



Milwaukee
Water Works

Safe, Abundant Drinking Water.

**City of Milwaukee
Department of Public Works
Milwaukee Water Works**

Specifications for

Lincoln Avenue Pumping Station

LS-33: Primary Fill Line for Water Storage Tanks



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GENERAL REQUIREMENTS

PART 1 DEPARTMENT OF PUBLIC WORKS – GENERAL SPECIFICATIONS

The Department of Public Works General Specifications applies to all contracts.
 The General Specifications can be found at:
http://www.mpw.net/services/bids_home

PART 2 SPECIFIC OFFICIAL NOTICE AND GENERAL OFFICIAL NOTICE

The Specific Official Notice as it appears in The Daily Reporter and General Official Notice is part of these Contract Documents.

PART 3 SPECIFICATIONS

LS-33: Primary Fill Line for Water Storage Tanks

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LS-33 PRIMARY FILL LINE FOR WATER STORAGE TANKS

JOB REQUIREMENTS

- JR-1 FORM OF BID Contractor shall submit a lump sum bid for furnishing the complete job in accordance with plans and specifications.
- JR-2 JOB LOCATION The pumping station is located at 3641 West Lincoln Avenue, Milwaukee, WI 53215.
- JR-3 GENERAL DESCRIPTION OF WORK The work to be performed under the provisions of this contract and as set forth in these documents consists of the supply and installation of all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of every nature, inspection, and rentals for all work involved and described below.
- JR-4 CONTRACT DRAWINGS The contract drawings upon which the proposal is to be based are listed hereunder:
- | | |
|--------------|--------------------------------|
| LS - 33 - 01 | Location Map and Drawing Index |
| LS - 33 - 02 | Demolition and Piping Plan |
| LS - 33 - 03 | Details |
| LS - 33 - 04 | Structural Modifications Plan |
| LS - 33 - 05 | Electrical Plan |

The contract drawings are general in nature and are intended to indicate the relative locations of materials specified in the areas indicated. Dimensions and elevations indicated on the drawings in reference to existing structures or utilities are the best available data obtainable but are not guaranteed by the City of Milwaukee (City) and the City will not be responsible for their accuracy. Before bidding on any work dependent upon the data involved, the contractor shall field check and verify all dimensions, grades, lines, levels or other conditions of limitations at the site to avoid construction errors.

- JR-5 PRE-BID MEETING A MANDATORY Pre-Bid Meeting for all prospective bidders will be held on Tuesday, August 20, 2013 at 10:00 A.M. at the Howard Avenue Water Purification Plant, 3929 South 6th Street, Milwaukee WI, 53221. The City will ONLY receive bids from prospective bidders who are in attendance at the MANDATORY Pre-Bid Meeting. The official envelope for submitting a bid and bid bond form will be available at the MANDATORY Pre-Bid Meeting. All attendees are required to e-mail anthony.j.supinski@milwaukee.gov and mark.a.gremmer@milwaukee.gov at least 24 hours in advance of the Pre-Bid Meeting to be placed on the Howard's Visitor Daily Gate Log for access to the Howard Avenue Water Purification Plan.

JR-6 SITE VISIT A site visit will be available at the conclusion of the **MANDATORY** Pre-Bid Meeting.

JR-7 PRE-CONSTRUCTION MEETING After the Notice to Proceed is issued, a date shall be set for the pre-construction meeting to be held at the job site. Construction details of the project will be discussed in the meeting.

JR-8 JOB SCHEDULE Within ten (10) days after Notice to Proceed is issued, the contractor shall submit a construction schedule for approval. The schedule shall be made in sufficient detail to indicate dates of each significant operation. The schedule shall be such that the entire job will be completed within the specified completion time. Microsoft Project 2010 shall be used to create the schedule. Submit a Microsoft Project Document file and Adobe Acrobat Document file of the schedule.

The contractor shall place all orders for materials promptly after award of the contract. With submittal of the construction schedule, contractor shall include a schedule of delivery of all major material and equipment required for the job.

The contractor shall immediately notify the City, in writing, of any problems with meeting this schedule. If the construction schedule cannot be met because of materials or equipment deliveries, the contractor shall be required to submit purchase orders and confirmations of delivery, showing the date the order was placed and the promised date of delivery.

JR-9 WORK DAYS AND TIMES Work shall take place between the hours of 7:00 AM to 3:30 PM. Work shall not be allowed on Saturday, Sunday or City holidays.

JR-10 START AND COMPLETION DATE Work on this project shall be complete by Friday, January 31, 2014.

JR-11 CHARGE FOR INSPECTION The contractor will be charged \$350.00 per day, per inspector, for each and every day inspection is required on this contract after the date allowed for completion or after such extension of time as may have been granted. This charge is further defined in Section 2.5.11 of the Department of Public Works (DPW) General Specifications.

JR-12 PROGRESS PAYMENTS Within ten (10) days after the Notice to Proceed is issued, the contractor shall submit to the City for approval a schedule showing the breakdown of the contract with quantities and prices as a basis for checking and computing progress estimates. The values shown in the approved breakdown shall be used for pay purposes only and shall not be used as a basis for additions to or deductions from contract work.

When the contractor proceeds properly and with diligence to perform and complete the work on this contract, the Commissioner of Public Works (Commissioner) may, from time to time as the work progresses, grant to the contractor an estimate of the amount already earned.

In making such progress estimates, there shall be retained 5% of each progress estimate until final completion and acceptance of the work; except that after 50% of the work has been completed and the Commissioner finds that satisfactory progress is being made and all conditions complied with, he may authorize any of the remaining progress payments to be paid in full to the contractor. Progress payments are further defined in Section 2.9.14 of the DPW General Specifications.

In accordance with Charter Ordinance 7.26 as amended June 1, 1972, payment for materials delivered to the work or storage site may be authorized by the Commissioner providing the following terms and conditions are met:

- A. The work is progressing properly and such materials as specified are properly stored and suitable for permanent incorporation in the work.
- B. Materials designated for pay in the next progress estimate after delivery shall be limited to fabricated or manufactured components which are assembled in final form ready for placement in the work
- C. The following forms shall be submitted with requests for payment.
 - 1. Progress Estimate and Request for Payment for Fabricated Materials or Components Properly Stored.
 - 2. Certification of the contractor or his duly authorized representative.

Field Engineer shall verify that material is as specified and properly stored.

- D. The contractor shall be responsible for the safeguarding of any such materials against loss or damage whatsoever, and in the case of any loss or damage, the contractor shall replace such lost or damaged materials at no cost to the City. The Commissioner shall reserve the right to deduct from ensuing progress estimates the value of any lost or damaged materials until such loss or damage is restored by the contractor.
- E. The Commissioner may limit processing progress estimates to those cases where the amount earned in any pay period for work and materials is \$5,000 or more.
- F. Any materials for which payment has been made shall not be removed from the work or storage site without the specific written approval of the Commissioner.

JR-13 FORMAL CORRESPONDENCE Formal correspondence shall be addressed to:
Carrie M. Lewis, Superintendent, Milwaukee Water Works, Zeidler Municipal Building,
841 North Broadway, Room 409, Milwaukee, WI 53202.

Formal correspondence shall include:

1. Request for Change Order.
2. Request for extension of Completion Date
3. Disputes concerning Payment or Field Issues.
4. Payment Requests.
5. Submittals.

END OF SECTION

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Contract description
2. Contractor use of site and premises
3. Work by City
4. Protection of work and property
5. Specifications and standards
6. Shop drawings
7. Warranty and guarantee

1.02 CONTRACT DESCRIPTION

- A.** This contract includes the furnishing of all equipment, labor, supervision, materials and appurtenances for and in connection with the demolition of existing system and supply and installation of a system to fill water storage tanks as shown on the contract drawings and further specified herein.
- B.** The work to be performed shall include but not be limited to the following:
1. Demolition of valves, fittings, supports and piping in Fill Piping.
 2. Demolition of accumulator, pipe, fittings and concrete buttresses in Furnace Room.
 3. Supply and installation of electronic control valve, fittings, associated piping, drain valves, sample lines, supports, controls and sensors. If pipe flange from water main in the street and pipe flange from water storage tanks are out of alignment with each other, provide a fitting to allow them to be connected without placing excessive stresses on the connecting pipe and fittings.

