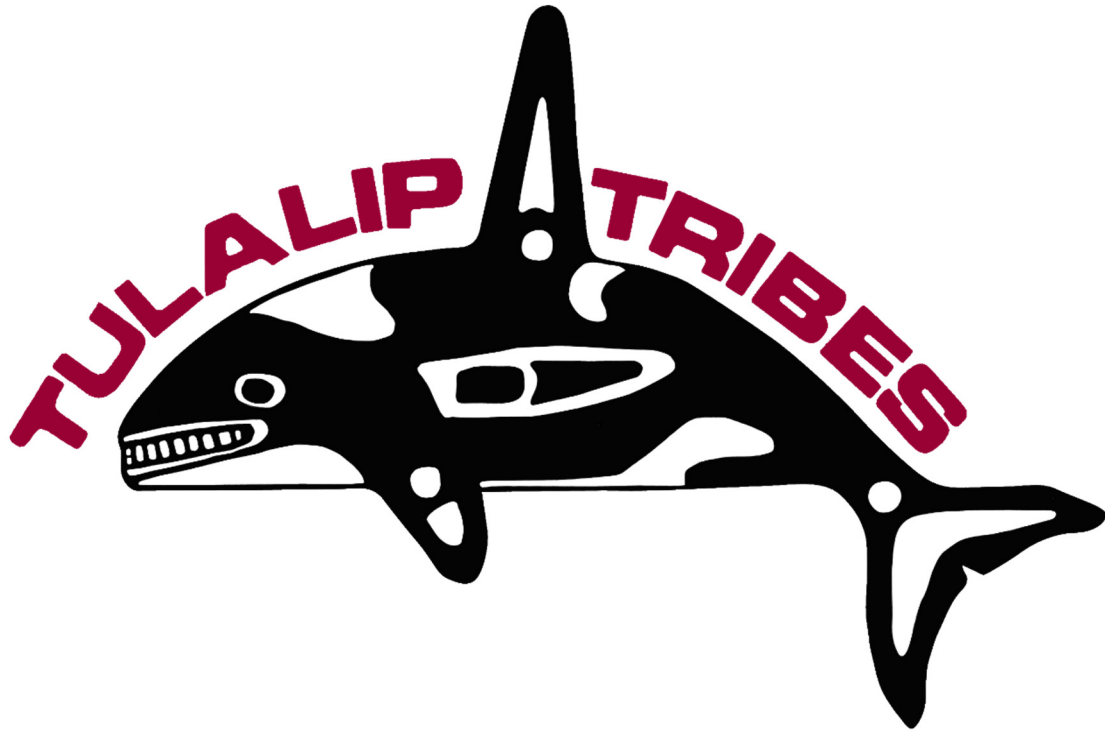


The Tulalip Tribes of Washington



MBR Treatment Facility Upgrade

Bid Solicitation No. 17-004

**Contract Documents
Divisions 0 through 22**

February 2018

Volume 1 of 3

MBR TREATMENT FACILITY UPGRADE

Bid Solicitation No. 17-004

Contract Documents

Prepared for

The Tulalip Tribes
8802 27th Avenue NE
Tulalip, WA 98271-9694

Prepared by

Parametrix
1019 39th Ave SE Suite 100
Puyallup, WA 98374
253-604-6600
www.parametrix.com

February 2018

CITATION

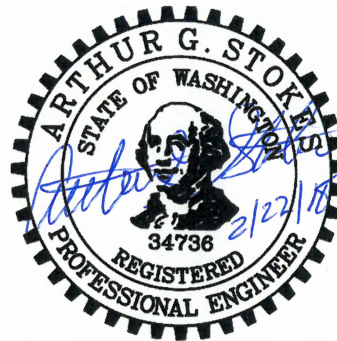
Parametrix. 2018. MBR Treatment Facility Upgrade
Contract Documents
Prepared by Parametrix, Puyallup, Washington.
February 2018.

CERTIFICATION

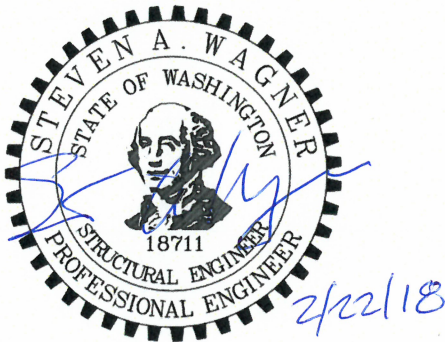
The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



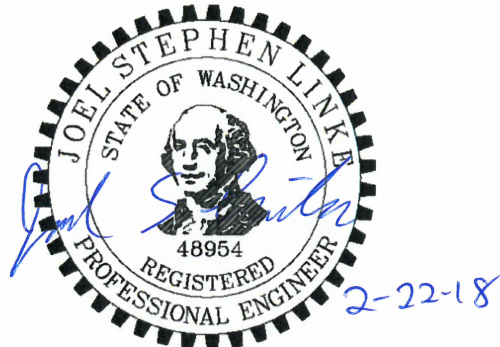
Prepared by Allan C. Maas, P.E.
(Divisions 01, 02, 09, 22 except sections
prepared by others, 46)



Prepared by Arthur G. Stokes, P.E.
(Divisions 26, 40)



Prepared by Steven A. Wagner, P.E.
(Divisions 03, 05, 08, 13, Section 41 22 23)

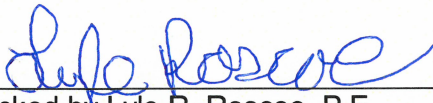


Prepared by Joel S. Linke, P.E.
(Sections 22 13 29, 22 13 39, 22 13 49)

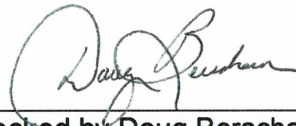
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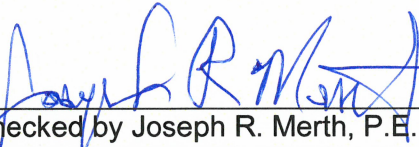
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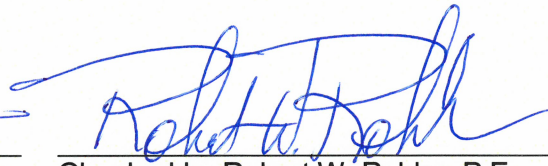
Checked by Lyle R. Roscoe, P.E.
(Sections 01 01 00, 01 01 01, 01 10 00,
01 12 00, 01 12 16, 01 29 00, 01 45 24,
01 45 25, 01 74 23 and Divisions 09, 22, 46)



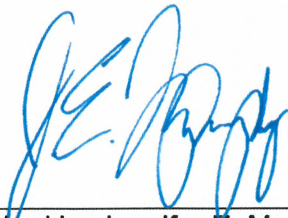
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(Divisions 01, 02)



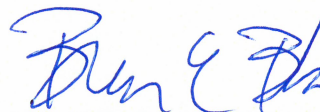
Checked by Joseph R. Merth, P.E.
(Divisions 03, 05, 08, 13, 41)



Checked by Robert W. Rohler, P.E.
(Divisions 26, 40 except sections checked by
others)



Checked by Jennifer E. Murphy, P.E., C.S.E.
(Sections 40 68 13, 40 70 00, 40 70 10,
40 94 33)



Approved by Brian E. Bunker, P.E.

