Manager for the design and construction for the replacement of 42,000 feet of 8-inch and 12-inch diameter water mains in 31 congested city streets. The project included an evaluation of the condition of the pavement of all city streets where water mains were replaced and developing a pavement restoration program that included permanent trench patch, milling and overlay or complete reconstruction depending on the condition of the pavement. Handicap ramps were installed at roadway intersections. Water mains had to be replaced on Mass Highway bridges requiring a Mass Highway permit. Assisted Fall River in obtaining SRF funding.

**City of Malden, MA – Water Main Replacement.** Project Manager for the replacement of 1600 feet of 8-inch diameter water mains in Mount Vernon Street and Beachview Place. The project included the replacement of lead services and was funded by the MWRA's Local Pipeline Assistance Program.

**City of Taunton, MA – Water Main Improvements.** Project Manager for the design and construction of 2,300 feet of 20-inch diameter water main in the Gordon Owen Riverway and cleaning and lining of 7,600 feet of 20-inch water main in Dean Street, County Street, and Summer Street. All of the cleaning and lining was in congested city streets with heavy traffic. A portion of the Dean Street water main cleaning and lining was in downtown Taunton.

**City of Fall River, MA – Sewer Revaluation.** Project Manager, evaluated impacts of proposed school construction adjacent to an existing 42-inch brick sewer. Developed criteria for monitoring vibration and settlement due to the adjacent construction. Evaluated options to reinforce the sewer and provide bypass pumping in the event that the sewer was damaged by the school construction.

**Town of Acushnet, MA – Water Main Replacement.**

Project Manager for the design and construction of approximately 9,000 feet of 12 and 8-inch diameter water mains in Hamlin Street, Middle Road, Second Avenue and Pershing Avenue. The project included filing a notice of intent with the local conservation commission, directional drilling of approximately 400 feet of 12-inch main under existing granite culverts and replacing hydrants and services. Assisted the Town in obtaining a grant for 45% of the total project cost from the US Department of Agriculture.

**City of Taunton, MA – Sewer System Extension.** Project Manager for the design of approximately 22,000 of new sewers in the area around Lake Sabbatia Lake in the City of Taunton. The project included three sewer pump stations a DEP sewer extension permit and filing a NOI the conservation commission.

**City of Taunton, MA – Sewer System Evaluation.** Project Manager for a sewer system analysis to determine the impact of a comprehensive permit for a proposed development of 355 residential units. The existing sewer line that was to handle the flow of the proposed development was surcharging during heavy rain events and thought not to have the capacity to handle additional flows. The evaluation identified debris and numerous sags that collected grit restricting the sewer flow causing surcharging.

**City of Quincy, MA – Water Main Repair.** Directed the design and construction of the repair of a leak in a blow-off pipe on an MWRA 24-inch diameter main adjacent to the Neponset River. This water main was the primary supply to the City of Quincy and was repaired without taking the main out of service by utilizing line-stops.

**City of Boston, MA – Water Main Rehabilitation.** Directed planning and design for rehabilitation of the MWRA's 60-inch diameter main in Nonantum Road, an MDC parkway. Project consisted of evaluating rehabilitation options for this section of the watermain which was badly corroded. The repair included sliplining a portion of the existing 60-inch steel water main with a 48-inch diameter ductile iron pipe.



**Cities of Malden and Revere, MA – Water Main Replacement.** Directed the construction for the replacement of approximately 18,900 ft of severely corroded 30-inch water main with 48 and 36-inch diameter pipe. Pipeline was constructed in heavily traveled roads in Malden and Revere. Construction included disposal of contaminated soils encountered, the reconstruction of Eastern Avenue in Malden and sidewalk reconstruction to meet Architectural Access Board requirements. An Architectural Access Board variance was applied for and received.

**City of Revere, MA – Water Mains.** Directed construction of over 20,000 ft of 36, 30 and 20-inch diameter MWRA water mains in Revere. The mains were constructed in MDC's Revere Beach Parkway and local streets with sidewalk replacements. A section was installed in a jacking sleeve under active railroad tracks.

**Town of Winthrop, MA – Water Mains.** Directed construction of 24,000 ft of 24 and 20-inch diameter water mains. Project completion was critical to the Deer Island court-ordered schedule. A portion of construction traversed environmentally-sensitive Belle Isle Marsh and Winthrop beaches.

**Town of Winthrop and City of Revere, MA – Water Main Cleaning And Lining.** Directed the design and construction of 8,000 ft of 16- and 20-inch MWRA water mains in Revere and 7000 feet of 8-inch local water mains in Winthrop.

**City of Taunton, MA – Water System Improvements.** Project Manager for installation of a polypropylene liner and floating cover at the 22 MG Prospect Hill Reservoir, more than 5 miles of water mains, a 1.4 MGD booster pumping station and a one million gallon elevated storage tank.

**City of Malden, MA – Water Main Replacement.** Project Manager for replacement of existing water mains with 1,600 ft of 8- and 12-inch mains including replacement of hydrants, valves, and service piping in congested city streets.

**City of Boston, MA – MWRA Chestnut Hill Pumping Station.** Assistant Project Manager, responsible for coordination of all technical disciplines, for fast track design of a 90 MGD pumping station to provide an emergency back-up to the MWRA's water tunnel system. A preliminary design report, hydraulic analysis and plans and specifications for bidding were completed 10 weeks following Notice to Proceed. Project Manager, construction services including resident inspection.

**Town of Westport, MA – New Water Mains.** Project Manager for design and construction services of three separate construction contracts to install 14,400 ft of 8- and 12-inch diameter water main in the Mass Highway's Route 6 median and local streets. The project included the installation hydrants, curb stops, water meters in businesses and residences along the water main route, the construction of a new culvert under existing railroad tracks and full width paving. The project required a Mass Highway permit and Notice of intent filed with the local conservation commission.

**Massachusetts Water Resources Authority – Water Mains.** Directed design and/or construction of approximately 20 miles of 20- to 72-inch diameter water mains. Construction typically in local and state roadways with some mains constructed through environmentally-sensitive areas and installed under railroads jacking pipe. Projects were located in Boston, Newton, Lynn, Revere, Saugus, Winthrop, Malden, Stoneham, Brookline. Work required coordination with local officials, residents and businesses, conservation commissions and community groups.

**Massachusetts Water Resources Authority – Water Main Rehabilitation.** Directed design and construction of cleaning and lining approximately 5 miles of 8-, 12-, 16-, and 20-inch diameter mains. Portion of a 60-inch main located adjacent to Charles River in Boston was severely corroded. This section was slip lined with 48-inch diameter ductile iron pipe.

**Massachusetts Water Resources Authority – Water Supply Valves And Meters.** Directed planning, design, construction for replacement of distribution system's inoperable mainline valves; replacement of blow-off valves eliminating cross connections to sewers and drains. Directed construction replacing 63 MWRA revenue meters to communities in greater Boston.

**Massachusetts Water Resources Authority – Water Treatment Facilities.** Managed construction of two 300 MGD capacity chemical storage handling and feed facilities at Norumbega Reservoir and Weston Reservoir in Weston. Project

included the construction of a new building for chlorinators, ammoniators, chemical storage, administrative offices and garages.

**Massachusetts Water Resources Authority – Interim Corrosion Control.** Managed the construction of a facility to feed soda ash and carbon dioxide to the MWRA's water to comply with the EPA Lead and Copper Rules by reducing the potential of lead leaching from household plumbing and inhibiting internal pipe corrosion. This project was completed in accordance with a fast track schedule in compliance with the EPA Lead and Copper Rule.