4. Refurbish and reinstallation of existing 24-inch isolation valve.
5. All required electrical work for the electronic control valve.
6. Enlarge opening in Mechanical Room wall and provide structural support as shown in Contract Drawings.
7. Patch openings in floor where concrete buttresses were removed.

1.03 CONTRACTOR USE OF SITE AND PREMISES

- A. Unless noted otherwise, equipment that is on site shall not be taken out of service during the work of this project.
- B. If necessary, the contractor may disconnect power to Pump #1's motor for a period of five (5) consecutive days.
- C. If necessary, the contractor may partially disassemble the stairway and balcony. Portions of the stairway and balcony that were disassembled shall be reassembled.
- D. When the City isolates section of fill pipe to be worked on from the storage tanks and water main, the contractor will have eight (8) hours to provide a blind flange on the pipe flanges in the Furnace Room before the storage tank and water main are placed back into service.
- E. The premises are unoccupied, but the City will continue to conduct normal operations of the pumps and secondary fill valve from a remote location.
- F. Cooperate with City to minimize conflict and to facilitate City operations.

1.04 WORK BY CITY

- A. City will be responsible for isolating section of fill pipe to be worked on from storage tanks and water main. Valves may not seal 100% and a stream of water may be present while the blind flanges are installed. City will ensure stream of water will be small enough to permit installation of blind flanges.
- B. City will isolate section of pipe to be worked on for a period of eight (8) hours. Contractor shall perform demolition between pipe flanges and install blind flanges as shown on Contract Drawings.
- C. City will be responsible for opening and closing roof hatch if contractor prefers to bring lower equipment through hatch.

1.05 PROTECTION OF WORK AND PROPERTY

- A. Any areas of the building or grounds which have become damaged in any way shall be repaired or replaced by the contractor prior to the final inspections. The method of repair used must be acceptable to the City.

1.06 SPECIFICATIONS AND STANDARDS

- A. Materials, general design, design loads, allowable stresses, joint design, shop fabrication and field construction shall conform to the requirements of the following latest standard specifications of any technical society, organization, or association, or to codes of local or state authorities:
 - 1. NEC, National Electric Code.
 - 2. AWWA, American Water Works Association.
 - 3. IEEE, Institute of Electrical and Electronic Engineers.
 - 4. ANSI, American National Standards Institute.
 - 5. SSPC, Society for Protective Coatings.
 - 6. ASTM, American Society for Testing and Material.
 - 7. Wisconsin Administrative Code.
 - 8. OSHA, U.S. Department of Labor Occupational Safety and Health Act.
 - 9. EPA, United States Environmental Protection Agency.
- B. The contractor shall be familiar with the requirements of the above agencies. Any conflict in the contract drawings, these specifications, the contractor's design or construction methods shall result in this contractor performing in a manner which conforms to the applicable requirements. Agencies and/or associations not specified above are referenced in individual specification sections as required.

1.07 SHOP DRAWINGS

- A. Within three (3) weeks after Notice to Proceed is issued, the contractor shall submit to the City for approval a minimum of three (3) copies of all shop, fabrication, assembly, and other drawings required by the specifications; all drawings of equipment and devices offered by the contractor; all drawings showing essential details of any change in design or construction proposed by the contractor; and all necessary wiring, piping and appurtenance layouts. Drawings of equipment and devices shall show sufficient detail to adequately depict the construction and operation of each item.

- B. Each shop drawing shall bear City of Milwaukee, the name and location of the structure, job number, the name of contractor, the date of the drawing, the date of each correction or revision and the specification numbers and plan sheet numbers applicable thereto.
- C. Three (3) revised copies of each drawing shall be submitted each time a drawing is returned to the contractor for revision. The final approval of a drawing shall be included in the operation and maintenance manuals.
- D. After approval by the City, all such drawings shall become a part of the contract documents and the work or equipment shown thereby shall be furnished and installed as shown unless otherwise required by the City. No work shall be performed or equipment manufactured until drawings have been approved. The approval of drawings submitted by the contractor will be for, and will cover only general conformity to the plans and specifications and will not constitute a blanket approval of all dimensions, quantities, or details of the material or equipment shown by such drawings, nor shall such approval relieve the contractor of responsibility for errors contained therein.
- E. At the completion of work and prior to final payment, the contractor shall provide the City with three (3) sets of "as-built" drawings for the completed job showing all new and modified appurtenances. All conduit or similar items shall be located by dimensions and elevations. The contractor will be responsible for the accuracy of these drawings.

1.08 WARRANTY AND GUARANTEE

- A. The contractor shall furnish a written one (1) year warranty from the date of official acceptance against defective materials or workmanship before the final payment is made.
- B. During the period of one (1) year from and after the date of official acceptance by the City of the work embraced by this contract, the contractor shall make all needed repairs arising out of defective workmanship or materials, or both, which in the judgment of the Commissioner, shall become necessary during such period.
- C. Whenever defective equipment or materials are replaced, the warranty period for the replacement equipment or materials shall be the remaining warranty period for the original, replaced equipment or materials.

- D. If within ten (10) days after mailing of a notice in writing to the contractor, or his agent, the said contractor shall neglect to make, or undertake with due diligence to make, the aforesaid repairs, the City is hereby authorized to make such repair at the contractor's expense; providing, however, that in case of an emergency where, in the judgment of the Commissioner, delay would cause serious loss or damage, repairs may be made without notice being sent to the contractor, and the contractor shall pay the cost thereof.

- E. The contractor shall also furnish written guarantees as required by each section. Length of time and requirements of guarantees are specified in each section. Each guarantee shall commence on the date of official acceptance. Final payment will not be paid until the City receives all guarantees.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01039
COORDINATION AND MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Coordination
- B. Alterations
- C. Cutting and Patching
- D. Pre-Construction Meeting
- E. Pre-Installation Meetings
- F. Progress Meetings

1.02 COORDINATION

- A. Coordinate scheduling, submittals, and work on the various sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify that the City requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.
- C. Coordinate space requirements and installation of appurtenance, mechanical and electrical work. Follow routing shown for pipes, and conduit, as closely as practicable; place runs parallel with line of structure. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Coordinate completion and clean-up of work of separate sections in preparation for substantial completion.
- E. Coordinate correction of defective work and work not in accordance with contract documents, to minimize disruption of the City's activities.

1.03 ALTERATIONS

- A. Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- C. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition.
- D. Refinish visible existing surfaces to original condition.
- E. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work to match existing adjacent work in texture and appearance.
- F. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to the City.
- G. Patch or replace portions of existing surfaces that are damaged, lifted or discolored, or showing other imperfections.
- H. Finish surfaces as specified in individual product sections.

1.04 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements which affects:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture resistant element.
 - 3. Efficiency, maintenance or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of City or separate contractor.
- C. Execute cutting, fitting and patching to complete work, and to:
 - 1. Fit the several parts together, to integrate with other work.
 - 2. Uncover work to install or correct ill-timed work.

3. Remove and replace defective and non-conforming work.
4. Remove samples of installed work for testing.
5. Provide openings in elements of work for penetrations of mechanical and electrical work.
6. Execute work by methods which will avoid damage to other work, and provide proper surfaces to receive patching and finishing.
7. Cut rigid materials using masonry saw or core drill.
8. Restore work with new products in accordance with requirements of contract documents.
9. Fit work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
10. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
11. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
12. Identify and hazardous substance or condition exposed during the work to the City.

1.05 PRECONSTRUCTION MEETING

- A. The City will schedule a pre-construction conference after Notice of Award.
- B. Attendance Required: City and contractor.
- C. Agenda:
 1. Submission of executed bonds and insurance certificates (unless previously submitted to DPW).
 2. Submission of list of subcontractor, list of products, Schedule of Values, and progress schedule.
 3. Designation of personnel representing the parties in contract.
 4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, change orders and contract closeout procedures.
 5. Scheduling and reports.

