ADDENDUM NO. 1

DATE: June 2, 2020

REVISIONS TO:
Request for Bids Specification No. PG20-0140F
Mayfield Water System and Road Realignment

NOTICE TO ALL Bidders:

This addendum is issued to clarify, revise, add to or delete from, the original specification documents for the above project. This addendum, as integrated with the original specification documents, shall form the specification documents. The noted revisions shall take precedence over previously issued specification documents and addenda and shall become part of this contract. Bidders are hereby notified that they shall make necessary adjustments in their estimates as a result this addendum.

CLARIFICATIONS

Pricing for the additive bid items including the new water storage tank, foundation, associated piping and demolition of existing water storage tanks shall be included in bids. Bidders cannot elect to omit a bid for additive items. If the additive bid items are to be included in the contract, they will be awarded along with the initial contract and shall be performed within the time allowed under this contract.

Bidders shall submit documentation of success and experience of both company and superintendent completing at least three (3) projects of similar scope and complexity. This documentation should include a brief description of the means and methods employed on the previous construction projects, as well as a brief description of the bidder’s proposed means and methods for completing the Mayfield Water System Replacement & Road Realignment. Winning bidder shall submit a schedule for construction after award of contract and will not be required as part of the bid submittal.

The specification calls for 3-inch and 8-inch DIPS (Ductile Iron Pipe Size) HDPE water pipe. Bidders may also use 3-inch and 8-inch IPS (Iron Pipe Size) HDPE.

Drawings and plans for the proposed Water Storage Tank (Additive bid items 1, 2 and 3) and rudimentary connections and details shown therein are for bidding purposes only. Tacoma Power will require engineered and stamped (by a WA state licensed professional engineer) plans of a complete water storage tank and respective foundation. If the Water Storage Tank is awarded as part of the winning bid, it will be the contractor’s responsibility to coordinate the design of such details as pipe expansion joints, seismic bracing, pipe penetrations, overflow prevention devices and drain outlets, etc. with the Tacoma Power and any subcontractors and the Lewis County Building Department.

The proposed Mayfield Water System Replacement project is primarily an HDPE pipe distribution system and shall consist of primarily HDPE butt-fused joints and fittings unless noted otherwise on the drawings. Such examples of the transitions from HDPE to DI (Ductile Iron) are the fire hydrant laterals and culvert crossing (Cove Ln.) wherein ductile iron is specifically called out. It will be the contractor’s responsibility to provide a viable and acceptable design for transitions from HDPE to DI at those locations.
The City has attempted to address each type of connection to existing services. The contractor shall provide all transition fittings and hardware to make up connections from new to existing water system piping. All cost of transitions will be included in the bid item titled “Intertie and Connection to Existing Water System”.

All inquiries and requests for clarification and/or verification regarding this project and specification need to be directed to Purchasing Division at 253-502-8468 or shefley@cityoftacoma.org.

REVISIONS TO THE SPECIAL PROVISIONS:

Replace Section 01010 Summary of Work with new section provided for adding prequalification requirements for electrical contractors as attached in this addendum.

Replace Section 02200 pages 3-4 with new pages provided.

ADDITIONS TO THE TECHNICAL PROVISIONS:

Construction Entrance at the Contractor Stockpile Area shall be installed in accordance with State Specification.

REVISIONS TO THE TECHNICAL PROVISIONS:

Replace Section 02660-Disinfection of Water Supply and Distribution Systems with new section provided.

Replace Section 02675-Disinfection of Water Supply and Distribution Systems with new section provided.

Replace Section 09900-Painting pages 3-4 with new pages provided.

REVISIONS TO THE PROPOSAL PAGES:

Replace Proposal Page 4 with new Proposal Page correcting the quantities of each 3-inch, 8-inch HDPE.

Replace Proposal Page 6 with new Proposal Page correcting Item 15 to the correct size. Bidders shall make the same change to Item No. 15 on Page 6 of Section 01025 – Measurement and Payment changing the size of the adapters from 4 inch to 3 inch.

NOTE: Acknowledge receipt of this addendum by initialing the corresponding space as indicated on the signature page. Vendors who have already submitted their bid/proposal may contact the Purchasing Division at 253-502-8468 and request return of their bid/proposal for acknowledgment and re-submittal. Or, a letter acknowledging receipt of this addendum may be submitted in an envelope marked Requests for Bids Specification No. PG20-0140F Addendum No. 1. The City reserves the right to reject any and all bids, including, in certain circumstances, for failure to appropriately acknowledge this addendum.
Specification PG120-0140F
Addendum No. 1
June 2, 2020

Patsy Best, Procurement and Payables Manager
Finance/Purchasing Division

Cc:  Jason Henry, Project Lead, Generation/Plant Engineering & Construction Services
     Terry Ryan, Assistant Generation Manager, Generation/Plant Engineering & Const Srvcs
<table>
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<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>BID UNIT</th>
<th>UNIT COST</th>
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<tr>
<td>ITEM 1</td>
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<td>Mobilization/Demobilization</td>
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<td>ITEM 2</td>
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<td>Pollution and Erosion Control Plan (PECP) / (TESC)</td>
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<td>ITEM 6</td>
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<td>Furnish and Install Fused Fittings, 3-inch DIPS HDPE, PE4710</td>
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<td>A) 90° Elbow</td>
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<td>$__________</td>
<td>$__________</td>
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<td>B) 45° Elbow</td>
<td>6</td>
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<tr>
<td>C) 22.5° or 11.25° Elbow</td>
<td>3</td>
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<td>$__________</td>
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<td>ITEM 7</td>
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<td>Furnish and Install Fused Fitting, 8-Inch DIPS HDPE, PE4710, PR-250psig</td>
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<td>2</td>
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<td>B) 45° Elbow</td>
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<td>D) Tee</td>
<td>8</td>
<td>EA</td>
<td>$__________</td>
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<td>E) 8x4 Reducer</td>
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<td>EA</td>
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<td>F) Cap</td>
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<td>ITEM 15</td>
<td>Furnish and Install 34-Inch HDPE x M.J. Adapters with S.S. Stiffener</td>
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<td>ITEM 16</td>
<td>Furnish and Install 8-inch HDPE x M.J. Adapters with S.S. Stiffener</td>
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<td>ITEM 18</td>
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<td>ITEM 22</td>
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<td>ITEM 24</td>
<td>Hydraulic Hammer</td>
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<td>ITEM 25</td>
<td>Trench Excavation</td>
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1.1 PROJECT DESCRIPTION

This project includes the replacement of the domestic water system and various improvements and upgrades to the infrastructure at Tacoma Power’s Hydroelectric System. The project will include the supply, construction and installation of a new 8-inch High Density Polyethylene (HDPE) water distribution system, a 3-inch HDPE supply line between the existing supply well-head and new storage tanks, the addition of various sized schedule-40 PVC conduits with pre-cast concrete vaults and road improvements to Gershick Rd. (a.k.a. Hydro Ln.). The proposed water distribution system will connect or ‘tie in’ to existing nodes or ‘small pipe networks’ at specific service areas identified on the plans. This project includes the installation of a new 60,000 gallon reservoir and foundation, and removal of existing tank and foundations and items. Water service to the entire project shall be maintained throughout the duration of the project.

This project also includes road improvements to the hydro-project’s entrance road, Gershick Rd. Road improvement consist of re-aligning and ‘shifting’ two (2) portions of Gershick Rd. several feet to mitigate slope erosion (sloughing) that has impacted Gershick Rd. during the past 20-30 years. Road improvements include the excavation and construction of a combination rock catchment and drainage ditch and culvert drainage improvements.

The Mayfield Hydro-Project site is rocky in nature and prone to large rocks and boulders. It is anticipated that many large rocks and boulders will be encountered during excavation and trenching activities. Contractor shall take this site characteristic into consideration when submitting their bids.

In all cases, the City’s contract is with one (1) general contractor and it is the general contractor’s responsibility to ensure all work require to provide a complete and operational system is included in their bid. It is the contractor’s responsibility to coordinate and schedule the work of all subcontractors, trades and suppliers to assure the proper and timely prosecution and completion of all items of work. Major components of work under this contract include, but are not limited to, the following list:

SPECIAL COVID-19 REQUIREMENTS:

The Contractor agrees herein to comply, and shall require that its subcontractors and supplies comply with any and all federal, state and local regulations, including but not limited to Proclamations pertaining to the current pandemic referred to as COVID-19, and shall apply all reasonable measures to protect, not only its employees, but all individuals on the construction site. It is further agreed and understood that a determination by any governmental official of non-compliance with this provision, shall be conclusive on the issue of compliance.