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Division 0

Bidding Requirements, Contract Forms, and Conditions of Contract



The Tulalip Tribes of Washington

Notice to Bidders

Sealed bid proposals will be received by The Tulalip Tribes of Washington, at the Consolidated Borough of Quil Ceda Village's Office located at 8802 27th Avenue NE, Tulalip, Washington 98271-9694 for the following Project:

BID SOLICITATION NUMBER 17-004

MBR Treatment Facility Upgrade

in accordance with the Drawings and Specifications prepared by:

Parametrix
1019 39th Avenue SE, Suite 100
Puyallup, WA 98374
253-604-6600

The Construction Manager for the Project is:

The Tulalip Tribes of Washington
8802 27th Avenue NE
Tulalip, WA 98271-9694
Attn: Mr. Lukas Reyes 360-716-5022 lreyes@tulaliptribes-nsn.gov

This Tulalip Tribes project provides for the improvement of their Membrane Bioreactor (MBR) Wastewater Treatment Plant (WWTP). The construction of this project includes:

1. Supply and installation of a headworks drum screen.
2. Supply and installation of two blowers, sanitary sewer piping, and supports.
3. Supply and installation of Kubota submerged membrane units (SMUs) in MBR tanks. Supply includes all piping up to and including air and permeate 2-inch isolation valves.
4. Stainless steel and ductile iron pipe supply and installation.
5. Supply and installation of electrical motor control center (MCC), duct banks, conduit, and fiber optic cable.
6. All incidental and related work to complete.

This project has been separated into two bid schedules. The delineation of what is included in these schedules is made on the Contract Drawings. Schedule A generally includes construction at the Headworks Building and between MBR Building and other buildings. Schedule B generally includes construction in the MBR Building and MBR tanks. The lowest responsive and responsible bid price shall be determined by the Tribes. This determination will be made based on what Schedule or combination of Schedules is best for the Tribes. Award schedule for Schedule A shall be based on these Contract Documents. The schedule for award for Schedule B (if awarded) is anticipated to be September 14, 2018. If this award is delayed by 12 months or less, the Schedule B bid price shall be inflated based on the percent ENR Seattle Construction Cost index change from September 2018 to the month of Schedule B award. If the award is delayed more than 12 months,

the Contractor and Tribes shall negotiate a new price, but the Tribes also reserve the right to cancel the Schedule B part of the contract at any time. To receive NAOB subcontractor weighting, NAOB subcontractors must be included in Schedule A and Schedule B work.

All work to be in accordance with the Contract Plans, these Contract Provisions, and the Standard Specifications.

Any Proposed Equal for a Standard shall be submitted to the Construction Manager no later than ten (10) days prior to the bid opening. If no Addendum is issued accepting the Proposed Equal, the Proposed Equal shall be considered rejected.

Native American Preference related to contracting, subcontracting, and suppliers in the project is required. Bidders shall abide by The Tulalip Code, Chapter 9.05 – TERO Code which provides Indian preference in contracting goods and services. Additionally, The Tulalip Tribes' Board of Directors has the authority to require those employers subject to The Tulalip Code, Chapter 9.05 – TERO Code and applicable federal laws and guidelines, to give preference to Indians in hiring, promotions, training, and all other aspects of employment. Bidders shall comply with this Code and the rules, regulations, and orders of the TERO Commission. For more information about The Tulalip Code, Chapter 9.05 – TERO Code, contact The Tulalip Tribes' TERO Department at 6406 Marine Drive, Tulalip, Washington 98271, Office (360) 716-4747 or Facsimile (360) 716-0249. The Tulalip TERO Code is available for review on the Tulalip TERO website: <http://www.tulaliptero.com/>. Sealed bids will be received for: until _____, at which time, all bids will be opened and read aloud. All required bid documentation shall be submitted to the front desk receptionist at the QCV – Administrative Office located at 8802 27th Avenue NE, Tulalip, WA by the scheduled bid date and times. ORAL, TELEPHONIC, FAXED, OR TELEGRAPHIC BIDS WILL NOT BE ACCEPTED.

A mandatory pre-bid meeting will be held on _____, 2018, at 10:00 a.m. convening at the Quil Ceda Village Office located at 8802 27th Avenue NE, Tulalip, WA 98271. For their bids to be considered responsive, all general contractors intending to submit a proposal for this project are required to attend. The following is applicable to federal nexus projects:

The Tulalip Tribes in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, subtitle A, Office of the Secretary, Part 21, nondiscrimination in federally assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color or national origin in consideration for an award.

All pre-bid questions and clarifications should be made in writing to the Construction Manager no later than five (5) working days prior to bid opening. Any and all such clarifications and any supplemental instructions will be in the form of written addenda, if issued or responded to. Be sure to include in the address of the correspondence the words "PRE-BID QUESTION".

The bid documents may also be reviewed for bidding purposes by the following means and methods:

1. On the Internet – Free of Charge:

Plans, specifications, addenda, bidders list, and plan holders list for this project are available through the Consolidated Borough of Quil Ceda Village – Tulalip Tribes' online plan room. Free of charge access is provided to Prime Bidders, Subcontractors, and Vendors by going to: <http://www.quilcedavillage.org> and clicking on: **"Government"** then **"Project**

Management” then scroll to the heading **“Tulalip Tribes Bidding Opportunities”**. This online plan room provides Bidders with fully usable online documents; with the ability to download and print to your own printer. Contact The Tribes’ Construction Manager listed above should you require assistance.

Plans, Specifications, Addenda, Bidders List, and Plan Holders List for this project are also available through the Consolidated Borough of Quil Ceda Village – Tulalip Tribes’ online plan room with Builders Exchange of Washington. Free of charge access is provided to Prime Bidders, Subcontractors, and Vendors by going to: **“<http://bxwa.com>”** and clicking on: **“Posted Projects”**; **“Public Works”**, **“Tribal Agencies”**, **“Consolidated Borough of Quil Ceda Village – Tulalip Tribes”**, and **“Projects Bidding”**. Bidders are encouraged to “Register” in order to receive automatic email notification of future addenda and to place themselves on the self-registered “Bidders List”. This online plan room provides Bidders with fully usable online documents; with the ability to: download, print to your own printer, order full/partial plan sets from numerous reprographic sources (online print order form), and a free online digitizer/take-off tool. Contact Builders Exchange of Washington at 425-258-1303 should you require assistance.