6. Use of premises by City and contractor.
7. Construction facilities and controls provided by City.
8. Temporary utilities and controls provided by City, if any.
9. Security and housekeeping procedures.
10. Procedures for testing.
11. Procedures for start-up of equipment.
12. Requirements for maintaining record documents.
13. Inspection and acceptance of equipment put into service during construction period.
14. Conflicts.
15. A review of contract documents shall be made and deviations or differences shall be resolved.
16. Establish which areas on-site will be available for use as storage areas and working area.

1.06 PRE-INSTALLATION MEETING

- A. When determined by the City, convene a pre-installation meeting at work site prior to commencing work.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify all parties four (4) days in advance of meeting date.
- D. The Milwaukee Water Work's representative will prepare agenda, preside at meetings, record minutes, and distribute copies within three (3) days after the meeting to participants.
- E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

1.07 PROGRESS MEETING

- A. The City will schedule and administer meetings throughout progress of the work as required.

- B. The City will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within three (3) days to the City, participants, and those affected by decisions made.
- C. Attendance Required: Contractor's general superintendent, major subcontractors and suppliers, City, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meeting.
 - 2. Review of work.
 - 3. Field observations, problems and decisions.
 - 4. Field observations of problems that impede planned progress.
 - 5. Review submittal schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards of proposed changes on progress schedule and coordination.
 - 12. Other business relating to work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01500
JOB SITE SECURITY, UTILITES AND FACILITIES

PART 1 SCOPE

1.01 INDEX

- A. Scope
- B. Security and Safety
- C. City of Milwaukee Permits
- D. Occupancy during construction
- E. Electric Power
- F. Water
- G. Toilet Facilities
- H. Deliveries

1.02 GENERAL CONDITIONS

- A. All operations shall be carried on with a minimum of damage and disturbance. All damages shall be repaired to the original condition to the satisfaction of the engineering representative.
- B. All removals become the property of the contractor and shall be disposed of off the site unless otherwise specified.

1.03 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.04 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Protect non-owned vehicular traffic stored materials, site and structures from damage.

1.05 PROGRESS CLEANING

- A. Waste materials, debris, and rubbish shall be removed daily after work. Maintain site in a clean and orderly condition.
- B. Clean and repair damage caused by removals or installations.
- C. Restore existing facilities used during construction to original condition.

PART 2 SECURITY AND SAFETY

2.01 GENERAL

- A. The Milwaukee Water Works (MWW) consists of a number of facilities to treat and deliver drinking water to the City and surrounding suburban communities. To insure the safety and security of drinking water, the MWW has instituted protocols for visitors and contractors to control entry to these facilities. It is essential that contractors strictly comply with the security policy outlined in the specification section.
- B. For this project, the contractor shall continuously coordinate building and site security measures, including accessing the site, with the designated Water Engineering Representative or the Water Security Manager; telephone (414) 286-3465.

2.02 SCOPE

- A. Any and all City agencies and contractors engaged for work at MWW facilities shall be required to attend the Pre-Construction Meeting before any contracted work can be initiated. At this meeting, the contractor and subcontractors shall have a detailed briefing with discussions regarding the following items:
 - 1. MWW site security policies and procedures.
 - 2. Contractor and subcontractor obligations.
 - 3. Notifying City prior to commencing work that may impact MWW operations.

2.03 POLICIES

- A. At the Pre-Construction Meeting, MWW staff shall provide the prime contractor with site policies to be reviewed by the prime and subcontractors.

These documents may include:

1. Lock-out/Tag-out Policy
2. Confined Space Entry Procedures
3. Evacuation Procedure for Propane, Lox, and Ammonia Releases
4. Personal Protective Equipment Guidelines
5. No Smoking Policy
6. Prohibited Materials

B. Additionally, the contractor will be provided:

1. Contact phone numbers for MWW staff.
2. On-site parking location and designated construction entrance.
3. Site security policy and procedures.

C. The prime contractor shall be required to review these documents and is responsible for conveying the contents of these submittals to their employees, subcontractors, and any other parties working directly or indirectly for them. These policies apply equally to all contractors. Failure to comply with established policies and procedures may result in access privileges being withdrawn.

D. MWW staff shall provide a “walk-through” session with the contractor to review area layout and site plans as part of this orientation process and to establish the specific work areas necessary for the contractors to perform their scope of work. Topics covered in this session include: site overview with hazards, material safety data sheets, fire extinguisher placement, and the storm water protection policy.

2.04 CONTRACTOR RESPONSIBILITIES

A. Contractors shall provide the following documents no less than seven (7) days prior to the start of contracted work. Documents shall be sent to the Water Security Manager, (414) 286-3465:

1. Scope of work to be performed;
2. Name of primary contractor’s onsite representative;
3. Names of all companies subcontracted to do work on the project;
4. Completed “Contract Firm Registration Form” (see attachment A) for prime contract firm and every subcontract firm;

5. A “Contractor Employee Registration Form” completed for the contractors and every employee who needs to be granted site access (see Attachment B);
 6. List of items to be stored on-site;
 7. Material Safety Data Sheets for all chemicals to be used/stored on-site.
- B. It is the responsibility of the primary contractor to facilitate gathering the “Contractor Employee Registration Form” for all subcontractors working on the project. A subcontractor is defined as an individual or firm hired by the primary contractor to perform a specific task as part of the overall project. This would not include an organization making deliveries of supplies or equipment to the job site; procedures for these firms are covered under Part 8, “DELIVERIES”.
- C. In the event it is necessary for the prime contractor to add additional employees to the list of approved personnel, a minimum of 72 hours, or three (3) business days, must be allowed for processing of the request. Site access will be denied to the additional personnel until processing is complete.
- D. Contract firms are obligated to notify the Water Security Manager, (414) 286-3465, in a timely manner of any site-authorized staff that leaves the employ of the contractor.
- E. Only the primary contractor should be contacting the Water Security Manager with issues or access requests. If a request for site access does not come from the primary contractor, the request will not be processed.
- F. During the time period that the contractor is on site, they must agree to:
1. Notify the plant manager immediately of any significant chemical spills or leaks;
 2. Maintain normal, non-toxic breathable air quality, through adequate ventilation at their work site;
 3. Perform no equipment isolations or tie-ins without the signed approval of MWW;
 4. Restrict movement to the specific work areas within the site to perform contractor’s scope of work.

2.05 CONTRACTOR NOTIFICATION OF CITY

- A. Contractors must notify Engineering/Site Management staff of any welding, torching, or potentially hazardous or operational impact request, prior to commencing such operations.

- B. Failure to comply with the terms of the provisions that provide for MWW employee safety shall be cause for the contractor to discontinue activities at the site.

2.06 CONTRACTOR IDENTIFICATION AND DAILY REGISTRATION

- A. Every day, all contractors shall be required to show a valid ID card, to sign in at the start of work, and sign out at the end of work. A MWW employee or designated security representative shall be on site to ensure compliance. Any identification tags or lanyards issued by MWW are to be worn while on site and returned to site management upon completion of contracted work.

2.07 CONTRACTOR GATE ACCESS AND PARKING

- A. Contractors must comply with the terms of entry for the site and park only in the areas designated for parking by the MWW site representative.
- B. Parking privileges may be rescinded at any time as site operational requirements dictate.

PART 3 CITY OF MILWAUKEE PERMITS

- 3.01 A. See Chapter 2.3.0 – Necessary Notices and Permits of the DPW General Specifications for further information and requirements.

PART 4 OCCUPANCY DURING CONSTRUCTION

- 4.01 A. During the contractor's performance of the work, the City will continue to occupy the existing building. The contractor shall take precautions to prevent the spread of dust and debris, particularly where such material may sift into the building. The contractor shall provide labor and materials to construct, maintain and remove necessary temporary enclosures to prevent dust or debris in the construction area(s) from entering the building.

PART 5 ELECTRICAL POWER

- 5.01 A. Limited electrical power for construction purposes is available at the site and will be made available to the contractor. The contractor will be allowed to use the receptacles that are located outdoors around the exterior of the building. The contractor's equipment shall not exceed the capabilities of these receptacles. The contractor shall provide additional electrical power if their equipment exceeds the capabilities of the receptacles.
- 5.02 A. Contractor shall provide and maintain all necessary power cords, electrical lighting, heat and ventilation, and shall make all necessary connections in accordance with OSHA regulations.