A. CONCEPT OF SCHEDULE

The Mayfield Water System Replacement is subject to permitting through local and state jurisdictions. The process began January 2019. It is expected that permits will be issued by June 2020 prior to any construction, and any conditions there from will be provided to bidders via addenda.
1.2 PROJECT LOCATION

This project is located at 253 Hydro Ln, Silver Creek, WA 98585, and as shown on Tacoma Power Drawing No. 60.1. The project is located in Lewis County, Washington.

1.3 SITE SHOWING

The bidder will be responsible for examining the site(s) and to have compared the sites with the specifications and contract drawings contained in this specification, and be satisfied as to the facilities and difficulties attending the execution of the proposed contract (such as uncertainty of weather, floods, nature and condition of materials to be handled and all other conditions, special work conditions including work schedules, obstacles and contingencies) before the delivery of their proposal.

No allowance will be subsequently made by the City on behalf of the bidder by reason of any error or neglect on the bidder’s part, for such uncertainties as aforesaid.

For a site showing contact Jason Henry at jhenry@cityoftacoma.org. Due to the nature of this project, the bidder is responsible for examining the site prior to placing a bid. Only one (1) site showing will be conducted. It is the bidder’s responsibility to assure that they attend the site showing once scheduled. Tacoma Power shall make no adjustment to the price or provide any compensation to the contractor for impacts relating to the contractor’s failure to consider the potential impacts of not only the site conditions observed, but changes in the observed conditions that could have been foreseen by the contractor.

By entering into the contract, the bidder represents that they have inspected in detail the project site and has become familiar with all the physical and local conditions affecting the project and/or the project site. Any information provided by the City to the contractor, relating to existing conditions on, under, or to the project and/or site including, but not limited to information pertaining to hazardous material abatement and other conditions affecting the project site, represents only the opinion of the City as to the location, character, or quantity of such conditions and is provided only for the convenience of the contractor. The contractor shall draw their own conclusions from such information and make such tests, review and analyses as the contractor deems necessary to understand such conditions and to prepare their proposal.

The City assumes no responsibility whatsoever with respect to the sufficiency or accuracy of such information and there is no guarantee, either expressed or implied, that the conditions indicated or otherwise found by the contractor as a result of any examination or exploration are representative of those existing throughout the work and/or project site.

The contractor shall carefully study and compare the contract documents with each other and shall at once report to the City errors, inconsistencies or omissions discovered. If the contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the contract documents without such notice to the City, the contractor shall assume the risk and responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction.

The contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the contractor with the contract documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported to the City at once.
1.4 COMMENCEMENT, PROSECUTION AND COMPLETION

The contractor will be required to complete the contract documents and to provide surety and payment bonds within ten (10) calendar days after the award of the contract. The contractor shall begin the work to be performed in the contract within ten (10) calendar days after the date of notification to commence work. Notification to commence work may either be by letter or, if no letter is issued, by agreement at the preconstruction conference (or if no letter is issued, by the date the contract is executed by the City).

The contractor shall be required to complete all work within one hundred thirty five (135) calendar days after the date of notification to commence work. If the contractor fails to complete all work within one hundred thirty five (135) calendar days, the City will assess liquidated damages in accordance with Section 3.14 of the General Provisions.

1.5 SPECIFICATION FORMAT

This specification is written and formatted for use with Public Works specifications and is numbered to be consistent with other specifications, including Construction Specifications Institute (CSI) format, as modified by the City. It is not intended to indicate what work is to be accomplished by various subcontractors on the project. In all cases, the City’s contract is with one (1) general contractor and it is the general contractor’s responsibility to insure all work required to provide a complete and operational facility is included in their bid.

When possible, the City has tried to reference work which should be included with various trades, but it is the contractor's responsibility to ensure all work is properly coordinated. The numbering system in the Special Provisions Section reflects standard provisions written by the City and assigned constant numbers. Thus, gaps will appear when specific sections are not used.

1.6 CONTRACT WORK TIMES

Contract work times shall be Monday through Friday, 7:00 a.m. to 5:00 p.m., excluding holidays, described in Section 2.13 of the General Provisions or as otherwise approved by the City.

If the contractor elects to work on a Saturday, Sunday, holiday or longer than the designated contract work times, such work shall be considered overtime work. On all such overtime work, a City engineer or their inspector must be present. The contractor shall reimburse the City for the full amount of the costs for City employees who must work any such overtime hours. It shall be the engineer's decision as to when an inspector is required. For the purpose of estimation of reimbursement of City employee's overtime, the bidder shall budget $50.00 per hour.

However, if the City orders work to be performed on overtime, all City employees' overtime costs will be at no expense to the contractor. The City will not require reimbursement for overtime hours worked by the City for inspection as detailed in the General Provisions if the conditions of this paragraph are met to the satisfaction of the engineer.

It is possible that other contractors or the City will be working in the project area during the time of construction. It shall be the responsibility of this contractor to coordinate its work with all other agencies and/or contractors within the project area.

The contractor shall also be responsible to minimize disruptions to access roads at the Mayfield Hydro Project. Directions of the engineer and/or inspector shall be followed at all times.
1.7 QUALIFICATION OF CONTRACTORS

A. QUALIFIED CONTRACTORS

Only contractors with management, employees, and staff experienced in the type of work required by this specification, and with a record of successful completion of projects of similar scope, complexity, and overall cost will be considered. The bidder must complete the Contractor’s Record of Prior Contracts form attached to this specification at the time of submitting their bid. The City will be the sole judge of the bidder’s ability to meet the requirements of this paragraph. Bidders past work will be judged in complexity of job, time of completion, organization, and other factors that may indicate the abilities of the contractor.

Submit to the engineer within ten (10) calendar days following execution of the contact documents, a list of all subcontractors, including each subcontractor’s address, telephone number, and contact person to be used on this project.

After completion of the project, an evaluation prepared on the form titled "Generation Contractor Performance Review" which is attached will be completed for the general and all subcontractors on this project. This form will be used to determine the adequacy of the work performed on this project including supervisor, quality of work, and adequate manpower and equipment, and the ability for the general or subcontractor to perform work for Tacoma Power in the future.

Any exception taken by any contractor to the comments on the form should be directed to the engineer within thirty (30) days of receipt. Failure to adequately respond to a poor evaluation within this time frame will be cause for rejection of future bids. The completed evaluation form will be shared with the contractor and subcontractors, but will be kept confidential by the City.

B. QUALIFIED SUPERINTENDENT

The contractor shall employ a competent superintendent as referenced in Section 01040 – Project Coordination, Paragraph 1.15 – Superintendent.

C. PREQUALIFICATION OF ELECTRICAL CONTRACTORS

As required in the Revised Code of Washington (RCW) 35.92.350 and in General Provisions section 1.09B, electrical construction or improvement work for this project shall be performed by an electrical contractor pre-qualified by Tacoma Power. It shall be the duty of every bidder to comply with the provisions of this Washington State Law and Tacoma Power requirements for the use of pre-qualified electrical contractors.

Proposal Items 19-23 shall be performed by an electrical contractor identified on the “2020 Tacoma Power Prequalified Electrical Contractors List” attached. Bidders must name on the included “List of Subcontractor Categories of Work” form a qualified firm or firms for the identified work elements. A prequalified electrical contractor may be the bidder itself, subcontractor(s), or a combination of both. Bids submitted without the named prequalified electrical contractor(s) shall be deemed non-responsive.

Additional information on the Pre-qualified Electrical Contractor Program may be viewed on the following website:

http://www.mytpu.org/contact/bids-contracts/prequalification-electrical-contractors.htm
1.8 SPECIFICATIONS AND DRAWINGS

All construction and reference drawings attached to this Specification, and listed on Drawing G0.2 (MP4561) are part of this contract.