2. For review at the following locations during normal business hours:

Consolidated Borough of Quil Ceda Village
8802 27th Avenue NE
Tulalip, WA 98271-9694
(360) 716-5024 office

Builders Exchange of Washington, Inc.
2607 Wetmore Avenue
Everett, WA 98201
<http://www.bxwa.com>
(425) 258-1303 office
(425) 259-3832 facsimile

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The Tulalip Tribes of Washington

CONFIDENTIALITY AGREEMENT

Upon award of a Contract the successful Bidder shall provide the Tulalip Tribes of Washington with a completed and signed Confidentiality Agreement as set forth herein. Successful Bidder shall also provide the Tulalip Tribes of Washington with a Confidentiality Agreement Completed and signed by all lower tier contractors and/or suppliers whom may perform Work on the Project.

I / we, the undersigned, have been provided certain confidential and proprietary information ("Confidential Information") regarding the Tulalip Tribes of Washington for the Project identified as MBR Treatment Facility Upgrade ("Project"). "Confidential Information" shall include, without limitation, all financial information, data, materials, products, manuals, business plans, marketing plans, Project design documents, or other information disclosed or submitted orally, in writing, or by any other media.

The undersigned acknowledges that this Confidential Information is sensitive and confidential in nature, and that the disclosure of this information to anyone not part of this agreement would be damaging to the Tulalip Tribes of Washington.

In consideration of the premises herein contained, I / we understand and agree that I / we will not disclose any "Confidential Information" regarding this "Project" to any person(s) not privy to this agreement. Furthermore, I / we will not disclose any of this information directly or indirectly to any competitor of the Tulalip Tribes of Washington.

Agreed to and accepted:

Signature: _____

Title: _____

Printed Name: _____

DATE: _____

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The Tulalip Tribes of Washington

INSTRUCTIONS TO BIDDERS

The Tulalip Tribes of Washington hereby invite you to submit a Bid Proposal for this project.

Article 1	Contract Information
Article 2	Bidding Procedures
Article 3	Bid Opening & Consideration of Bids
Article 4	Withdrawal of Bid
Article 5	Bid Estimate
Article 6	Bid Guaranty and Contract Bond
Article 7	Contract Award and Execution
Article 8	Applicable Law and Forum

ARTICLE 1 – CONTRACT INFORMATION

1.1 PROJECT BID REQUIREMENTS

- 1.1.1 The Tulalip Tribes of Washington's Board of Directors has the authority to require those employers subject to The Tulalip Code, Chapter 9.05 – TERO Code and applicable federal laws and guidelines, to give preference to Indians in hiring promotions, training and all other aspects of employment contracting and subcontracting, and to give preference to Indians in contracting goods and services. Bidders must comply with The Tulalip Code, Chapter 9.05 – TERO Code and the rules, regulations and orders of the TERO Commission.
- 1.1.2 With respect to each Project / Contract of \$10,000 or more, operating within the exterior boundaries of the Tulalip Reservation or on Tribal Projects off the Reservation, the Contractor shall pay a onetime Fee of 1.75% of the total Project / Contract cost, i.e., equipment labor, materials and operations and any increase of the Contract / Project or Subcontract amount. If the Contractor initially enters into a Contract of less than the \$10,000, but subsequent changes in the Work increases the total Contract / Project amount to \$10,000 or more, the TERO Fee shall apply to the total amount including increases.
- 1.1.3 The General Contractor shall be responsible for paying all TERO fees, including those attributable to the subcontractors. The fee shall be due in full prior to commencement of any work under the Contract / Project. However, where good cause is shown, the TERO Representative may authorize the General Contractor to pay said fee in installments over the course of the contract, when:
 - 1.1.3.1 The decision whether to authorize an alternative arrangement, which, if allowed, shall be in writing, shall rest solely with the discretion of the TERO Representative.
- 1.1.4 Whenever an employer or union would be required by any provision of The Tulalip Code, Chapter 9.05 – TERO Code to give preference in employment, such

preference shall be given to the following persons in the following enumerated order:

- a) Enrolled Tulalip Tribal Members
- b) Spouses, Parent of a tribal member child, biological child born to an enrolled Tulalip Tribal Member, current legal guardian of a Tribal Member dependent child (with a proper letter of temporary or permanent legal guardianship from a court), or a tribal member in a domestic partner relationship (with documentation).
- c) Other Natives/Indians shall mean any member of a federally recognized Indian tribe, nation or band, including members of federally recognized Alaskan Native villages or communities.
- d) Spouse of federally recognized Native American
- e) Regular current employees of the all Tulalip Tribal entities
- f) Other

Where prohibited by applicable Federal law or contractual agreements, the above order of preference shall not apply. In such cases, preference shall be given in accordance with the applicable Federal law or contract.

- 1.1.5 The preference requirements contained in The Tulalip Code, Chapter 9.05 – TERO Code shall be binding on all contractors and subcontractors, regardless of tier, and shall be deemed a part of all resulting contract agreements.
- 1.1.6 For more information about The Tulalip Code, Chapter 9.05 – TERO Code, contact the Tulalip Tribes' TERO Department at 6406 Marine Drive, Tulalip, Washington 98271, Office (360) 716-4747 or Facsimile (360) 716-0249. The Tulalip TERO Code is available for review on the Tulalip TERO website: <http://www.tulaliptero.com>.
- 1.1.7 The following requirements apply to the Bid Award Criteria and Procedures for the Project:
 - 1.1.7.1 Bidding is not restricted to certified Native American Owned Businesses.
 - 1.1.7.2 The Contract will be awarded based on the "Weight of Award" point system pursuant to paragraph IB 3.5.2.
 - 1.1.7.3 Minimum TERO Participation Requirements for Employment:
 - 1.1.7.3.1 A minimum of fifteen percent (15%) of the entire project work force and (15%) including each subcontractor shall be "Preferred Employees" as defined in The Tulalip Code, Chapter 9.05 – TERO Code.
 - 1.1.7.3.2 The total number of "Preferred Employees" employed by the Bidder, and those employed by its subcontractors shall be used to determine if Bidder satisfies the minimum requirement.
 - 1.1.7.3.3 Bidders are encouraged to exceed the minimum requirement for employment.