PART 6 WATER

- 6.01 Water for construction purposes is available at the site and will be made available to the contractor.
- 6.02 Contractor shall provide all hoses, back flow preventer, valves and connections for water from source designated by the City.

PART 7 TOILET FACILITIES

- 7.01 A. Contractor shall furnish portable facilities. Contractor shall maintain these toilet facilities in a sanitary condition throughout the duration of the project and shall remove them from site at the end of the project. The placement and location of the temporary portable toilets shall be coordinated with the plant manager and Water Engineering Representative.

PART 8 DELIVERIES

- 8.01 A. Contractor shall coordinate the delivery of all equipment, material, dumpsters, portable toilets and other required items required for the contract work with the MWW staff. A minimum of twenty-four (24) hours prior notice in advance of the desired delivery date shall be transmitted to the designated Water Engineering Representative. Contractor shall provide the following information in the notification:
1. Trucking/Delivery Company
 2. Driver Name
 3. Truck License Plate Number
- 8.02 A. The driver of the delivery vehicle is required to display picture identification as a prerequisite for entry to the MWW facility for the delivery. Failure to comply with the above will result in denial of project site access, requiring the contractor to reschedule delivery.

END OF SECTION

Milwaukee Water Works

Safe, Abundant Drinking Water.

LS-33
Attachment "A"

FORM A

CONTRACT FIRM REGISTRATION FORM

CONTRACTOR: _____

PLANT/SITE: _____

CONTRACT/SERVICE ORDER NO. _____

WATER ENGINEERING PROJECT NO. _____

PRIMARY CONTACT PERSON: _____

OFFICE PHONE NUMBER: _____

CELL PHONE NUMBER: _____

REQUESTED WORK HOURS (00am – 00pm): _____

NUMBER OF EMPLOYEES TO BE WORKING ON-SITE: _____

**Signature certifies receipt of the materials outlined in Contract Section 01500,
Part 2 – Security and Safety, Section C, Policies.**

SIGNATURE: _____

PRIMARY CONTACT PERSON

DATE: _____

***Accompanying this form should be a complete listing of all
equipment to be stored on site for the duration of the project.***

Milwaukee Water Works

Safe, Abundant Drinking Water.

LS-33
Attachment "B"

FORM B

CONTRACTOR EMPLOYEE REGISTRATION FORM

Contract Firm: _____

Plant/Site/Project: _____

Employee Name (Printed): _____

This certifies that I have received the building site security and safety policies.

EMPLOYEE
SIGNATURE: _____
Required

DATE: _____

ONSITE PARKING

- I will always be driving a Company vehicle.
- I will always be a passenger in a vehicle.
- I will be driving my personal vehicle. (If checked, complete and sign the next section.)

Contractor Personal Vehicle Liability Waiver

EMPLOYEE VEHICLE
MAKE & MODEL: _____ LICENSE PLATE: _____

I, hereby agree to hold harmless the City of Milwaukee for any and all damage, loss or injury, which may occur as a result of utilizing the contractor onsite parking area.

EMPLOYEE
SIGNATURE: _____
Required

DATE: _____

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Products
 - 2. Transportation and handling
 - 3. Storage and protection
 - 4. Product options
 - 5. Substitutions

1.02 PRODUCTS

- A. Material, machinery, components, equipment, fixtures and system shall be new. Assure standardization and uniformity by using products from one manufacturer.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the contract documents.
- C. Provide interchangeable components of the same manufacture for components being replaced.

1.03 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

1.04 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions.
- B. Store with seals and labels intact and legible.

- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
- J. Rolled Roofing Materials: All rolled roofing materials must be stored standing on end on a pallet or otherwise raised off of the roof. The materials are to be covered in a proper manner to assure that they will not become wet prior to application. Any materials that become wet or damaged must be removed from the job-site and replaced at the contractor's expense.
- K. The contractor is responsible for protecting all materials from the elements. If any material, such as insulation, becomes wet, it cannot be installed and must be replaced at the contractor's expense.

NOTE: Insulation and rolled roofing materials must be covered with waterproof tarps at the end of each workday. Plastic wrappers supplied by the insulation manufacturer are not acceptable substitutes for tarps. The City's representative will reject any covering method or material, which does not adequately protect roofing materials.

1.05 PRODUCT OPTIONS

- A. Products specified by reference standards or by description only: Any product meeting those standards or description.
- B. Products specified by naming one or more manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

- C. Products specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.06 SUBSTITUTIONS

- A. City will consider requests for substitutions only within fifteen (15) days after date established in Notice to Proceed unless otherwise specified in individual specification sections.
- B. Substitutions may be considered when a product becomes unavailable through no fault of the contractor.
- C. Document each request with complete data substantiating compliance of proposed substitution with contract documents.
- D. A request constitutes a representation that the contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other work that may be required for the work to be complete with no additional cost to City.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 5. Will reimburse City for review or redesign services associated with reapproval by authorities.
 - 6. Has reviewed, taken into account, and will abide by all substituted material manufacturers installation instructions regarding coverage rates or any other application/installation differences between those being submitted for substitution and those specified.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the contract documents.
- F. Substitution Submittal Procedure:
 - 1. Submit two (2) copies of request for substitution for consideration. Limit each request to one (1) proposed substitution.

2. Submit shop drawings, product data and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The City will notify contractor in writing of decision to accept or reject request.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01650
STARTING OF SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Starting systems
2. Demonstrations and instructions

B. Related Sections

1. Section 01700 – Contract Closeout

1.02 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify City seven (7) days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Provide expendables required for initial start-up of equipment unless otherwise specified.
- G. Execute start-up under supervision of responsible manufacturer's representative in accordance with manufacturers' instructions.
- H. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- I. Submit a written report stating that equipment or system has been properly installed and is functioning correctly.

1.03 DEMONSTRATIONS AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to City's personnel on mutually agreeable dates prior to date of initial placement in service and final payment.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six (6) months.
- C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with City's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate start-up, operation, control, adjustment, trouble shooting, servicing, maintenance and shutdown of each item of equipment at agreed time and location.
- E. Prepare and insert additional data in operation and maintenance manuals when need for additional data becomes apparent during instruction.
- F. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Closeout Procedures
 - 2. Final Cleaning
 - 3. Project Record Documents
 - 4. Operation and Maintenance Data
 - 5. Spare Parts and Maintenance Products
 - 6. Guarantee
- B. Related Sections
 - 1. Section 01500 – Job Site Security, Utilities and Facilities: Progress Cleaning

1.02 CLOSEOUT PROCEDURES

- A. Submit written certification that contract documents have been reviewed, work has been inspected, and that work is complete in accordance with contract documents and ready for City's review.
- B. Provide submittals to City that is required by governing or other authorities.
- C. Submit final application for payment identifying total adjusted contract sum, previous payments and sum remaining due.

1.03 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. The contractor shall remove bitumen or adhesive from walls, windows, floors, ladders and finished surfaces.

- C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- D. Clean debris from roofs, gutters, downspouts and drainage systems.
- E. Clean site; sweep paved areas, broom clean building, rake clean landscaped surfaces.
- F. Remove waste and surplus materials, rubbish and construction facilities from the site.

1.04 PROJECT RECORD DOCUMENTS

- A. Maintain on site one (1) set of the following record documents; record actual revisions to the work:
 - 1. Contract Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Change Orders
 - 5. Reviewed Shop Drawings, Product Data, and Samples
 - 6. Manufacturer's instructions for assembly, installation and adjusting
- B. Ensure entries are complete and accurate, enabling future reference by City.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Field changes of dimension and detail
 - 2. Details not on original drawings
- F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number
 - 2. Product substitutions or alternates utilized

3. Changes made by addenda or change orders
- G. Submit documents to City in the following manner:
1. Submit prior to final application for payment
 2. Documents shall be accompanied with a transmittal letter that includes the following:
 - a) Date
 - b) City's project title and number
 - c) Contractor's name and address
 - d) Title and number of each record document
 - e) Certification that each document as submitted is complete and accurate
 - f) Contractor's signature or authorized representative
 3. Delete consultant and City's title block from documents. Delete engineer's seals from documents.
 4. Submit two (2) sets of documents.
 5. Submit one (1) set of reproducible "mylar" contract drawings.