Drawings for Reference

<table>
<thead>
<tr>
<th>Drawing No.</th>
<th>Title</th>
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<tbody>
<tr>
<td>MH-1652</td>
<td>GENERAL LAYOUT, POWERHOUSE TO SWITCHYARD, DUCT BANK</td>
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<td>MH-1672</td>
<td>POTABLE WATER SYSTEM, ELECTRICAL INSTALLATION</td>
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<tr>
<td>MN-200</td>
<td>SWITCHYARD, CONTROL HOUSE PLUMBING AND FIRE HYDRANT</td>
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<td>MN-201</td>
<td>POTABLE WATER, RELOCATION OF WATER STORAGE TANKS AND PIPES TO, STATION 14+00</td>
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<td>MN-203</td>
<td>POTABLE WATER, PROFILE, STORAGE TO, STATION 14+00</td>
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<tr>
<td>MN-204</td>
<td>POTABLE WATER PLAN AND PROFILE, STATION 14+00, TO POWERHOUSE ANNEX AND DETAILS</td>
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<td>MN-205</td>
<td>POTABLE WATER, PLAN AND PROFILE – PUMP, TOWATER STORAGE TANKS</td>
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<td>MN-206</td>
<td>POTABLE WATER PUMP AND HYPOCHORINATOR AND HOUSE, ARRGMNT AND DETAILS</td>
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<td>MN-208</td>
<td>MAYFIELD PROJECT (MECH), POTABLE WATER SYSTEM, PIPING AND TRENCHING</td>
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<td>MN-220</td>
<td>MAINTENANCE GARAGE, PLUMBING AND PIPING, PLAN AND SCHEDULE</td>
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<tr>
<td>MP1551</td>
<td>MAYFIELD SUPERVISOR’S RESIDENCE, SITE PLAN</td>
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<td>MP1553</td>
<td>MAYFIELD OFFICE BUILDING, SITE PLAN AND UTILITIES TRENCH</td>
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<td>MP1563-1</td>
<td>MAYFIELD OFFICE BUILDING, PLUMBING AND HVAC, UNDERGROUND FLOOR PLAN</td>
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<td>MP4339</td>
<td>MAYFIELD POWER PLATN, DOMESTIC WATER SYSTEM, KEY MAP</td>
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<td>MP4340</td>
<td>MAYFIELD POWER PLANT, DOMESTIC WATER SYSTEM, SITE PLAN</td>
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<td>MP4341</td>
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Drawings for Construction

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<tr>
<td>MP4560</td>
<td>COVER SHEET &amp; VICINITY MAP</td>
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<td>MP4561</td>
<td>SHEET INDEX</td>
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<tr>
<td>MP4562</td>
<td>KEY MAP</td>
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<tr>
<td>MP4563</td>
<td>SURVEY &amp; STATIONING CTRL, (SHEET 1 OF 3)</td>
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<td>MP4564</td>
<td>SURVEY &amp; STATIONING CTRL, (SHEET 2 OF 3)</td>
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All contract drawings are reduced to approximately half-size. Typical full-size prints are available and may be inspected by prospective bidders in the office of the Assistant Generation Manager - Generation Section, Tacoma Power, Third Floor, Tacoma Public Utilities Building, 3628 South 35th Street, Tacoma, Washington. Copies of original drawings may be obtained through the engineer during the bidding period. The contractor will be required to pay for all City-made full-size prints.
A maximum of two (2) sets of specifications and one (1) set of full-size reproducible drawings will be furnished to the successful bidder for construction purposes. It shall be the contractor’s responsibility to provide sufficient sets of drawings for building purposes.

The contractor shall keep on the job site a full-size copy of the drawings and the specifications, and shall, at all times, give the engineer access thereto.

1.9 EVALUATION OF BIDS

The award of this contract will not be based on cost alone as other factors and features are equally important. The contract will be awarded to the lowest responsive and responsible bidder complying with the specifications; provided such bid is reasonable and it is in the best interests of the City to accept.

The City, however, reserves the right to reject any and all bids and to waive any informalities in bids received. The City reserves the right to let the contract to the lowest responsive and responsible bidder whose bid will be most advantageous to the City, price and any other factors considered.

All other elements or factors, whether or not specifically provided for in this contract, which would affect the final cost to and the benefits to be derived by the City will be considered in determining the award of the contract. In addition, the bid evaluation factors set forth in Tacoma Municipal Code Section 1.06.262 may be considered by the City. The conclusive award decision will be based on the best interests of the City. The engineer’s decision as to which contractor best meets the City’s need will be final.

In addition to General Provisions Section 1.08, the following factors will be used in bid evaluation:

A. Experience and success of both company and superintendent completing at least three (3) projects of similar scope, complexity and overall cost.

B. Proposal prices and base bid.

C. Review of all required submittals.

D. Past record with the City (including satisfying safety requirements).

E. Bidder’s responsibility based on, but not limited to:
   1. Ability, capacity, organization, technical qualifications and skill to perform the contract or produce the services required.
   2. Contractor’s construction record including references, judgment, stability, adequacy of equipment proposed to be furnished.
   3. Whether the contract can be performed within the time specified.
   4. Quality of performance of previous contracts or services

During the term of this contract, other City of Tacoma Departments/Divisions shall have the right to enter into additional service contracts or issue purchase orders based on the unit prices and/or service rates stated in this contract. An exception taken specifically to this provision at time of submittal shall not constitute a material deviation in the bidding process.
1.10 LIST OF SUBCONTRACTORS’ AND CONTRACTOR’S CATEGORIES OF WORK

Bid proposals for construction including alteration or repair where the contract is estimated to exceed $1,000,000 including tax shall satisfy the following requirement: **Bidder shall complete the enclosed List of Subcontractors’ and Contractor’s Categories of Work in its entirety, and return completed form as part of the bid submittal package.**

Bidder shall list all subcontractor(s) that are proposed to perform the work of heating, ventilation, and air conditioning, plumbing as described in Chapter 18.106 RCW and electrical as described in Chapter 19.28 RCW. **Failure to comply with this provision will require the City (pursuant to state law, RCW 39.30.060) to determine that bidder’s bid is non-responsive; therefore, the bid will be rejected. (See General Provisions - Section 3.16 - List of Subcontractors.)**

1.11 LOCAL EMPLOYMENT AND APPRENTICESHIP TRAINING PROGRAM (LEAP)

Participation in LEAP is not required for this project. However, contractors are encouraged to volunteer in the LEAP Program. Following are the LEAP Program goals:

LEAP is a mandatory City of Tacoma program that requires the prime contractor or service provider performing a qualifying public works project or service contract to ensure that 15-percent of the total labor hours worked on the project are performed by apprentices approved by the Washington State Apprenticeship Council (SAC) and/or residents of Tacoma. Compliance may be met through any combination of utilizing residents of Tacoma or SAC apprentices. The accompanying LEAP Regulations and forms are included in these specifications.

If the project is located within the Tacoma Power hydro project areas, then 25-percent of the LEAP requirement may be satisfied utilizing a resident of the project area.

The project engineer will estimate the required LEAP labor hours to be performed for each qualifying contract. The engineer’s estimated LEAP hours are reflected in the enclosed form titled, “Prime Contractor LEAP Utilization Plan,” under the LEAP Section. **This form is to be completed and presented at the pre-construction meeting.**

LEAP can assist contractors in the recruitment, screening and selection of qualified City of Tacoma applicants interested in a career in the building & construction trades. Residents can be screened and provided with education, training and support services that lead to employment with your company. Contractors/vendors may obtain further information by contacting the City’s LEAP Office at 253-591-5826 or e-mail Clifford Armstrong at carmstrong@cityoftacoma.org. The LEAP Office is located in the City’s Community & Economic Development Department, Tacoma Municipal Building, 747 Market Street, Room 808, Tacoma, Washington 98402.

1.12 PREVAILING WAGES

In addition to the requirements of Section 3.09(B) of the General Provisions, the contractor shall be required to post on the job site a copy of the intent form to pay prevailing wages.

As identified in the General Provisions, the contractor shall comply with the law regarding prevailing wages. These rules apply to any contractor who does business with the City, including owner/operators.
A Statement of Intent to Pay Prevailing Wages MUST be filed with the Washington Department of Labor & Industries upon award of contract. An Affidavit of Wages Paid MUST be filed with the Washington Department of Labor & Industries upon job completion.

Payments cannot be released by the City until certification of these filings are received by the engineer. Additional information regarding these submittals can be obtained by calling the Department of Labor & Industries, Prevailing Wage at 360-902-5335, or by visiting their web site at: http://www.lni.wa.gov/tradeslicensing/prevailingwage/default.asp

1.13 PERFORMANCE (SURETY), PAYMENT AND RETAINAGE BONDS

A. PERFORMANCE (SURETY) AND PAYMENT BONDS

The Contractor shall provide both a Surety and Payment Bond for 100-percent of the total contract award within ten (10) calendar days after award of the contract in accordance with the General Provisions. These bonds shall be required for each contact awarded under this specification.