- 1.1.7.4 Minimum TERO Participation Requirements in contracting with Tulalip Tribal Member NAOB Subcontractors and Suppliers:
 - 1.1.7.4.1 Bidder shall contract with a minimum number of five (5) certified Tulalip Tribal Member NAOB firms with individual contract values greater than \$50,000 to be considered responsive and responsible.
 - 1.1.7.4.2 The total value of NAOB contracted work shall be a minimum of twenty percent (20%) of the total Bid Proposal Price, and the total value of Tulalip Tribal Member NAOB contracted work shall be a minimum of fifteen percent (15%) of the total Bid Proposal Price.
 - 1.1.7.4.3 Bidders are encouraged to exceed the minimum requirements for Tulalip Tribal Member NAOB Subcontractors and Suppliers.
 - 1.1.7.4.4 Bidders shall list their Tulalip Tribal Member NAOB Subcontractors and Suppliers on the Bid Form in Section IV A, pursuant to paragraph IB 3.5.6.
- 1.1.7.5 Minimum TERO Participation Requirements in contracting with NAOB Subcontractors and Suppliers:
 - 1.1.7.5.1 Bidders are encouraged to contract with NAOB Subcontractors and Suppliers.
 - 1.1.7.5.2 Bidders shall list their NAOB Subcontractors and Suppliers on the Bid Form in Section IV B, pursuant to paragraph IB 3.5.6.
- 1.1.7.6 Bidder shall be considered nonresponsive if they do not meet the minimum requirements contained in this paragraph IB 1.1.7.

1.2 NOT USED.

1.3 GIVING NOTICE

- 1.3.1 Whenever any provision of the Contract Documents requires the giving of notice, such notice shall be deemed to have been validly given if delivered personally to the individual or to a member of the entity for whom the notice is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address of such individual or entity known to the giver of the notice.
 - 1.3.1.1 All notices provided to the Bidder from the Construction Manager shall be copied to the Engineer.
 - 1.3.1.2 All notices provided to the Bidder from the Engineer shall be copied to the Construction Manager.
 - 1.3.1.3 All notices provided to the Engineer from the Bidder shall be copied to the Construction Manager.
 - 1.3.1.4 All notices provided to the Construction Manager from the Bidder shall be copied to the Engineer.
- 1.3.2 When any period of time is referred to in the Contract Documents by days, it shall be computed to exclude the first, and include the last, day of such period. If the last

day of any such period falls on a Saturday, Sunday, or a legal holiday, such day will be omitted from the computation and such period shall be deemed to end on the next succeeding day which is not a Saturday, Sunday, or legal holiday.

- 1.3.3 The effective date of any and all notices, regardless of the method of delivery, shall be the date of receipt.

1.4 USE OF FACSIMILE TRANSMISSION

- 1.4.1 Any notice required to be given by the Contract Documents may be given by facsimile transmission, provided the original signed notice is delivered pursuant to paragraph IB 1.3.1.
- 1.4.2 Notice of withdrawal of a bid may be given by facsimile transmission provided an original signed document is received within three (3) business days of the facsimile transmission.

ARTICLE 2 - BIDDING PROCEDURES

2.1 EXAMINATION OF CONTRACT DOCUMENTS AND PROJECT SITE

- 2.1.1 The Bidder shall examine all Contract Documents, including without limitation the Drawings and Specifications for all divisions of Work for the Project, noting particularly all requirements which will affect the Bidder's Work in any way. In addition, the Bidder must carefully examine all Contract Documents because laws and rules applicable to other Tribal projects are not necessarily applicable to this Project.
- 2.1.2 Failure of a Bidder to be acquainted with the extent and nature of Work required to complete any applicable portion of the Work, in conformity with all requirements of the Project as a whole wherever set forth in the Contract Documents, will not be considered as a basis for additional compensation.
- 2.1.3 The Bidder shall evaluate the Project site and related Project conditions where the Work will be performed, including without limitation the following:
- 2.1.3.1 The condition, layout and nature of the Project site and surrounding area;
 - 2.1.3.2 The availability and cost of labor;
 - 2.1.3.3 The availability and cost of materials, supplies and equipment;
 - 2.1.3.4 The cost of temporary utilities required in the bid;
 - 2.1.3.5 The cost of any permit or license required by a local or regional authority having jurisdiction over the Project;
 - 2.1.3.6 The generally prevailing climatic conditions;
 - 2.1.3.7 Conditions bearing upon transportation, disposal, handling, and storage of materials.
- 2.1.4 Unless otherwise specified in the Contract Documents, borings, test excavations and other subsurface information, if any, are provided solely to share information available to the Tulalip Tribes of Washington and any use of, or reliance upon, such items by the Bidder is at the risk of the Bidder. The Bidder shall be afforded access to the Project site to obtain the Bidder's own borings, test excavations and

other subsurface information upon request made to the Construction Manager not less than ten (10) days prior to the opening of the bids.

2.2 PRE-BID MEETING

- 2.2.1 The Bidder is required to attend pre-bid meeting, where the Engineer and the Construction Manager will answer questions regarding the Contract Documents.
- 2.2.2 The Construction Manager, with the assistance of the Engineer, shall prepare minutes of the pre-bid meeting for the Project record, which will be provided to a Bidder upon request.
- 2.2.3 Not Used.
- 2.2.4 The time and place of any pre-bid meeting to be held is included in the bid advertisement.

2.3 INTERPRETATION

- 2.3.1 If the Bidder finds any perceived ambiguity, conflict, error, omission or discrepancy on or between any of the Contract Documents, including without limitation the Drawings and Specifications, or between any of the Contract Documents and any applicable provision of law, including without limitation, the current International Building Code, the Bidder shall submit a written request to the Engineer, through the Construction Manager, for an interpretation or clarification.
 - 2.3.1.1 The Bidder shall be responsible for prompt delivery of such request.
 - 2.3.1.2 In order to prevent an extension of the bid opening, the Bidder is encouraged to make all requests for interpretation or clarification a minimum of seven (7) days before the bid opening.
- 2.3.2 If the Engineer determines that an interpretation or clarification is warranted, the Engineer shall issue an Addendum and the Construction Manager shall provide a copy to each person of record holding Contract Documents in accordance with paragraph IB 1.3. Any Addendum shall be deemed to have been validly given if it is delivered via facsimile, issued and mailed, or otherwise furnished to each person of record holding the Contract Documents. If any Addendum is issued within 72 hours prior to the published time for the bid opening, excluding Saturdays, Sundays and legal holidays, the bid opening shall automatically be extended one (1) week, with no further advertising required.
- 2.3.3 Any interpretation or clarification of the Contract Documents made by any person other than the Engineer, or in any manner other than a written Addendum, shall not be binding and the Bidder shall not rely upon any such interpretation or clarification.
- 2.3.4 The Bidder shall not, at any time after the execution of the Contract, be compensated for a claim alleging insufficient data, incomplete, ambiguous, conflicting or erroneous Contract Documents, any discrepancy on or between Contract Documents, or incorrectly assumed conditions regarding the nature or character of the Work, if no request for interpretation or clarification regarding such matter was made by the Bidder prior to the bid opening.