1.05 OPERATION AND MAINTENANCE DATA

- A. Submit data bound in 8-1/2" x 11" text pages, in three D-side ring binders with durable plastic covers. Drawings and diagrams shall be reduced to 8-1/2" x 11" or 11" x 17". Where reduction is not practicable, large drawings shall be folded separately and placed in an envelope that is bound into the manuals. Envelope shall bear suitable outside identification.
- B. Prepare binder cover and spine with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, project number and subject matter of binder when multiple binders are required.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a table of contents for each volume, with each product or system description identified, typed on 24-pound white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, telephone numbers and e-mails of architect/engineer, contractor, subcontractors and major equipment suppliers.
 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, telephone numbers and e-mails of subcontractors and suppliers. Identify the following:
 - a) Significant design criteria
 - b) List of Materials
 - c) Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents
 3. Part 3: Project documents and certificates, including the following:
 - a) Shop drawings and product data
 - b) Asbestos "Disposal Manifest"
 - c) Certificates
 - d) Photocopies of warranties
- E. Submit one (1) draft copy of volumes fifteen (15) days prior to final inspection. This copy will be reviewed and returned with City comments. Revise content of all document sets as required prior to final submission.
- F. Submit three (3) sets of revised final volumes within ten (10) days after receipt of City's comments.

1.06 WARRANTY AND GUARANTEE

- A. Provide duplicate notarized copies.
- B. Execute and assemble transferable warranty documents from subcontractors, suppliers and manufacturers.
- C. Provide table of contents and assemble in binder with durable plastic cover.
- D. Submit prior to final application for payment.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02519
DISINFECTION OF WATER SYSTEMS

PART 1 - GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Water Works Association (AWWA):
 - a. B300, Hypochlorites.
 - b. C651, Disinfecting Water Mains.
 - c. C653, Disinfection of Water Treatment Plants.
 2. Standard Methods for the Examination of Water and Wastewater, as published by American Public Health Association, American Water Works Association, and the Water Environment Federation.

PART 2 – SUBMITTALS

2.01 SUBMITTALS

- A. Information submittals:
1. Plan describing and illustrating conformance to appropriate AWWA standards and this specification.
 2. Procedure and plan for cleaning and flushing system.
 3. Procedures and plans for disinfection and testing.
 4. Proposed locations within system where samples will be taken.
 5. Type of disinfecting solution and method of preparation.
 6. Method of disposal for highly chlorinated disinfecting water.

PART 3 - PRODUCTS

3.01 WATER FOR DISINFECTION

- A. Clean, uncontaminated, and potable.

- B. City will supply potable quality water. Contractor shall convey in disinfected pipelines or containers.

3.02 CONTRACTOR'S EQUIPMENT

- A. Furnish chemicals and equipment, such as pumps and hoses, to accomplish disinfection.

PART 4 - EXECUTION

4.01 GENERAL

- A. Disinfection procedures shall conform to AWWA C651 and AWWA C653 except as modified in these Specifications.
- B. Disinfect the following items installed or modified under this Project, intended to hold, transport, or otherwise contact potable water:
 - 1. Control valve.
 - 2. Pipelines: Disinfect new pipelines that connect to existing pipelines up to point of connection.
 - 3. Disinfect surfaces of materials that will contact finished water, both during and following construction, using one of the methods described in AWWA C652 and C653. Disinfect prior to contact with finished water. Take care to avoid recontamination following disinfection.
- C. Prior to application of disinfectants, clean pipelines of loose and suspended material. Flush pipelines until clear of suspended solids and color. Use water suitable for flushing and disinfecting.
- D. Allow freshwater and disinfectant solution to flow into pipe or vessel at a measured rate so that chlorine-water solution is at specified strength. Do not place concentrated commercial disinfectant in pipeline or other facilities to be disinfected before it is filled with water.

4.02 SEQUENCING AND SCHEDULING

- A. Commence disinfection after completion of following:
 - 1. Hydrostatic and pneumatic testing, pressure testing, functional and performance testing and acceptance of pipelines, pumping systems, structures, and equipment.
 - 2. Disinfection of:
 - a. Control valve and associated system piping.

4.03 PIPING

- A. Flushing: Before disinfecting, flush all foreign matter from pipe in accordance with AWWA C651. Provide hoses, temporary pipes, ditches, and other conduits as needed to dispose of flushing water without damage to adjacent properties.
- B. Disinfecting Solutions: Minimum free chlorine concentration of 100 ppm.
- C. Application:
 - 1. Inject disinfecting solution into control valve and associated piping and circulate for a minimum three (3)-hour period of time. At end of three (3)-hour period, solution shall have strength of at least 50 ppm free chlorine.
 - 2. Operate small valves on piping and control valve during disinfection to ensure that disinfecting solution is dispersed into all parts of piping and tubing.
 - 3. If disinfecting solution contained in piping and control valve has a residual free chlorine concentration less than 50 ppm after the three (3)-hour retention period, reclean piping and control valve, reapply disinfecting solution, and retest until a satisfactory test result is obtained.
 - 4. After chlorination, flush water from piping and control valve until water through the unit is chemically and bacteriologically equal to permanent source of supply.

4.04 DISPOSAL OF HEAVILY CHLORINATED WATER

- A. In accordance with all local, state, and federal regulations.
- B. Do not allow flow into a waterway without neutralizing disinfectant residual.
- C. See the appendix of AWWA C653 for acceptable neutralization methods.

4.05 TESTING

- A. Collection of Samples:
 - 1. Coordinate activities to allow samples to be taken in accordance with this specification.
 - 2. Provide valves at sampling points.

3. Provide access to sampling points.
- B. Test Equipment:
1. Clean containers and equipment used in sampling and make sure they are free of contamination.
 2. Obtain sampling bottles with instructions for handling from City's laboratory.
- C. Chlorine Concentration Sampling and Analysis: Collect and analyze samples in accordance with AWWA C653.
- D. After control valve, and pipelines have been cleaned, disinfected, and refilled with potable water, City will take water samples and have them analyzed for conformance to bacterial limitations for public drinking water supplies.
1. A minimum of two (2) samples on each of two (2) consecutive days from every major pipeline will be obtained and analyzed by standard procedures outlined by state and local regulatory agencies.
 2. Sampling points will be representative as accepted by the City.

END OF SECTION

SECTION 15060
PIPES AND PIPE FITTINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Materials
 - 2. Finish
- B. Related Sections
 - 1. Section 15110 – Electronic Control Valve

1.02 REFERENCES

- A. The following documents refer to the latest edition.
- B. AWWA Standard C200 Steel Water Pipe.
- C. AWWA Standard C207 Steel Pipe Flanges for Waterworks Service.
- D. ASTM A53/A53M Standard Specifications for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- E. ASTM A234/A234M Standard Specifications for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
- F. ASTM A307 Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- G. ASTM A563 Standard Specification for Carbons and Allow Steel Nuts.
- H. ASME/ANSI B16.9 Factory-Made Wrought Steel Butt-welding Fittings.
- I. ANSI B18.2.1 Square and Hex Bolts and Screws.
- J. SSPC Standard; The Society for Protective Coatings.
- K. NSF/ANSI 61 Drinking Water System Components.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01010 – Summary of Work
- B. Product Data:
 - 1. Submit manufacturer's descriptive literature and product specifications for each product.