B. RETAINAGE BOND

A 5-percent retainage bond may be provided in lieu of the City withholding five-percent retainage. If a retainage bond is not obtained, the City will withhold 5-percent retainage until the end of the contract. If a retainage bond is provided, the City form must be used. Contractor shall provide notice of intent to provide retainage bond ten (10) days prior to first invoice. The City may elect to allow submission of retainage bond after the first payment at its discretion.
### Utility Tape Color

<table>
<thead>
<tr>
<th>Utility</th>
<th>Tape Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Blue</td>
</tr>
<tr>
<td>Electrical</td>
<td>Red</td>
</tr>
<tr>
<td>Communication</td>
<td>Orange</td>
</tr>
</tbody>
</table>

The width of the tape shall be as recommended by the manufacturer for the depth of the installation.

## PART 3 EXECUTION

### 3.1 CONSTRUCTION DETAILS

Upon completion of all clearing and grubbing operations and after all excavation and reconsolidation of in-situ materials is complete to the satisfaction of the engineer, road ballast, bank run gravel, and a crushed surfacing top course shall be applied at the locations shown on the drawings and further specified in these specifications. Soil sterilant shall be applied prior to installing ballast.

The contractor shall submit the name of the aggregate materials suppliers. Provide materials from the same source throughout the project. Change of source requires engineer approval.

Aggregate materials which the contractor intends to store on-site shall separate differing materials with dividers or stockpile apart to prevent mixing.

### 3.2 CLEARING AND GRUBBING

All work shall be done in accordance with Section 2.01 of the Standard Specifications.

*The contractor shall fell, limb, buck and otherwise remove all trees within the flagged clearing limits or to the extent necessary to efficiently install proposed utilities and haul subsequent logs to the “Contractor Stockpile Area” as indicated on drawing MP4560.*

The Contractor shall clear, grub, and cleanup those areas contained within the “Clearing & Grubbing” limits indicated on the Plans.

Trees, stumps, shrubs, and brush located outside the Clearing & Grubbing limits shall be considered as part of the “Clearing & Grubbing” when identified for removal on the Plans.

The contractor shall remove all debris and decaying material, such as trees, stumps, roots, shrubs, topsoil, brush, weeds, and grass from the site in the way of work and within 6 feet of each side of the proposed trench alignment. All holes resulting from stump removal shall be backfilled and compacted with backfill material from the trench to provide a neat workmanship appearance.

*The contractor shall remove all debris and decaying material, such as stumps, roots shrubs, topsoil, brush, weeds, and grass from the flagged clearing site and within 6-feet of each side of the proposed utility trench alignment. All holes resulting from stump removal shall be backfilled and compacted with backfill material to provide a neat workmanship appearance.*

#### A. CLEARING
1. Fell trees only within the area to be cleared.
2. Close-cut parallel to the slope of the ground all stumps to be left in the cleared area outside the slope stakes.
3. Close cut all stumps that will be buried by fills 5-feet or less in depth.
4. Follow these requirements for all stumps that will be buried by fills deeper than 5-feet from the top, side, or end surface of the embankment or any structure and are in a location that will not be terraced as described in Section 2-03.3(14)
   a. Close-cut stumps under 18-inches in diameter to no more than 12-inches above original ground level.
   b. Trim stumps that exceed 18-inches in diameter to no more than 12-inches above original ground level.
5. Leave standing any trees or native growth indicated by the Engineer or Inspector.
6. Trim all trees to be left standing to the height specified by the Engineer, with a minimum height of eight (8) feet above sidewalk grade and fourteen (14) feet above the roadway surface. Neatly cut all limbs close to the tree trunk.
7. Thin clumps of native growth as the Engineer may direct.
8. Protect, by fencing if necessary, all trees or native growth from any damage caused by construction operations. Protect existing fence. Any damage to fence shall be contractor’s responsibility to make all repairs and shall be incidental to the contract.

The Contractor shall dispose of all debris in accordance with Section 2-01.2(2).

3.3 EXCAVATION AND GRADING

All materials to be removed and replaced shall be native materials. All materials shall be compacted in lifts as stated therein.

Prior to performing any grading operations, the contractor shall:
   A. Verify site conditions, survey bench marks and elevations for the work are as indicated.
   B. Locate, identify, and protect utilities from damage.
   C. Fill areas to required grades or blend into existing grades as directed with approved backfill materials.

After the stripping and clearing of the site preparation work have been completed, the exposed surface should be scarified to a depth of at least eight 8-inches, moisture-conditioned to optimum moisture content, and mechanically compacted to the requirements for engineered fill as described below. Excavations below the finish grade, including grub holes and ditches, should be cleaned of all deleterious fill pockets and loose or disturbed soil prior to backfilling.

All excavated material shall be used for site filling and/or grading if directed by the engineer. Material deemed unsuitable by the field inspector for site filling and grading shall be stockpiled at a site within the Mayfield project limits and the cost incidental to the contract.

Remediate over-excavated areas as directed by the engineer or field inspector with approved backfill material.

Excavation includes the removal and disposal of all debris, including submerged and buried timber, and all pumping that may be necessary for draining and dewatering the excavation. It shall also include the furnishing of all equipment necessary for the performance of this work, the placement of all necessary backfill within the limits excavated, and the disposal of excavated material that is not required for backfill.

Excavation also includes all work, and expense involved in the construction, placing, and subsequent removal of shoring, cribs, casings, and cofferdams and shall be incidental to the site work including the “Trench Excavation Safety System.”
PART 1  GENERAL

1.1  SUMMARY
This section includes site supply and distribution piping, fire hydrants and supply piping, valves and miscellaneous fittings.

1.2  DEFINITIONS
A. WATER SUPPLY PIPE
A pipe that conveys water from the source ground-well to the storage tanks.
B. WATER DISTRIBUTION PIPE
A pipe on the premises that conveys water from the storage tanks or meter to the points.
C. WATER SERVICE PIPE
The pipe from the main or other source of potable water supply to the point of service location.
D. Pipe sizes used in this standard are nominal pipe size (NPS).

1.3  SUBMITTALS
A. Product Data: Three (3) required, for each piping specialty and valve specified.
B. Certification of Compliance: Certification of Compliance with ASME and UL fabrication requirements specified below.
C. Test Reports: Test reports specified in Part 3 of this Section.
D. Maintenance Data: Maintenance data for each piping specialty and valve specified for inclusion in Maintenance Manual specified Division 15 Section - "Basic Mechanical Requirements."

1.4  QUALITY ASSURANCE
A. MANUFACTURER’S QUALIFICATIONS
1. Manufacturer shall have a minimum of five (5) years’ recent experience producing HDPE pressure pipe and fittings for at least the specified sizes and lengths, and shall be able to submit documentation of at least five (5) installations in satisfactory operation for at least years.
2. HDPE pipe and fittings manufacturers and distributors shall be listed as current members of the Plastic Pipe Institute (PPI).
3. Fusion operators shall have received current training and certification per PPI TN-42.
4. Ductile iron pipe and fittings shall be manufactured in accordance with ANSI A21.51, Ductile Iron Pipe Centrifugally Cast in Metal molds or Sand-Line Molds for Water or Other Liquids, and be made of ductile iron having a minimum tensile strength of 60,000-psi, a minimum yield strength of 42,000-psi and 10 percent minimum elongation.

1.5  DELIVERY, STORAGE, AND HANDLING
A. Ship and store in accordance with manufacturer’s recommendations.
B. Inspect all materials during unloading process and before installation.
C. Notify City of any cracked, flawed or otherwise defective material. Remove all materials from site that are found to be unsatisfactory. Sections of pipe with cuts and gouges exceeding ten (10) percent of the pipe wall thickness or kinked sections shall be removed and the ends rejoined.

D. Handle pipe in a manner that does not over stress the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed fifty (50) percent of yield stress for flexural bending of the pipe. If the pipe is buckled or otherwise damaged, the damaged section shall be removed and replaced by the contractor at their expense. Use rollers to move system: avoid dragging system on ground or over sharp objects.