2.4 STANDARDS

- 2.4.1 The articles, devices, materials, equipment, forms of construction, fixtures and other items named in the Specifications to denote kind quality or performance

requirement shall be known as Standards and all bids shall be based upon those Standards.

- 2.4.2 Where two or more Standards are named, the Bidder may furnish any one of those Standards.

2.5 NOT USED.

2.6 BID FORM

- 2.6.1 Each bid shall be submitted on the Bid Form and sealed in an envelope clearly marked as containing a bid, indicating the Project name, the Contractor scope of work, and the date of the bid opening on the envelope.
- 2.6.1.1 Any change, alteration or addition in the wording of the Bid Form by a Bidder may cause the Bidder to be rejected as not responsible for award of a Contract.
- 2.6.1.2 Unless the Bidder withdraws the bid as provided in IB Article 4, the Bidder will be required to comply with all requirements of the Contract Documents, regardless of whether the Bidder had actual knowledge of the requirements and regardless of any statement or omission made by the Bidder which might indicate a contrary intention.
- 2.6.2 The Bidder shall fill in all relevant blank spaces in the Bid Form in ink or by typewriting and not in pencil.
- 2.6.2.1 The Bidder shall show bid amounts for the Total Base Bid and any Alternate(s) in both words and figures. In the case of a conflict between the words and figures, the amount shown in words shall govern, where such words are not ambiguous. When the Bidder's intention and the meaning of the words are clear, omissions or misspellings of words will not render the words ambiguous.
- 2.6.2.2 Any alteration or erasure of items filled in on the Bid Form shall be initialed by the Bidder in ink.
- 2.6.3 When an Alternate is listed on the Bid Form, the Bidder shall fill in the applicable blank with an increased or decreased bid amount. The Tulalip Tribes of Washington reserves the right to accept or reject any or all bids on Alternates, in whole or in part, and in any order. Voluntary Alternates submitted by a Bidder are prohibited from becoming the basis of the Contract award.
- 2.6.3.1 If no change in the bid amount is required, indicate "No Change" or "\$0 dollars".
- 2.6.3.2 Failure to make an entry or an entry of "No Bid," "N/A," or similar entry for any Alternate by a Bidder may cause the Bidder to be rejected as nonresponsive only if that Alternate is selected.
- 2.6.3.3 If an Alternate is not selected, an entry by a Bidder as listed in paragraph IB 2.6.3.2 on that Alternate will not, by itself, render a Bidder nonresponsive.
- 2.6.3.4 In a combined bid, a blank entry or an entry of "No Bid," "N/A," or similar entry on an Alternate will cause the bid to be rejected as nonresponsive

only if that Alternate applies to the combined bid and that Alternate is selected.

- 2.6.4 Each bid shall contain the name of every person interested therein. If the Bidder is a corporation, partnership, sole proprietorship, or limited liability company, an officer, partner or principal of the Bidder, as applicable, shall print or type the legal name of the Bidder on the line provided and sign the Bid Form. If the Bidder is a joint venture, an officer, partner or principal, as applicable, of each member of the joint venture shall print or type the legal name of the applicable member on the line provided and sign the Bid Form on behalf of that member. All signatures must be original.
- 2.6.5 Subject to the provisions of this paragraph IB 2.6, the completed Bid Form of the Bidder with whom the Tulalip Tribes of Washington executes a Contract Form shall be incorporated into the Contract Form as if fully rewritten therein.

2.7 REQUIRED SUBMITTALS WITH BID FORM

- 2.7.1 A Bidder shall be rejected as nonresponsive if the Bidder fails to submit the following submittals with the Bid Form in a sealed envelope:
- 2.7.1.1 If the Bid is restricted to certified Tulalip Tribal Member NAOBs or NAOBs, then Bidder shall submit evidence of certification from the Tulalip Tribes' TERO office as being a certified NAOB for the identified NAOB category.
- 2.7.1.2 A Bid Guaranty as provided in paragraph IB 6.1.
- 2.7.1.3 A Power of Attorney of the agent signing for a Surety which is licensed in Washington, when a Bid Guaranty and Contract Bond is submitted.
- 2.7.1.4 Native American Owned Business Written Confirmation Documentation for each Tulalip Tribal Member NAOB and NAOB firm listed on the Bidder's Bid Form.
- 2.7.1.5 Schedule of major Equipment – Basis of Bid in Section 01 01 00.
- 2.7.1.6 Subcontractor List.

2.8 UNIT PRICES

- 2.8.1 When Unit Prices are requested on the Bid Form, the scheduled quantities listed are to be considered as approximate and are to be used only for the comparison of bids for purposes of award of the Contract and to determine the maximum quantity to be provided without a Change Order. If Unit Prices are stated to be sought only for informational purposes, they shall not be used for comparison of bids.
- 2.8.2 Unless otherwise specified in the Contract Documents, the Unit Prices set forth shall include all materials, equipment, labor, delivery, installation, overhead, profit and any other cost or expense, in connection with or incidental to, the performance of that portion of the Work to which the Unit Prices apply. The Bidder shall submit Unit Prices for all items listed unless other instructions are stated on the Bid Form.
- 2.8.3 Where there is a conflict between a Unit Price and the extension thereof made by the Bidder, the Unit Price shall govern and a corrected extension of such Unit Price shall be made and such corrected extension shall be used for the comparison of

the bids and to determine the maximum quantity to be provided without a Change Order.

- 2.8.4 The Bidder agrees that the Tulalip Tribes of Washington may increase, decrease or delete entirely the scheduled quantities of Work to be done and materials to be furnished after execution of the Contract Form.
- 2.8.5 Payments, except for lump sum items in Unit Price Contracts, will be made to the Contractor only for the actual quantities of Work performed or materials furnished in accordance with the Contract Documents.
- 2.8.6 If the cost of an item for which a Unit Price is stated in the Contract changes substantially so that application of the Unit Price to the quantities of Work proposed will create an undue hardship on the Tulalip Tribes of Washington or the Contractor, the applicable Unit Price may be equitably adjusted by Change Order.

2.9 CHANGE IN THE BID AMOUNT

- 2.9.1 Any change to a previously submitted bid shall be made in writing and must be received by the Tulalip Tribes of Washington before the time scheduled for the bid opening, as determined by the employee or agent of the Tulalip Tribes of Washington designated to open the bids.
- 2.9.2 Changes shall provide an amount to be added or subtracted from the bid amount, so that the final bid amount can be determined only after the sealed envelope is opened.
- 2.9.3 If the Bidder's written instruction reveals the bid amount in any way prior to the bid opening, the bid shall not be opened or considered for award of a Contract.