2. Submit standard color chart for pipe coating.
 - C. Shop Drawings:
 1. Indicate typical layout including dimensions.
 2. Submit drawings showing field measured dimensions.
- 1.04 PROJECT RECORD DOCUMENTS
- A. Submit under provisions of Section 01700 – Contract Closeout.
 - B. Record information requested in Section 01700 – Contract Closeout.
- 1.05 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this Section with minimum five (5) years' experience.
 - B. Fabricator Qualifications: Company specializing in fabricating work specified in this section with minimum five (5) years' experience.
 - C. Installer Qualifications: Acceptable to manufacturer with experience on at least five (5) projects of similar nature in past five (5) years.
- 1.06 DELIVERY, STORAGE AND HANDLING
- A. Comply with requirements of Section 01600 – Material and Equipment.
- 1.07 GUARANTEE
- A. Comply with provisions of Section 01010 – Summary of Work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Pipe
 1. Black carbon steel, ASTM A53/A53M, Grade B seamless or ERW. Threaded, butt-welded and flanged joints; Schedule 80.
 2. Pipe shall be of the nominal diameter (size) as indicated on the drawings and conforming to all requirements of ANSI/AWWA Standard C200 Steel Water Pipe, 6 Inch and Larger.

- B. Joints
 - 1. Butt-welded except at valves and equipment where joints shall be flanged.
- C. Fittings
 - 1. Wrought carbon steel butt-welding, ASTM A234/A234M, Grade WPB meeting the requirements of ASME/ANSI B16.9-2001, fitting wall thickness to match adjoining pipe; long radius elbows unless shown otherwise.
- D. Flanges
 - 1. Steel slip-on; flanges shall conform to ANSI/AWWA C207 Steel Pipe Flanges for Waterworks Service – Sizes 4 In. through 144 In.; flanges shall conform to the requirements of Table 2 or Table 3 in AWWA C207; flange shall have a Class D pressure rating, flat faced with concentric or spiral serrated finish, back-faced or spot-faced on the back.
- E. Bolting
 - 1. Bolts shall be carbon steel, ASTM A307 grade B, with ASTM A563 grade A heavy hex nuts. Bolts shall have hexagonal heads and nuts shall have hexagonal dimensions, all in accordance with ANSI B18.2.1 for wrench head bolts and nuts and wrench openings. Bolt diameters shall conform to the requirements of Table 2 or Table 3 in AWWA C207. Minimum bolt lengths shall be the sum of the mating flange maximum thicknesses, the gasket, and the depth of the nut plus 1/8 inch minimum before torquing.
- F. Gaskets
 - 1. Gaskets shall be red rubber (SBR) hardness (Shore A) 80 +/- 5, suitable for water service temperature to 200°F with gasket yield pressure of 200 psi minimum to 1,200 psi maximum, conforming to ASTM D1330, grades I and II. Gaskets shall conform to the requirements of Table 1 in AWWA C207.
- G. Substitutions: Under provisions of Section 01600

2.02 FINISH

- A. General
 - 1. The Interior Coating System for potable water piping shall be ANSI/NSF 61 Certified.
 - 2. City shall select the color for the exterior surface from the manufacturer's standard color chart.
 - 3. Coatings for new piping, fittings and flanges shall be applied in the shop.

4. Welds shall be stripe coated with an extra coat of Tnemec Series N140 Pota Pox Plus.
 5. Damaged coatings shall be touched up in the field.
- B. Interior Coating System (interior of fill line that will come in contact with potable water)
1. Surface Preparation: SSPC-SP10 (NACE No. 2); A minimum surface profile of 1.5 mils is required
 2. Provide three coats of Tnemec Series N140 Pota Pox Plus. Each coat shall have a DFT 7.0 - 9.0 mils.
 3. Provide a stripe coat of Tnemec Series N140 Pota Pox Plus between the first and second coat. DFT 3.0 - 5.0 mils.
- C. Exterior Coating System (pipe, fittings, flanges, pipe supports, tie rods; existing valve and valve operator; existing pipe and flanges; structural steel and plate in doorway)
1. Surface Preparation: SSPC-SP10 (NACE No. 2); A minimum surface profile of 1.5 mils is required
 2. Provide one coat of Tnemec Series 1 Omnithane. Each coat shall have a DFT 2.5 – 3.5 mils.
 3. Provide two coats of Tnemec Series N140 Pota Pox Plus. Each coat shall have a DFT 7.0 - 9.0 mils.
 4. Provide a stripe coat of Tnemec Series N140 Pota Pox Plus between the second and third coat. DFT 3.0 - 5.0 mils.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify size, material, joint types, elevation, horizontal location, and pipe service of existing pipelines to be connected to new pipelines or new equipment.
- B. Inspect size and location of structure penetrations to verify adequacy of wall pipes, sleeves and other openings.

3.02 PREPARATION

- A. Inspect pipe and fittings before installation, clean ends thoroughly, and remove foreign matter and dirt from inside.

3.03 INSTALLATION

A. General

1. Install in accordance with manufacturer's written instructions.
2. Before coupling, clean pipe of oil, scale, rust and dirt.
3. Remove foreign objects prior to assembly and installation.
4. Piping runs shall be parallel to building or column lines and perpendicular to floor, unless shown otherwise.

B. Piping

1. Install piping so that no load or movement in excess of that stipulated by equipment manufacturer will be imposed upon equipment connection; install to allow for contraction and expansion without stressing pipe, joints or connected equipment.
2. Provide suitable fitting or flexible connection in pipeline if existing flanged pipes will not allow proper installation of new piping.

C. Joints

1. Welds shall be sound, free from embedded scale and slag, have a tensile strength across the weld not less than that of the thinner of the connected sections, and that all pipe welds be water-tight. Butt welds shall be used for shop-welded joints in pipe, fittings and specials except where fillet welds are specified or shown. Fillet welds shall be used for flange attachment in accordance with AWWA C207. Fillet welds shall also be used in fabrication of pipe reinforcement and other locations where shown on the plans. Weld test specimens shall be furnished whenever requested by the City. Contractor shall follow the requirements of AWWA C206 and shall furnish the operator certificates prior to any field welding.
2. The use of back-up welding strips or rings for shop or field butt welds shall not be permitted. Welding of field joints shall conform to the applicable requirements of AWWA C206.
3. Leaks in welds shall be repaired by removing the defective material which caused the leak in each case and re-welding. No leak shall be repaired by mechanical caulking.

D. Flanges

1. Provide at each piping connection to equipment or instrumentation on equipment side of each block valve to facilitate installation and removal.

E. Finish

1. Coating shall be applied to the pipe, fittings, isolation valve and operator, pipe supports and structural steel per the applicable Society for Protective Coatings standard.

3.04 TESTING

- A. All piping, valves, and accessories installed under this contract shall be tested for tightness and leakage for a one (1)-hour period at 150% of normal operating pressure. The contractor shall provide all necessary equipment and shall perform all work required in connection with these tests. Piping will be tested by observation at normal operating pressures. The section tested shall be slowly filled with water, care being taken to expel all air from the pipes. If necessary, the pipes shall be tapped at high points to vent the air. All joints which are found to leak shall be made tight by approved methods or replaced by the contractor at no additional cost to the City.

3.05 CLEANING

- A. Clean as recommended by manufacturer. Do not use materials or methods, which may damage finish or surrounding construction.

END OF SECTION

SECTION 15110
ELECTRONIC CONTROL VALVE

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Electronic Control Valve
 - 2. Electronic Valve Controller
- B. Related Sections
 - 1. Section 15060 – Pipes and Pipe Fittings

1.02 REFERENCES

- A. NSF/ANSI 61 Drinking Water System Components

1.03 SUBMITTALS

- A. Submit under provisions of Section 01010 – Summary of Work.
- B. Product Data:
 - 1. Submit manufacturer's descriptive literature and product specifications for each product.
 - 2. Data on the electronic control valve shall include a computerized cavitation chart which shows flow rate, differential pressure, percentage of valve opening, Cv factor, system velocity, and if there will be cavitation damage. Data shall be from an accredited third party facility with hydraulic test data available upon request. Theoretical performance data will not be accepted.
- C. Shop Drawings:
 - 1. Indicate layout including dimensions
 - 2. Submit drawings showing field measured dimensions.

1.04 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01700 – Contract Closeout.
- B. Record information requested in Section 01700 – Contract Closeout

1.05 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 01700 – Contract Closeout.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section with minimum five (5) years' experience.
- B. Installer Qualifications: Acceptable to manufacturer with experience on at least five (5) projects of similar nature in past five (5) years.