**PART 2 MATERIALS**

### 2.1 WATER SERVICE LINES

**A.** All 3-inch and 8-inch diameter water pipe shall be HDPE PE4710 DR9, unless noted otherwise in the plans. All HDPE pipe shall be DIPS (Ductile Iron Pipe Size) and meet AWWA C901 or C906, NSF No. 61 and ASTM standards. HDPE pipe shall be butt-fusion type. HDPE pipe shall have Flange/MJ Adapters butt-fused when transitioning to or from ductile iron. Pipe must be manufactured in accordance with AWWA standards and certified for use in domestic water systems.

**B.** The water service connection pipe shall be Schedule 40 polyvinyl chloride (PVC). All Schedule 40 PVC pipe shall be manufactured in strict compliance to ASTM D1784 and D2665 standards. The pipe shall carry the National Sanitary Foundation (NSF) seal of approval for potable water applications. All pipe shall be stored indoors after production at the manufacturing site until shipped from factory.

**C.** ‘Ductile iron’ portions of the distribution system as noted in the plans, shall be 8-inch diameter centrifically cast Class 52 water pipe. Contractor supplied ductile iron pipe shall be Mechanical Joint (MJ) type with cement mortar lining meeting the requirements of AWWA C151, Installation of Ductile Iron Water Mains and their Appurtenances. All materials shall conform to American Water Works Association (AWWA, Ductile Iron Pipe Research Association (DIRPA) and Plastic Pipe Institute (PPI). Acceptable manufacturers include:

- a. McWane Cast Iron Pipe Company
- b. American Cast Iron Pipe Company
- c. Pacific States Cast Iron Pipe Company
- d. US Pipe and Foundry Company

**D 8-inch C-900 shall be Blue Brute PVC as manufactured by JM Eagle, 200 psi (DR 21), meeting ANSI/NSF Standard 61, UL 1285**

**E.** All connections to gate valves, shall be Mechanical Joint (MJ) type.

**F.** HDPE Flanged and Mechanical Joint (MJ) adapters shall be attached to pipe and fitting using butt-fusion.

**G.** Pipe and fittings shall be installed using procedures recommended by the manufacturer.

### 2.2 SERVICE CONNECTIONS

**A.** All service connections shall be made up of fused HDPE reducing tee and Apollo ball valve (or equal) and transitioning from HDPE to PVC pipe.
2.3 FITTINGS

A. Unless noted otherwise, all 8-inch distribution fittings shall be HDPE PE 4710 butt-fusion type. Butt fusion fittings shall be manufactured in accordance with ASTM D3261 and have a Pressure Rating (PR) equal to the HDPE DR9 pipe unless otherwise specified in the plans. Fabricated fittings are to be manufactured using Data Loggers. All fittings shall be suitable for use as pressure conduits, and per AWWA C906 standards.

B. Unless noted otherwise, all 3-inch supply fittings shall be HDPE PE 4710 butt-fusion type. Butt fusion fittings shall be manufactured in accordance with ASTM D3261 and have a Pressure Rating (PR) equal to the HDPE pipe unless otherwise specified in the plans. Fabricated fittings are to be manufactured using Data Loggers. All fittings shall be suitable for use as pressure conduits, and per AWWA C906 standards.

C. Flanged and Mechanical Joint (MJ) fittings shall be ductile iron. All ductile iron fittings shall conform to the latest revision of ANSI/AWWA C153, American Standard for Ductile-Iron Compact Fittings. All work to install ductile iron shall be in accordance with ANSI/AWWA C151, Installation of Ductile Iron Water Mains and their Appurtenances.

D. HDPE pipe and fittings may be joined together using Flanges or Mechanical Joint (MJ) adapters. Flange/MJ adapters shall be PE 4710 HDPE. Flanges/MJ adapters shall be manufactured in accordance with ASTM D3261 standards. The flanges/MJ adapters shall be aligned and centered relative to the pipe. Flanges/MJ adapters should be square with the valve or other flange before tightening of bolts. Bolts should not be used to draw flanges into alignment. Bolt threads shall be lubricated, and flat washers shall be used under flange nuts. Bolts shall be tightened using a "star tightening pattern", see manufacturers’ recommendations. Twenty-four (24) hours after first tightening the flange bolts, they must be re-tightened using the same "star tightening pattern" used above. Final torque shall be as indicated by the manufacturer.

E. High Density Polyethylene (HDPE) pipe and fittings may be joined together using approved electrofusion couplings. HDPE electrofusion fittings shall be PE 3608 or PE 4710 HDPE and manufactured in accordance with ASTM F1055 standards. All Electrofusion fittings shall have Pressure Rating (PR) equal to the pipe unless otherwise specified on the plans. All electrofusion fittings shall be suitable for use as pressure conduits in accordance with AWWA C906 standards.

F. Ductile iron pipe and fittings shall be joined together using Mechanical Joint (MJ) and shall be installed and bolts tightened in the sequence and torque specifications published in A Guide for the Installation of Ductile Iron Pipe by the Ductile Iron Pipe Research.

G. All flanged connections shall be made using Teflon ring gaskets.

2.4 MECHANICAL JOINT RESTRAINT

A. The mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe increasing its resistance as the pressure increase.

B. Flexibility of the joint shall be maintained after burial.

C. Glands shall be manufactured of ductile iron conforming to ASTM A536-80.

D. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of the latest revision.

E. Twist-off nuts, sized same as tee-head bolts, and shall be used to insure proper actuating of restraining devices.
F. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., Megalug, or approved equal.

G. For mechanical joint fittings, full lengths of pipe must be installed on outer side of tees, ells, reducers, or assemblies as directed by the engineer.

2.5 VALVE BOXES

1. Gate valves along the HDPE water mains shall have a 6-inch minimum I.D. cast iron adjustable valve box, Star Pipe Products Model 045

2. Valve lid shall be secured to box so that a wrench or special tool is required for lid removal.

3. Place supporting bricks under box so valve does not bear on valve. All boxes shall be set plumb.

2.6 FIRE HYDRANT LATERALS

A. Laterals for Fire Hydrants shall be 6-inch Ductile Iron, class 52 and restrained with Mega Lugs. All ductile iron pipe shall meet AWWA C151 specifications. Fittings shall conform to the latest revision of ANSI/AWWA C153.

2.7 FIRE HYDRANT

Fire hydrants furnished under these specifications shall conform to the ANSI/AWWA C502, Specifications for Dry-Barel Fire Hydrants, with the following limitations and exceptions:

A. Drawings: Drawings shall be of adequate size showing principal dimensions, material, and finish.

B. Acceptable Products:
   a. Clow “Medallion”
   b. Kennedy “Guardian K81D”
   c. M&H 929, “Reliant” (casting date of 1997 or later)
   d. Mueller “Super Centurion 250”
   e. US Pipe M-94
   f. Waterous Pcer/WB67-250, Tacoma

C. Capacity - Standard size - two-hose and one-pumper nozzle.

D. Size - Standard size shall be 5-1/4-inch main valve with 6-inch inlet bell. All hose nozzles shall be 2-1/2 inches. Unless otherwise indicated in the special Provisions and/or the Drawings, all pumper nozzles and quick connect fittings shall be as specified on standard drawing 17-56-1.

E. Length - Contractor shall verify proper depth of bury of fire hydrant prior to installation.

F. Hydrant Inlet - All hydrants shall be provided with mechanical joint inlet.

G. Operating Mechanism - All moving contact surfaces shall be bronze on bronze or bronze on iron or steel as may be approved by the Superintendent. The hydrants shall have the main valve seat threaded into a bronze sub-seat in the shoe of the hydrant to permit easy removal of the main valve seat. The bronze sub seat shall be; threaded into the shoe of the fire hydrant, or the sub seat shall be attached to the shoe of the fire hydrant independently from the barrel to shoe connection.

H. Direction of Opening - All hydrants shall open by turning the operating nut to the left (counter-clockwise).
I. **Hydrant Barrels** - All hydrant barrels shall have a flange located at least 2 inches above the finished grade line and flanged extension sections shall be available in increments of 6 inches.

J. **Operating Nuts for Stem and Nozzle Caps** - The operating stem and cap nut shall be pentagonal in shape. The pentagon shall measure 1.35 inches from the point to the flat, at the base of the nut and 1.23 inches at the top. The faces shall be tapered uniformly and the height of the nut shall not be less than 1.0 inches. The point to the flat dimension shall be measured to the theoretical point where the faces would intersect were there no rounding off of the corners. All nozzles shall be fitted with cast iron threaded caps with operating nut of the same design and proportions as the stem nut. Caps shall be threaded to fit the corresponding nozzles and shall be fitted with suitable gaskets for positive water tightness.