2.10 COPIES OF THE DRAWINGS AND SPECIFICATIONS

- 2.10.1 The Contractor shall maintain at the Project site the permits and one (1) complete set of Drawings and Specifications approved by the Tribes, city, local or state building department having lawful jurisdiction over the project.
- 2.10.2 Unless otherwise specified in the Contract Documents, the Engineer, through the Construction Manager, shall furnish to the Contractor, free of charge, four (4) sets of Drawings and Specifications if the Contract price is \$500,000 or less, and seven (7) sets of Drawings and Specifications if the Contract price is in excess of \$500,000.

ARTICLE 3 – BID OPENING AND CONSIDERATION OF BIDS

3.1 DELIVERY OF BIDS

- 3.1.1 It is the responsibility of the Bidder to submit the bid to the Tulalip Tribes of Washington at the designated location prior to the time scheduled for bid opening.
- 3.1.2 If the bid envelope is enclosed in another envelope for the purpose of delivery, the exterior envelope shall be clearly marked as containing a bid with the Project name, the scope of Work or Contract and the date of the bid opening shown on the envelope.
- 3.1.3 No bid shall be considered if it arrives after the time set for the bid opening as determined by the employee or agent of the Tulalip Tribes of Washington designated to open the bids.

3.2 BID OPENING

- 3.2.1 Sealed bids will be received at the office designated in the Notice to Bidders until the time stated when all bids will be opened, read aloud and the tabulation made public.
- 3.2.2 The public opening and reading of bids is for informational purposes only and is not to be construed as an acceptance or rejection of any bid submitted.
- 3.2.3 The contents of the bid envelope shall be a public record and open for inspection, upon request, at any time after the bid opening.

3.3 BID OPENING EXTENSION

- 3.3.1 If any Addendum is issued within 72 hours prior to the published time for the bid opening, excluding Saturdays, Sundays and legal holidays, the bid opening shall automatically be extended one (1) week, with no further advertising required.

3.4 BID EVALUATION CRITERIA

- 3.4.1 The Tulalip Tribes of Washington reserves the right to accept or reject any bid or bids and to award the Contract to any remaining Bidder the Tulalip Tribes of Washington determines to be the lowest responsive and responsible Bidder pursuant to paragraph IB 3.5.1 or the most responsive and responsible Bidder pursuant to paragraph IB 3.5.2 The Tulalip Tribes of Washington reserves the right to accept or reject any or all Alternates, in whole or in part, and the right to reject any Alternate or Alternates and to accept any remaining Alternate or Alternates. Alternates may be accepted or rejected in any order.
- 3.4.2 The Tulalip Tribes of Washington may reject the bid of any Bidder who has engaged in collusive bidding.
- 3.4.3 The Tulalip Tribes of Washington reserves the right to waive, or to allow any Bidder a reasonable opportunity to cure, a minor irregularity or technical deficiency in a bid, provided the irregularity or deficiency does not affect the bid amount or otherwise give the Bidder a competitive advantage. Noncompliance with any requirement of the Contract Documents may cause a Bidder to be rejected.
- 3.4.4 The Tulalip Tribes of Washington may reject all bids for one or more bid packages, prior to, during or after evaluation of Bidders pursuant to paragraph IB 3.5.8, and may advertise for other bids, using the original estimate or an amended estimate, for such time, in such form and in such newspapers as the Tulalip Tribes of Washington may determine.

3.5 BID EVALUATION PROCEDURE

- 3.5.1 The Contract will be awarded to the lowest responsive and responsible Bidder as determined in the discretion of the Tulalip Tribes of Washington, unless Bidders are advised during the bidding process award will be made pursuant to paragraph IB 3.5.2, or all bids will be rejected in accordance with applicable Tribal Ordinances or Codes.
 - 3.5.1.1 In determining which Bidder is lowest responsive and responsible, the Tulalip Tribes of Washington shall consider the Base Bid, the bids for any Alternate or Alternates and the bids for any Unit Price or Unit Prices which the Tulalip Tribes of Washington determines to accept.

- 3.5.1.2 If the Request for Bid Proposal is not restricted to certified NAOB firms preference in the Bid Award will be given to the certified NAOB firm with the lowest responsive bid if that bid is within budgetary limits established for the project or activity for which the bids are being taken and no more than “X” higher than the bid prices of the lowest responsive bid from any certified non-NAOB bidder as set forth in The Tulalip Code, Chapter 9.05 – TERO Code paragraph 9.05.340 (3).
- 3.5.1.3 The total of the bids for accepted Alternate(s) and Unit Price(s) will be added to the Base Bid for the purpose of determining the lowest Bidder.
- 3.5.1.4 If two or more Bidders submit the same bid amount and are determined to be responsive and responsible, the Tulalip Tribes of Washington reserves the right to select one Bidder in the following manner:
 - 3.5.1.4.1 If the Request for Bid Proposal is restricted to NAOB Firms and a majority of the funds used to pay the contract or subcontract are derived from Tulalip tribal resources preference shall be given to the certified Tulalip Tribal Member NAOB Firms; otherwise, selection shall be by lot in the presence of all such Bidders in such a manner as the Construction Manager shall determine and such selection shall be final.
 - 3.5.1.4.2 If the Request for Bid Proposal is restricted to Tulalip Tribal Member Owned NAOB Firms selection shall be by lot in the presence of all such Bidders in such a manner as the Construction Manager shall determine and such selection shall be final.
 - 3.5.1.4.3 If the Request for Bid Proposal is not restricted to NAOB Firms selection shall be by lot in the presence of all such Bidders in such a manner as the Construction Manager shall determine and such selection shall be final.
- 3.5.2 When listing “Preferred Employees” related to Section I – KEY EMPLOYEES OF BIDDER shall only list KEY “Preferred Employees” committed to be employed by Bidder in the performance of Bidder’s self-performed scope of work.
 - 3.5.2.1 Key Employees are employees who are in a top supervisory position or performs a critical function such that an employer would risk likely financial damage or loss if that task were assigned to a person unknown to the employer.
 - 3.5.2.2 To be eligible for the award of points under this section Preferred Key Employees of Bidder shall be employed by the Bidder on the Project for 100% of the time the Bidder has crews on site performing work. Company owners are not eligible for the award of points under this section.
- 3.5.3 When listing “Preferred Employees” related to Section II – PREFERRED EMPLOYEES Bidder shall only list the number of “Preferred Employees” by each trade committed to be employed by Bidder in the performance of Bidder’s self-performed scope of work.