1.07 PRE-INSTALLATION MEETING

- A. Conduct pre-installation meeting in accordance with Section 01039.
- B. Convene pre-installation meeting one week prior to commencing work of this Section.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 01600 – Material and Equipment.

1.09 GUARANTEE

- A. Comply with provisions of Section 01010 – Summary of Work.
- B. Valve manufacturer shall warrant the valve to be free of defects in material and workmanship for a period of three years from date of shipment.
- C. Valve manufacturer shall warrant the electrical components to be free of defects in material and workmanship for a period of one (1) year from date of shipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Cla-Val Co., Newport Beach, CA
- B. Substitutions: Under provisions of Section 01600

2.02 EQUIPMENT

- A. Electronic Control Valve
 - 1. Model No.: Cla-Val 133-42KX/BCSYKCKO
 - a) The Electronic Control Valve shall control flow, sustain upstream pressure and provide a metering output in conjunction with an electronic controller.
 - b) Valve Size: 24-inch full port
 - c) Main Valve Body & Cover: ductile iron
 - d) Main Valve Trim: stainless steel, anti-cavitation, radial slot-type (no holes, V-porting or orifice plate)

- e) End Detail: 150# flanged globe pattern
- f) Pressure Rating: to 250 psi working pressure
- g) Temperature Range: City Water
- h) Rubber Material: Buna-N
- i) Coating: Fusion epoxy of all iron components
- j) Options: opening and closing speed controls, X117D valve position transmitter, Endress+Hauser DP transmitter

2. Main Valve

- a) The valve shall be hydraulically operated, single diaphragm-actuated, globe pattern. The valve shall consist of three major components: the body with seat installed, the cover with bearing installed, and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls.

3. Main Valve Body

- a) No separate chambers shall be allowed between the main valve cover and body. Valve body and cover shall be of cast material. Ductile Iron is standard and other materials shall be available. No fabrication or welding shall be used in the manufacturing process.
- b) The valve shall contain a resilient, synthetic rubber disc with a rectangular cross-section contained on three and one-half sides by a disc retainer and forming a tight seal against a single removable seat insert. No O-ring type discs (circular, square, or quad type) shall be permitted as the seating surface. The disc guide shall be of the contoured type to permit smooth transition of flow and shall hold the disc firmly in place. The disc retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks. It must have straight edge sides and a radius at the top edge to prevent excessive diaphragm wear as the diaphragm flexes across this surface. No hour-glass shaped disc retainers shall be permitted and no V-type or slotted type disc guides shall be used.
- c) The diaphragm assembly containing a non-magnetic 303 stainless steel stem; of sufficient diameter to withstand high hydraulic pressures shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. The seat shall be a solid, one-piece design and shall have a minimum of a five-degree taper on the seating surface for a positive, drip-tight shut off.

No center guides shall be permitted. The stem shall be drilled and tapped in the cover end to receive and affix such accessories as may be deemed necessary. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure.

- d) The flexible, non-wicking, FDA approved diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The center hole for the main valve stem must be sealed by the vulcanized process or a rubber grommet sealing the center stem hole from the operating pressure. The diaphragm must withstand a Mullins Burst Test of a minimum of 600x per layer of nylon fabric and shall be cycle tested 100,000 times to insure longevity. The diaphragm shall not be used as the seating surface. The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully opened or fully closed position.
- e) The main valve seat and the stem bearing in the valve cover shall be removable. The cover bearing and seat in 6" and smaller size valves shall be threaded into the cover and body. The valve seat in 8" and larger size valves shall be retained by flat head machine screws for ease of maintenance. The lower bearing of the valve stem shall be contained concentrically within the seat and shall be exposed to the flow on all sides to avoid deposits. To insure proper alignment of the valve stem, the valve body and cover shall be machined with a locating lip. No "pinned" covers to the valve body shall be permitted. Cover bearing, disc retainer, and seat shall be made of the same material. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline. Packing glands and/or stuffing boxes shall not be permitted and components including cast material shall be of North American manufacture.
- f) The valve manufacturer shall warrant the valve to be free of defects in material and workmanship for a period of three (3) years from date of shipment, provided the valve is installed and used in accordance with all applicable instructions. Electrical components shall have a one (1)-year warranty.
- g) The valve manufacturer shall be able to supply a complete line of equipment from 1-1/4" through 24" sizes and a complete selection of complementary equipment.

The valve manufacturer shall also provide a computerized cavitation chart which shows flow rate, differential pressure, percentage of valve opening, Cv factor, system velocity, and if there will be cavitation damage. This report will be based on valves of all sizes having been tested at an accredited third party facility with hydraulic test data available upon request. Theoretical performance data will not be accepted.

4. Pilot Control System

- a) The 133-42 hydraulic control valve pilot system shall consist of dual solenoids which alternately apply or relieve pressure to the diaphragm chamber to position the main valve. The upstream solenoid shall be normally-open (de-energize to open) while the downstream solenoid shall be normally closed (energize to open). This will allow main valve to gradually fail-closed in case of power loss. Both shall be 120 volt AC with Nema type 4 enclosure. A manual system to by-pass the solenoids shall also be provided. A hydraulic pressure sustaining control shall be provided to sustain upstream pressure from going below a certain minimum pressure.
- b) Material Specification for Pilot Controls
 - 1. Body & Cover: bronze
 - 2. Trim: stainless steel
 - 3. Rubber materials: Buna-N
 - 4. Tubing & fittings: copper and brass
 - 5. Adjustment Range: 20-200 psi range
 - 6. Solenoid Voltage: 120/60 (loss of power, valve fails in closed position) stainless steel solenoid body
 - 7. Enclosure Type: NEMA 4

B. Electronic Valve Controller

- 1. Model No.: Cla-Val 131VC-3T
 - a) Control Input: 4-20 mA full scale
 - b) Control Parameters: 0-maximum flow
 - c) Proportional Bands: 1 to 200% adjustable in 1% increments independently for opening and closing
 - d) Deadband: Adjustable 0.00 to 25.5% of span
 - e) Cycle Time: 1 to 60 seconds in 1 second increments

2. Environmental Parameters
 - a) Temperature: 40° F to 130° F
 - b) Humidity: 90% RH, non-condensing
 - c) Power Input: 13.5 watts max at 117 VAC, 50/60 Hz
 - d) Memory Protection: 10 year type life; lithium battery
 - e) Housing: Flame retardant UL rated ABS plastic; Fits ¼ DIN cutout
3. The controller shall provide the interface between a remote computer system and the hydraulic control valve.
4. It shall have remote communication capability in both the analog or digital format. Local manual set-point and emergency manual control shall also be provided. The controller shall accept an analog 4-20 mA feedback signal with retransmission capabilities.
5. Upon receiving the remote set-point command from the computer system or local command from the operator, the controller will provide proper signals to modulate and maintain the valve at the desired set-point value.
6. A fluorescent display of current feedback status and set-point in scalable engineering units shall be provided as an integral part of the controller.
7. When the feedback signal deviates from the set-point, the appropriate opening or closing solenoid on the valve will pulse. As the feedback signal approaches the set-point, this on/off pulse time will gradually lessen to smoothly modulate the valve to the set-point. The total cycle time between each pulse shall be programmable between 1 and 60 seconds. A programmable time proportional output feature shall also function to aid in tuning valve response. When the feedback signal is within a programmable deadband zone, the opening and closing solenoids will not activate and the valve will maintain position.
8. The operator keypad shall consist of two (2) rows of alphanumeric characters to display numeric values and units. Color coded alarm, status and mode indicators will display operating conditions. Security key codes shall protect against unauthorized changes to the controller. All programming shall include key words and prompts to aid in set-up and timing the controller.
9. The controller shall be solid-state construction with an internal chassis capable of being removed for inspection and repair. All program memory including set-point and timing parameters shall be protected by an internal lithium battery rated for ten (10)-year life.