K. **Fire Hydrant Quick Connect Coupling** – The fire hydrant quick Connect Coupling (aka Storz Coupling) shall be in compliance with the latest version of “NFPA 1963, for non-threaded Metal-Faced Hydrant Connections”. The size of the Quick Connect Coupling and hydrant pumper nozzle threads will be as shown on standard drawing 17-56-1.

L. **Nuts and Bolts** - All nuts and bolts below ground level shall be stainless steel.

M. **Hydrant Dimensions**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrant connection D.I. Pipe ins. dia.</td>
<td>6-inch</td>
</tr>
<tr>
<td>Standard, minimum dia.</td>
<td>6-7/8 inch</td>
</tr>
<tr>
<td>Length of 4.5 ft. bury, hydrant from bottom of hydrant connection to sidewalk ring.</td>
<td>4 feet, 8 inches</td>
</tr>
<tr>
<td>Valve opening minimum dia.</td>
<td>5-1/4 inches</td>
</tr>
<tr>
<td>Hose Nozzles-number and size</td>
<td>2 - 2-1/2-inch</td>
</tr>
<tr>
<td>Thread (Nat. Board Fire Underwriters)</td>
<td>7-1/2 per inch</td>
</tr>
<tr>
<td>Outside dia. Finished</td>
<td>3-1/16 inch</td>
</tr>
<tr>
<td>Dia. at root of thread</td>
<td>2.8715 inch</td>
</tr>
<tr>
<td>Pattern of thread</td>
<td>60° V thread</td>
</tr>
<tr>
<td>Total length of threaded male Nipple</td>
<td>1-inch</td>
</tr>
<tr>
<td>Pumper Nozzles-number and size</td>
<td>1 - 4-inch</td>
</tr>
<tr>
<td>Thread, outside dia. finished (with .02&quot; cut off top)</td>
<td>5.09-inch</td>
</tr>
<tr>
<td>Dia. at root of thread (with .02&quot; left in valley)</td>
<td>4.74-inch</td>
</tr>
<tr>
<td>Threads</td>
<td>4” NST</td>
</tr>
<tr>
<td>Pattern of thread-modified</td>
<td>60° V thread</td>
</tr>
<tr>
<td>Total length of threaded male nipple</td>
<td>1-1/8-inch</td>
</tr>
</tbody>
</table>
2.7 THRUST BLOCKS

A. Concrete thrust blocks shall be cast-in-place against native, undisturbed soil.

B. Concrete can either be mixed thoroughly in clean containers at the job site under the supervision of the inspector or mixed at a batch plant.

C. The contact surface area against native soil shall be in accordance with Tacoma Water’s standard thrust block sizing table.

D. The contact area between the concrete and the pipe shall create a cradle to evenly distribute the resisting forces across the pipe fitting per AWWA standards.

E. Place 6-mil plastic between the concrete and fitting.

F. The mixing of all concrete mixed on-site shall be observed by the inspector.

2.8 BALL VALVES

All ball valves shall be Apollo, Bronze Ball valves, 70-100 series.

2.9 TAPE

Buried utility warning and identification tape, manufactured specifically for warning and identification of buried utilities lines, yellow or orange with metallic backing to serve as a tracer wire for Schedule 40 PVC only, shall be used by the contractor.

2.10 GATE VALVES

All gate valves shall be resilient seat and shall comply with the ANSI/AWWA Standard as listed below:

A. RESILIENT SEAT GATE VALVES

1. Shall conform to the latest revision of AWWA Standard C-509/515, UL listed and FM approved.

2. Shall be as manufactured as follows:
   a. Clow Model 2638, 2639, or 2640
   b. M&H Style 4067 or 7000 Series
   c. Kennedy Model KS-FW and KS-RW
   d. Mueller Style 2360
   e. American Flow Series 2500
   f. US Pipe Metroseal 250
   g. AVK-series 25 or 65
   h. NIBCO 619-RW series
   i. East Jordan Flowmaster

3. Engineer Approved Equal meeting the following requirements:
   a. Shall be non-rising stem and shall have a 2-inch square operating nut that operates left (counter clockwise) to open.
   b. Shall have the body and bonnet coated with a fusion bonded epoxy coating meeting all the application and performance requirements of AWWA C550.
   c. All gate valve ends shall be as shown on the project drawing and conform to the applicable ANSI/AWWA Standard.
d. Mechanical joint and push-on joint must conform to ANSI/AWWA C111, A21.11.
e. Flanged ends shall conform to ANSI B16.1 class 125 or C110 A21.10.
f. All bonnet and packing butts and bolts shall be stainless steel.

**2.11 T-HEAD BOLTS**

Unless specified otherwise, all T-head bolts and nuts supplied for mechanical joint fittings, valves, sleeves, coupling, hydrants, tapping sleeves, etc., shall meet the following requirements:

A. Made of high-strength, low alloy steel conforming to ANSI/AWWA C111 corrosion resistant steel (Cor-Ten)
   
   OR

B. Ductile iron of ASTM A536 specially alloyed and heat treated conforming to ANSI/AWWA Standard C111, A21.11.

**2.12 TIE RODS**

Tie rods and nuts for hydrant laterals, etc., shall be made of high strength, low alloy steel conforming to ANSI/AWWA C111 (Cor-Ten) unless specified otherwise in the plans or specifications.

**PART 3 INSTALLATION**

**3.1 HANDLING OF PIPE**

A. All types of pipe shall be handled in such a manner as will prevent damage to the pipe, pipe lining and coating. Dirt or other foreign matter shall be removed from pipe prior to joining.

B. The interior of the pipe shall be protected from the entrance of trench water at all times, maintaining pumps at the bell holes, if necessary, until the joints are made up.

C. At times when pipe lying is not in progress, the open ends of the installed pipe shall be closed by a water tight plug or by other means approved by the engineer to ensure absolute cleanliness inside the pipe.

D. New section of the system to be disinfected shall be flushed to remove all soils or contaminated material that may have become lodged in the pipe.

E. While under test pressure, the entire installation shall be carefully examined for defective materials and joint leaks.

**3.2 CONSTRUCTION DETAILS - PIPE INSTALLATION**

A. Proper and suitable tool and appliances for safe and convenient handling and laying of pipe and fittings shall be used. Great care shall be taken to prevent the pipe coatings from being damaged, particularly cement mortar lining on the inside of ductile iron pipe and fittings.

B. All pipe and fittings shall be carefully examined by the contractor for defects just before laying, and no pipe or fitting shall be laid which is defective. If any defective pipe or fitting is discovered after having been laid shall be removed and replaced in a satisfactory manner with sound pipe or fitting by the contractor at their expense.

C. All pipes and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until they are used in the completed work. Open ends of pipe shall be kept plugged with a bulkhead during construction.
D. Pipe laid in trenches shall be laid true to line and grade on a firm and even bearing for its full length at depths and grades as shown on drawings. Installation of HDPE and Ductile iron pipe in underground pressure piping system shall conform to the requirements of AWWA C600.

E. Buried HDPE pipe and fittings shall be installed in accordance with ASTM D2321 or ASTM D2774 for pressure systems and AWWA Manual of Practice M55 Chapter 7.

1. Contractor shall have minimum five (5) years’ experience installing HDPE pressure pipe and fittings for at least the specified pipe and fittings sizes and lengths and shall be able to submit documents of at least five (5) installations in satisfactory operation for at least five (5) years.

F. Lay HDPE pipe with blue stripe within 45-degree either side of the crown, if the pipe has a blue stripe.

G. Excavate and backfill trenches in accordance with the plans and specifications. Compact backfill per ASTM D98 and AASHTO T-99 to 95% maximum density within roadway. Compact top 12-inches below road subgrade to 100% of maximum density within the roadway.

H. Revision of pipe alignment and/or grade may be required by inspector in the field should obstructions or unsuitable conditions be encountered, or an obviously more suitable location is evident.

I. Bedding material shall be placed along the full length of each pipe section ensuring proper grade and alignment is maintained. No support blocking shall be used.

J. Any foreign matter in the gasket seat shall be removed, the gasket shall be wiped clean, flexed, inserted in the socket, and lubricated in accordance with the manufacturer’s recommendations.

K. Mechanical joint fittings/pipe shall be installed and the bolts tightened in the sequence and to the torque specified in A Guide for the Installation of Ductile Iron Pipe published by the Ductile Iron Pipe Research, and as indicated by manufacturer as acceptable.