- 3.5.3.1 To be eligible for the award of points under this section Preferred Employees shall be employed by the Bidder on the Project for a minimum of 80% of the time the Bidder has crews on site performing work. Company owners are not eligible for the award of points under this section.
- 3.5.4 Bidder shall not list the name of a "Preferred Employee" in more than one section. Should a "Preferred Employee" be listed in more than one section (i.e., Section I or II) the so named "Preferred Employee" will only be considered under Section I – KEY EMPLOYEES as a basis for award of points.
- 3.5.5 When listing lower tiered subcontractors and or suppliers related to Section IV – LIST OF LOWER TIERED SUBCONTRACTOR(S) AND OR SUPPLIER(S) Bidder shall identify the type of enterprise or organization Bidder intends to contract with in the columns titled "Type of Lower-Tier". If Bidder intends to subcontract a certain portion of the work with a certified NAOB subcontractor, Bidder shall so designate by placing an "X" in the column titled "SUB" (abbreviated for subcontractor). If Bidder intends to purchase a certain portion of the work through a certified NAOB material supplier, Bidder shall so designate by placing an "X" in the column titled "SUP" (abbreviated for supplier). Bidder shall be awarded 100% of the value of the work subcontracted with a certified NAOB and ten-percent (10%) of the value of the work purchased through a certified NAOB material supplier in the determination of awarded points related to Section IV.
 - 3.5.5.1 It is the expressed intent of paragraph IB 3.5.6 to encourage Bidders to contract with certified NAOB Firms in which the Bidder and enterprise or organization have no proprietary relationship ("Unrelated NAOB"). Points will only be awarded for contracting with Unrelated NAOB Firms.
 - 3.5.5.2 In determining the award of points under paragraph IB 3.5.6, Lower tiered NAOB Firms shall have no proprietary relationship with other lower tiered NAOB Firms.
 - 3.5.5.3 In determining the award of points under paragraph IB 3.5.6, equipment (unoperated) and tool rentals shall be considered as a supplier. Trucking (Dump, Low-boy, Long haul, etc.) and Operated Equipment Rental shall be considered as a subcontractor.
 - 3.5.5.4 When Section IV – LIST OF LOWER TIERED SUBCONTRACTOR(S) AND OR SUPPLIER(S) is further defined by paragraph IB 1.1.7, which may include minimum requirements for contracting with Tulalip Tribal Member NAOB firms and NAOB firms, the provisions of paragraph IB 3.5.6 shall be applied to Tulalip Tribal Member NAOB and NAOB categories as defined by The Tulalip Code, Chapter 9.05 – TERO Code.
- 3.5.6 In determining whether a Bidder is responsible, factors to be considered include, without limitation:
 - 3.5.6.1 Whether the Bidder's bid responds to the Contract Documents in all material respects and contains no irregularities or deviations from the Contract Documents which would affect the amount of the bid or otherwise give the Bidder a competitive advantage.

- 3.5.6.2 Preference to Indians in hiring promotions, training and all other aspects of employment contracting and subcontracting;
- 3.5.6.3 Preferences required by Tribal Ordinances, Codes, or Laws;
- 3.5.6.4 The experience of the Bidder;
- 3.5.6.5 The financial condition of the Bidder;
- 3.5.6.6 The conduct and performance of the Bidder on previous contracts;
- 3.5.6.7 The facilities of the Bidder;
- 3.5.6.8 The management skills of the Bidder;
- 3.5.6.9 The ability of the Bidder to execute the Contract properly;
- 3.5.6.10 The evaluation of a bid below the median of other bids pursuant to paragraph IB 5.2.
- 3.5.6.11 Bidder's commitment to Safety and worker training.
- 3.5.7 The Construction Manager may obtain from the lowest or most responsive and responsible Bidder, as applicable, and such other Bidders as the Construction Manager determines to be appropriate any information appropriate to the consideration of factors showing responsibility, including without limitation the following:
 - 3.5.7.1 The two most responsive and responsible bidders will be requested to submit further documentation for both TERO Preferred Employment and the Tulalip Tribal Member NAOB and NAOB Subcontractor and Suppliers utilization commitments listed on the Bidder's Bid Form.
 - 3.5.7.1.1 Supplemental Documentation to be submitted to for each TERO Preferred Employee listed on the Bid Proposal Forms includes, but is not limited to:
 - 3.5.7.1.1.1 Proof of Enrollment issued by a Federally Recognized Indian Tribe or Alaska Native Corporation; or
 - 3.5.7.1.1.2 A signed letter issued by the Tulalip TERO Office certifying that the listed individuals are Preferred Employees.
 - 3.5.7.1.1.3 Bidders shall provide a project staffing plan or a manpowered loaded schedule for the project identifying when the Preferred Employees will be employed on the project and the duration thereof.
 - 3.5.7.1.2 Additional information to be submitted to for each NAOB listed on the Bid Form includes, but is not limited to:
 - 3.5.8.1.2.1 Correct business name, federal employee identification number (if available), and mailing address.
 - 3.5.7.1.2.2 List of all bid items assigned to each successful Tulalip Tribal Member NAOB or NAOB firm,

including unit prices and extensions (if applicable).

3.5.7.1.2.3 Description of partial items (if any) to be sublet to each successful Tulalip Tribal Member NAOB or NAOB firm specifying the distinct elements of work to be performed by the Tulalip Tribal Member NAOB or NAOB firm and including the dollar value of the Tulalip Tribal Member NAOB or NAOB firm's portion.

3.5.7.1.2.4 Submit evidence of certification for the Tulalip Tribal Member NAOB or NAOB.

3.5.7.1.3 Total amounts shown for each Tulalip Tribal Member NAOB or NAOB firm shall not be less than the amount shown on the Bid Form. This submittal, showing the Tulalip Tribal Member NAOB or NAOB firm work item breakdown, when accepted by the Contracting Agency and resulting in contract execution, shall become a part of the contract. A breakdown that does not conform to the Tulalip Tribal Member NAOB or NAOB utilization certified on the Bid Form or that demonstrates a lesser amount of Tulalip Tribal Member NAOB or NAOB participation than that included on the Bid Form will be returned for correction. The contract will not be executed by the Contracting Agency until a satisfactory breakdown has been submitted.