10. When optional remote digital communications are provided, the controller shall be capable of direct linkage to a computer or other instrumentation which has RS232C or RS422 communications. When RS 422 data highway communications is specified, up to 64 controllers may be addressed from a single computer port and shall operate up to 5000' from the computer. RS232C shall operate up to 50' distance between the computer or RTU and the valve controller. All set-point, tuning, and auto-manual operation shall be adjustable commands sent from the computer. Each transmission shall include the individual controller address. Communication baud rates shall be 300, 1200, or 2400 baud.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's printed instructions and approved shop drawings.

3.02 FIELD QUALITY CONTROL

- A. A direct factory representative shall be made available for start-up service, inspection and necessary adjustments
- B. Provide eight (8) hours of instruction in the start-up, operation, control, adjustment, trouble shooting, servicing, maintenance and shutdown of electronic control valve.

3.03 CLEANING

- A. Clean as recommended by manufacturer. Do not use materials or methods, which may damage finish or surrounding construction.

END OF SECTION

SECTION 16010
BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED SECTION

- A. Requirements specified within this section apply to all sections and shall be performed as if specified in the individual sections.

1.02 SCOPE OF WORK

- A. Contractor shall be responsible for the demolition, removal, and off-site disposal of the existing equipment as indicated on the contract drawings.
- B. Contractor shall furnish and install all electrical wire and conduit necessary to provide electrical power, signaling and control for the electrically operated fill valve and appurtenances indicated in the contract documents and contract drawings.
- C. Contractor shall furnish and install new lighting, conduit and accessories as indicated on the contract drawings.
- D. Contractor shall furnish Operation and Maintenance Manuals as required in Summary of Work, Section 01010, along with as-built drawings which reflect all field changes to the original drawings.

1.03 CODES AND PERMITS

- A. All work shall be performed and materials furnished in accordance with the National Electric Code (NEC), National Electrical Safety Code (NESC), and the following standards where applicable:

ANSI -	American National Standard Institute
ASTM -	American Society for Testing and Materials
Fed Spec -	Federal Specifications
ICEA -	Insulated Cable Engineers Association
IEEE -	Institute of Electrical and Electronic Engineers
IES -	Illuminating Engineering Society
NECA-	National Electrical Contractors Association
NEMA -	National Electric Manufacturers Association
NFPA -	National Fire Protection Association
UL -	Underwriters' Laboratories

PART 2 – PRODUCTS

2.01 GENERAL

- A. Provide materials and equipment listed by UL wherever standards have been established by that agency.

2.02 CONDUCTORS 600 VOLTS AND BELOW

- A. Conform to applicable requirements of NEMA WC 3, WC 5, and WC 7.
- B. Conductor Type: Conductors No. 10 AWG and smaller: solid copper. All other circuits stranded copper.
- C. Insulation Voltage Rating: 600 Volts.
- D. Insulation: ANSI/NFPA 70; insulation shall be rated for use at 75 °C minimum, in dry and wet locations.

2.03 CABLE RATED 600 VOLTS AND ABOVE

- A. General:
 - 1. Type: TC, meeting requirements of UL 1277, including Vertical Tray Flame Test at 20,000 BTU/hr, and NFPA 70, Article 340, or UL 13 Listed Power Limited Circuit Cable meeting requirements of NFPA 70, Article 725.
 - 2. Permanently and legibly marked with manufacturer's name, maximum working voltage for which cable was tested, type of cable, and UL Listing mark.
 - 3. Suitable for installation in open air, cable trays, or conduit.
 - 4. Minimum Temperature Rating: 75° C in dry and wet locations.
 - 5. Overall Outer Jacket: PVC flame-retardant, sunlight- and oil-resistant.
- B. Type 3-No. 16 AWG, Twisted, Shielded Pair, Instrumentation Cable: Single pair designed for noise rejection for process control, computer, or data log applications meeting NEMA WC 55 requirements.
 - 1. Outer Jacket: 45-mil nominal thickness.
 - 2. Individual Pair Shield: 1.35 mil double-faced aluminum /synthetic polymer overlapped to provide 100 per cent coverage.
 - 3. Dimension: 0.31-inch nominal OD.

4. Conductors:
 - a. Bare, soft annealed copper, Class B, seven-strand concentric, meeting requirements of ASTM B8.
 - b. 20 AWG, seven-strand tinned copper drain wire.
 - c. Insulation: 15-mil nominal nylon.
 - d. Color Code: Pair conductors black and red.

2.04 CONDUIT

- A. Conduit shall be rigid steel, heavy wall, hot-dip galvanized, and shall conform to Fed Spec WW-C-581 and ANSI C801.1, and shall be manufactured in accordance with UL 6.
Conduit shall be rigid steel ¾" minimum.
Rigid steel conduit shall be heavy wall, hot-dip galvanized, shall conform to Fed Spec WW-C-581 and ANSI C801.1, and shall be manufactured in accordance with UL 6.
- B. Liquidtight flexible metal conduit shall be used for all flexible connections. Liquidtight flexible metal conduit shall be hot-dip galvanized steel, covered with a moistureproof polyvinyl chloride (PVC) jacket, and shall be UL labeled.
- C. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers and fasten conduit supports to building structure and surfaces, grouping related conduits.
- D. Fasten conduit to concrete structural members using expansion anchors or preset inserts. Fasten conduit to concrete surfaces using expansion anchors or self-drilling anchors. All materials shall be corrosion resistant.

2.05 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 1. Wiring devices mounted inside of panels shall be NEMA OS 1, galvanized steel.
Cover Plates: As specified in Section 16140.
- B. Cast boxes: NEMA FB 1, Type FD, cast ferrous alloy. Provide gasketed cover, by box manufacturer, and threaded hubs.

2.06 PULL AND JUNCTION BOXES

- A. Cast Boxes: NEMA 250, Type 4, ferrous alloy, flat-flanged for surface mounting. Boxes shall be galvanized cast iron with neoprene gasketed cover and stainless steel cover screws.
- B. All contractor fabricated boxes shall be stainless steel.

2.07 ENCLOSURES AND CABINETS

- A. Enclosures: NEMA 250, Type 4X, fiberglass, flat-flanged for surface mounting. Enclosures shall include hinged, screw-type gasketed cover and subpanel.
- B. Enclosures shall include provisions for equipment grounding.

2.08 WIRING DEVICES

- A. Receptacles
 - 1. Manufacturer: Hubbell, Cooper Crouse-Hinds, approved equal.
 - 2. Description: NEMA WD 1, heavy-duty, specification grade, general use, receptacle with cover.
 - 3. Configuration: NEMA WD 6, type as specified and indicated.
 - 4. GFCI Receptacle and cover plate: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements, Type 5-20R, Hubbell Model GFR8300.

2.09 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, ¼ inch white letters on black background.
- B. Locations:
 - 1. Each electrical distribution and control equipment enclosure; controllers shall be labeled “West Fill Line Flow Control Valve”.
 - 2. Communication cabinets.
- C. Letter Size: Use 1/4 inch letters for identifying grouped equipment and loads.

- D. Labels: Embossed adhesive tape, with 3/16 inch (5 mm) white letters on black background. Use only for identification of individual wall switches and receptacles, control device stations, which shall include panel and circuit number.

PART 3 – EXECUTION

3.01 GENERAL

- A. Electrical drawings show general locations of equipment, devices and raceways, unless specifically dimensioned.
- B. Install work in accordance with NEC Code requirements and NECA Standard of Installation.
- C. Ground analog signal cable shield at Supervisory Enclosure only.

3.02 LOAD BALANCE

- A. Drawings and Specifications indicate circuiting to electrical loads and distribution equipment.
- B. Maintain accurate as-built records of electrical installation and changes made to existing circuits; update electrical panel directories to indicate new and abandoned loads.
- C. When loads must be reconnected to different circuits to balance phase loads, maintain accurate records of changes made.
- D. Update panelboard circuit directory for each branch circuit.

3.03 CHECKOUT AND START-UP

- A. Equipment Line Current Tests:
 - 1. Check line current in each phase for each piece of equipment.
 - 2. If any phase current for any piece of equipment is above rated nameplate current, prepare Equipment Line Phase Current Report that identifies cause of problem and corrective action taken.

END OF SECTION