L. At the close of each operating day, when the work is stopped for more than thirty (30) minutes, or when the trench is unsupervised:

1. Keep the pipe clean and free of debris, dirt, animals and trash – during and after the laying operation.

2. Effectively seal the open end of the pipe using a gasketed night cap.

3.3 JOINING METHODS

A. MECHANICAL JOINTS

1. Mechanical joints shall consist of a bold joint of the stuffing box type as detailed in ANSI A21.10 and described in ANSI A21.11.

2. Mechanical joints shall be thoroughly bolted in accordance with the manufacturer’s recommendations with Tee Head bolts and bolts of high strength, heat treated cast iron containing 0.50-percent copper or high strength low-allow steel having a minimum yield point strength of 40,00-psi and ultimate tensile strength of 70-00-psi.

3. Gaskets, bolts and nuts shall conform to ANSI A21.11. Gaskets shall be of neoprene or rubber of such quality that they will not be damaged by the liquid or gases with which they will come into contact.
4. Glands of ductile iron shall be of high strength ductile iron, and glands for cast iron shall be of high strength cast iron.

B. FLANGED JOINTS

1. Flanged joints shall conform to ANSI B16.1, Class 125, and in accordance with table 10.23 of ANSI A21.10.

2. Flanged joints shall be bolted with through stud or tap bolts of required size as directed. Bolts and nuts shall conform in dimensions to the American Standard heavy series. Nuts shall be hexagonal, cold pressed. Bolts and nuts shall be cadmium plated, cold pressed, steel machine bolts conforming to ASTM A307, Grade B. Cadmium plating shall be by an approved process and shall be between 0.003 to 0.0005-inch thick. After each joint has been made, all bolts, heads and nuts shall be coated with two coats of heavy asphaltum or other approved coating.

3. Gaskets of “Cranite”, red rubber, asbestos composition, or other approved quality shall be used in all flanged joints. Gaskets shall conform to the requirements of ANSI B16.21.

4. Where tap or stud bolts are required, flanges shall be drilled and tapped accordingly.

C. HDPE JOINTS

1. Butt heat fusion joints
   a. Shall be allowed for joining lengths of pipe in a straight run only.
   b. Shall conform to ASTM F2620 and PPI TR-33.
   c. Joint strength shall be equal to or greater than the strength of the pipe.

2. Electrofusion Couplings.
   a. Electrofusion couplings shall contain heating coils located at the sealing surface.

3. Fused Mechanical Joint (MJ) Adapters
   a. Use MJ adapter to connect HDPE pipe to ductile iron fittings and valves.
   b. Provide MJ adapters with kit, manufactured in accordance with ASTM D3261. The adapter shall consist of the following:
      1) Molded HDPE MJ transition fitting.
      2) Rubber gasket
      3) MJ backup ring
      4) Corrosion resistant – Cor blue bolts and nuts
   c. Fused MJ adapters shall have a pressure rating equal to the pipe unless noted otherwise.

3.4 GATE VALVE INSTALLATION

A. GATE VALVE

1. All gate valves shall be inspected to ensure proper working order prior to installation.

2. Where valve coating has been damaged, the contractor shall scrape off the damaged area and clean to expose the iron, then recoated with a supplier recommended coating system, or approved other.

3. Valves shall be installed vertically plumb with a standard valve chamber or cast-iron gate box arranged so that no loads will be transferred to the valve.
3.5 VALVE BOX INSTALLATION

1. Cast iron valve boxes shall be set during backfilling operations. No valve shall remain buried during construction.

2. Boxes shall be vertically plumb centered and aligned with operating stem of valve.

3. The lower casting installed is to be supported by compacted backfill and two (2) concrete brick to form a support base.

4. The casting shall not rest directly upon the body of the gate valve or upon the water main.

5. In roadways, the valve boxes shall be set to grade and be supported by a concrete pad.

6. Backfill around both units shall be placed by hand and compacted.

3.6 COMBINATION AIR/VACUUM RELEASE VALVE

Non-removable combination air and vacuum release valve shall be installed by the contractor as shown on the plans.

3.7 TESTING

A. Upon completion of each valved section, all points where pressure reaction and movement may occur shall be properly anchored, braced or shackled prior to pressure testing.

B. Upon completion of the distribution system or the individual zones, the line shall be filled slowly by the inspector and a pressure test conducted for a minimum duration of twenty-four (24) hours. The test pressure shall be 225 psi for two (2) hours. There shall not be any appreciable or abrupt loss in pressure during the test period. The allowable leakage shall be as specified in American Water Works Association (AWWA) M41-Ductile Iron Pipe-Design and Installation. To reduce the length of open trenches and the subsequent impact of following the specified environmental plan, the contractor will have the option to pressure test the individual distribution zones prior to backfilling the trench or waiting until the entire system is completed and backfilled prior to conducting the pressure test.

C. Contractor shall furnish and assemble all testing equipment including measuring devices and shall furnish all labor required for testing.

D. While under test pressure, the entire installation shall be carefully examined for defective material and joint tasks. Test pressure shall not be applied to the newly installed water main unless the inspector is present.

E. If the distribution system or individual zones fail the pressure testing, the contractor shall be required to locate the leak and make all necessary repairs prior to retesting.

F. Defective material furnished by the Contractor or furnished in good condition by the City and damaged after acceptance by the Contractor shall be replaced by the Contractor at their own expense.

G. Defective material furnished by the City and discovered before final acceptance will be replaced with sound material by the City, but the Contractor shall remove the effective material and install the new material at their own expense.

H. If necessary to replace defective material, the pressure test shall be rerun after such replacement.
3.8 **DISINFECTION**

1. When laying distribution pipe lines, care shall be taken to insure that the interior of the pipe is kept free of foreign matter or trench water.

2. The contractor shall place dry calcium hypochlorite into the pipe as the individual sections are installed in a quantity sufficient to produce a chlorine residual of no less than 10 ppm in the filled line after the required 24-hour retention period.

3. The inspector may require the Contractor to swab the inside of each pipe length with a chlorine solution prior to laying the pipe. The requirement will depend upon the time of year, usually May through September, or condition of piping interior.

3.9 **FIRE HYDRANTS**

A. All hydrant barrels shall have a flange located 2-inches above the finished grade line.

B. All hydrants shall be positioned so that the “pumper” fitting facing roadway access.

C. The hydrant barrel shall be protected from freezing by having positive drains in the flange. Place one-half cubic yard of washed rock below the barrel drains.

D. Any coated surfaces that are damaged shall be spot painted with asphalt varnish or an approved alternate coating by the Contractor prior to backfilling.

3.10 **SERVICE CONNECTIONS**

A. In general and unless noted otherwise, small 1 1/2-inch service lines and branches shall connect to larger 8-inch HDPE mains using electrofusion saddle and tapping tee.

B. Tapped tees and service connections shall have ball valve and valve box installed in accordance with the plans and specification.

3.11 **FIELD QUALITY CONTROL**

A. Do not enclose, cover, or put into operation water distribution piping system until it has been inspected and approved by the authority having jurisdiction.

B. Perform tests specified below in the presence of the plumbing official:

1. Final Inspection: Arrange for a final inspection by the plumbing official to observe the tests specified below and to ensure compliance with the requirements of the plumbing code.

2. Re-inspections: Whenever the plumbing official finds that the piping system will not pass the test or inspection, make the required corrections and arrange for re-inspection by the plumbing official.

3. Prepare inspection reports signed by the plumbing official.

C. Test water distribution piping as follows:

1. Test for leaks and defects in all new water distribution piping systems and parts of existing systems that have been altered, extended or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.

2. Leave uncovered and unconcealed all new, altered, extended, or replaced water distribution piping until it has been tested and approved. Expose all such work for testing that has been covered or concealed before it has been tested and approved.
3. Cap and subject the piping system to a static water pressure of 50-psi above the operating pressure without exceeding the pressure rating of the piping system materials. Isolate the test source and allow to stand for four (4) hours. Leaks and loss in test pressure constitute defects that must be repaired.

4. Repair all leaks and defects with new materials and restart system or portion thereof until satisfactory results are obtained.

5. Prepare reports for all tests and required corrective action.

END OF SECTION
SECTION 02675 - DISINFECTION OF WATER SUPPLY AND DISTRIBUTION SYSTEMS - PRESSURIZATION AND DISINFECTION

PART 1 GENERAL - HYDROSTATIC PRESSURE TEST

1.1 SECTION INCLUDES

The work under this section shall include all work to disinfect the water supply and distribution system.

Testing of all new water mains and appurtenances will only be accomplished with the approval and in presence of the Tacoma Power Construction Inspector. The Construction Inspector will provide his/her own set of gauges. Testing will conform to DIPRA Standards.

A. Upon completion of each valved section, all points where pressure reaction and movement may occur shall be properly anchored, braced or shackled prior to pressure testing.

B. Upon completion of the distribution system or the individual zones, the line shall be filled slowly by the contractor under the direction of the engineer and a pressure test conducted for a minimum duration of twenty-four (24) hours. The test pressure shall be 175 psi for two (2) hours. There shall not be any appreciable or abrupt loss in pressure during the test period. The allowable leakage shall be as specified in American Water Works Association (AWWA) M41- Ductile Iron Pipe-Design and Installation.

C. Contractor shall furnish and assemble all testing equipment including measuring devices and shall furnish all labor required for testing.

D. The City will furnish test gages.

E. While under test pressure, the entire installation shall be carefully examined for defective material and joint tasks. Test pressure shall not be applied to the newly installed water main unless the inspector is present.

F. If the distribution system or individual zones fail the pressure testing, the contractor shall be required to locate the leak and make all necessary repairs prior to retesting.

G. Defective material furnished by the City and discovered before final acceptance will be replaced with sound material by the City, but the Contractor shall remove the effective material and install the new material at their own expense.

PART 2 PRODUCTS - DISINFECTION OF WATER MAINS

2.1 DISINFECTION CHEMICALS

50 ppm of chlorine in accordance with APWA 74-2.13.

2.1. FLUSHING

In laying mains, care shall be taken to insure that the interior of the pipe is kept free of foreign matter or trench water. Upon completion of construction, the line shall be filled by Tacoma Power crews.

Tacoma Power crews will flush, sample and de-chlorinate newly installed water mains. The Contractor is advised that only Tacoma Power crews shall operate system valves.
Water for testing and sterilizing will be furnished without charge to the Contractor at such points as may be designated by the Inspector, in such quantities and at such times as will not interfere with service to Tacoma Power Customers.

2.2 RETENTION PERIOD FLUSHING

The chlorinated water resulting from the initial filling shall be retained in the line for a period of not less than twenty four (24) hours. After this period the chlorine residual at the pipe extremities and at other representative points shall be at least 25 p.p.m. After which Tacoma Power will remove the chlorinated water and thoroughly flush the line. Tacoma Power shall take initial bacterial test samples of water flowing in the line upon completion of the flushing.

A second set of bacterial test samples will be taken after a twenty four (24) hour retention period of the water remaining in the pipe after the initial flushing. Should the samples not test free of E.coli and zero coliform bacteria, the line shall be re-disinfected and re-flushed, at the expense of the Contractor, until two successive satisfactory samples are obtained.

Forty eight (48) hours is the minimum time required by the bacteriological laboratory to process samples.

2.3. FINAL FLUSHING AND TESTING

The Tacoma Power Construction Inspector will determine location of sample stations and coordinate with Contractor crews for installation. Corporation stops with copper pipe stubs will be installed by Contractor crews at selected points along the pipeline for use as sampling stations and points to release air, and apply test pressure.

The sampling stations will be removed by the Contractor crews after bacterial tests and pressure tests are completed. Installation and removal of sample stations will be coordinated with the Contractor. The water main contractor shall complete any excavation required for installation and/or removal of the sample stations. The cost of all labor, equipment and materials involved in the installation and removal of sample stations shall be included in the various bid items of the contract or otherwise incidental to the contract.

PART 3 EXECUTION MEASUREMENT

3.1 CONSTRUCTION DETAILS

A. This contract shall include disinfecting and testing the entire completed water system to ensure it meets all state and local water system regulations for a Class A "Transient" system. All work shall be as required by the Washington State Department of Health, Division of Drinking Water for such systems.

B. New sections of the system to be disinfected shall first be flushed at a minimum velocity of 5-feet per second to remove all soils or contaminated material that may have become lodged in the pipe.

C. While under test pressure, the entire installation shall be carefully examined for defective materials and joint leaks.
D. The chlorine mixture shall be inserted into the system in a manner which will ensure uniform distribution of the mixture. After the disinfection is completed, this concentrated chlorine mixture shall be flushed from the system at its extremities until the replacement water through the system shows the normal (0.2 ppm) of chlorine.

E. The contractor shall furnish all labor and materials necessary to flush, disinfect, and test the system. Notify engineer 48 hours prior to beginning.

_Trench Shoring – The Measurement of shoring will be by the linear foot of pipe laid and shall be measured along the pipe through fittings, valves and couplings. The single lineal foot measurement will be for both sides of the trench that is shored. Over-excavation to bypass the use of shoring/shielding is not considered a safety system and no payment will be made. Any extra quantities materials (pavement removal and replacement, trench excavation and disposal, trench backfill) attributed to over-excavation will not be paid for by Tacoma Power. Shoring/shielding requirements will be in accordance with WISHA standards and the 2016 M41-10 Washington State Department of Transportation Standard Specifications Section 7-09.3(7). In areas where the existing AC main is removed and the new main is installed on the same alignment._
B. MATERIAL QUALITY

Provide manufacturer’s best quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint material containers not displaying manufacturer’s product identification will not be acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Arrange for required lighting, temporary heat, and ventilation.

3.2 MATERIALS NOT TO BE FINISHED

The following receive no finish except as specifically indicated:

A. METALS AS LISTED
   1. Brass, bronze, copper, stainless steel, pre-finished metal and plated metals other than galvanized metal.
   B. Plastic laminate surfacing.
   C. Glass, unless otherwise noted.
   D. Materials having complete factory finish, such as electrical switch plates, lighting fixtures, finish hardware, and the like.

   NOTE: Surface mounted wiring raceways and other such normally prefinished items, mounted on walls scheduled for painting shall be painted out to match wall.

E. Fabrics, plastics, tackboards, and other normally unfinished materials unless otherwise indicated.

F. Inaccessible materials permanently enclosed behind building construction and structural components

3.3 OTHER TRADES

Unless otherwise indicated, following surfaces are the responsibility of other trades

A. Shop primer coats of metal fabrications: Includes miscellaneous metals, sheet metal, and other shop prime coated metal items, except for minimal spot touch-up surfaces abraded during installation.

B. Finish of substrates, specified in other sections.

3.4 EXTERIOR PAINT

A. FERROUS METAL

Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.

1. Two (2) finish coats over a rust-inhibitive primer.

**B. GALVANIZED METAL**

Provide the following finish systems over exterior galvanized metal surfaces.

1. Two (2) finish coats over a rust-inhibitive primer.
   


**3.5 APPLICATION (EXTERIOR/INTERIOR)**

A. Perform work in accordance with contract documents, references, codes, and manufacturer's instructions. Where these may be in conflict, the more stringent requirements govern.

1. Minimum two (2) finish coat applications over prepared and primed substrates unless specifically indicated otherwise. Apply more coats as required to completely cover holidays or color irregularities.

B. Apply paint and other finish by methods generally accepted by the trade to achieve approved finishes.

1. Do not apply finishes on surfaces until sufficiently prepared and dry.
2. Include as many coats as necessary for complete coverage and acceptable appearance, but not less than number of applications indicated.
3. Consult referenced Steel Structures Painting Council (SSPC) for surfaces not specifically mentioned in this section. Confirm with engineer.

C. Film thickness tests: Verify mil thickness by use of a suitable wet film gauge. Test surfaces using Tooke, or approved dry film gauge.

**3.6 APPLICATION - SURFACE PRIMER (EXTERIOR)**

A. All areas shall receive an application of a surface primer.

B. Surface primers used shall be recommended by the topcoat manufacturer for exterior use.

C. Primers will be applied at the recommended wet film/dry film thickness, and at the appropriate time to observe the recoat window of minimum and maximum drying times before top coating. Do not apply the primer if rain is forecast within four (4) hours.

D. All materials, primer and topcoat, shall be applied by roller or brush. To achieve the proper coverage several applications may be required. Spraying will not be allowed due to the proximity of employee and City vehicles.
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Addendum #1

Revision Date - 2/14/2020
## 2020 Tacoma Power Prequalified Electrical Contractors List

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*Revision Date - 2/14/2020*
## 2020 Tacoma Power Prequalified Electrical Contractors List

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