3.5.7.2 Overall experience of the Bidder, including number of years in business under present and former business names;

3.5.7.3 Complete listing of all ongoing and completed public and private construction projects of the Bidder in the last three years, including the nature and value of each contract and a name/address/phone number for each owner;

3.5.7.4 Complete listing of any public or private construction projects for which the Bidder has been declared in default; also, any EPA, OSHA, WISHA or other regulating entity issues or citations in the last ten (10) years;

3.5.7.5 Certified financial statement and bank references;

3.5.7.6 Description of relevant facilities of the Bidder;

3.5.7.7 Description of the management experience of the Bidder's project manager(s) and superintendent(s);

3.5.7.8 Complete list of subcontractors which the Bidder proposes to employ on the Project;

3.5.7.9 Current Washington Workers' Compensation Certificate or other similar type documentation supporting workers' compensation coverage;

3.5.7.10 Worker's Compensation Rating for current and previous 5 years; and

3.5.7.11 If the Bidder is a foreign corporation, i.e., not incorporated under the laws of Washington, a Certificate of Good Standing from the Secretary of State showing the right of the Bidder to do business in the State; or, if the Bidder is a person or partnership, the Bidder has filed with the Secretary of State a Power of Attorney designating the Secretary of State as the Bidder's agent for the purpose of accepting service of summons in any action brought under this Contract.

3.5.8 Each such Bidder's information shall be considered separately and not comparatively. If the lowest or most responsive Bidder, as applicable, is responsible, the Contract shall be awarded to such Bidder or all bids are rejected.

3.5.9 If the lowest or most responsive Bidder, as applicable, is not responsible, and all bids are not rejected, the Tulalip Tribes of Washington shall follow the procedure set forth in paragraph IB 3.5.8 with each next lowest or most responsive Bidder, as applicable, until the Contract is awarded, all bids are rejected or all Bidders are determined to be not responsible unless award of the Contract was based upon a "Weight of Award" points system as defined in paragraph 3.5.2.

3.6 REJECTION OF BID BY THE TULALIP TRIBES OF WASHINGTON

3.6.1 If the lowest or most responsive Bidder, as applicable, is not responsible, the Tulalip Tribes of Washington shall reject such Bidder and notify the Bidder in writing by certified mail of the finding and the reasons for the finding.

3.6.2 A Bidder who is notified in accordance with paragraph IB 3.6.1 may object to such Bidder's rejection by filing a written protest which must be received by the Tulalip Tribes of Washington, through the Construction Manager, within five (5) days of the notification provided pursuant to paragraph IB 3.6.1.

3.6.3 Upon receipt of a timely protest, representatives of the Tulalip Tribes of Washington shall meet with the protesting Bidder to hear the Bidder's objections.

3.6.3.1 No award of the Contract shall become final until after the representatives of the Tulalip Tribes of Washington have met with all Bidders who have timely filed protests and the award of the Contract is affirmed by the Tulalip Tribes of Washington.

3.6.3.2 If all protests are rejected in the Tulalip Tribes of Washington's discretion the award of the Contract shall be affirmed by the Tulalip Tribes of Washington or all bids shall be rejected.

3.7 NOTICE OF INTENT TO AWARD

3.7.1 The Tulalip Tribes of Washington shall notify the apparent successful Bidder that upon satisfactory compliance with all conditions precedent for execution of the Contract Form, within the time specified, the Bidder will be awarded the Contract.

3.7.2 The Tulalip Tribes of Washington reserves the right to rescind any Notice of Intent to Award if the Tulalip Tribes of Washington determines the Notice of Intent to Award was issued in error.

ARTICLE 4 – WITHDRAWAL OF BID

4.1 WITHDRAWAL PRIOR TO BID OPENING

4.1.1 A Bidder may withdraw a bid after the bid has been received by the Tulalip Tribes of Washington, provided the Bidder makes a request in writing and the request is

received by the Tulalip Tribes of Washington prior to the time of the bid opening, as determined by the employee or agent of the Tulalip Tribes of Washington designated to open bids.

4.2 WITHDRAWAL AFTER BID OPENING

- 4.2.1 All bids shall remain valid and open for acceptance for a period of, at least, 60 days after the bid opening; provided, however, that within two (2) business days after the bid opening, a Bidder may withdraw a bid from consideration if the bid amount was substantially lower than the amounts of other bids, provided the bid was submitted in good faith, and the reason for the bid amount being substantially lower was a clerical mistake, as opposed to a judgment mistake, and was actually due to an unintentional and substantial arithmetic error or an unintentional omission of a substantial quantity of Work, labor or material made directly in the compilation of the bid amount.
- 4.2.1.1 Notice of a request to withdraw a bid must be made in writing filed with the Tulalip Tribes of Washington, through the Construction Manager, within two (2) business days after the bid opening.
- 4.2.1.2 No bid may be withdrawn under paragraph IB 4.2.1 when the result would be the awarding of the Contract on another bid to the same Bidder.
- 4.2.2 If a bid is withdrawn under paragraph IB 4.2.1, the Tulalip Tribes of Washington may award the Contract to another Bidder the Tulalip Tribes of Washington determines to be the next lowest or most responsive and responsible Bidder, as applicable, or reject all bids and advertise for other bids. If the Tulalip Tribes of Washington advertises for other bids, the withdrawing Bidder shall pay the costs, in connection with the rebidding, of printing new Contract Documents, required advertising and printing and mailing notices to prospective Bidders, if the Tulalip Tribes of Washington finds that such costs would not have been incurred but for such withdrawal.
- 4.2.3 A Bidder may withdraw the Bidder's bid at any time after the period described in paragraph IB 4.2.1 by written notice to the Tulalip Tribes of Washington.

4.3 REFUSAL BY TULALIP TRIBES OF WASHINGTON TO ACCEPT WITHDRAWAL

- 4.3.1 If the Tulalip Tribes of Washington intends to contest the right of a Bidder to withdraw a bid pursuant to paragraph IB 4.2.1, a hearing shall be held by one or more representatives of the Tulalip Tribes of Washington within ten (10) days after the bid opening and an order shall be issued by the Tulalip Tribes of Washington allowing or denying the claim of such right within five (5) days after such hearing is concluded. The Tulalip Tribes of Washington, through the Construction Manager, shall give the withdrawing Bidder timely notice of the time and place of any such hearing.
- 4.3.1.1 The Tulalip Tribes of Washington shall make a stenographic record of all testimony, other evidence, and rulings on the admissibility of evidence presented at the hearing. The Bidder shall pay the costs of the hearing.

4.4 REFUSAL BY BIDDER TO PERFORM

- 4.4.1 If the Tulalip Tribes of Washington denies the claim for withdrawal and the Bidder elects to appeal or otherwise refuses to perform the Contract, the Tulalip Tribes of

Washington may reject all bids or award the Contract to the next lowest or most responsive and responsible Bidder, as applicable.

4.5 EFFECT OF WITHDRAWAL

- 4.5.1 No Bidder who is permitted, pursuant to paragraph IB 4.2.1, to withdraw a bid, shall for compensation supply any material or labor to, or perform any subcontract or other work agreement for, the person to whom the Contract is awarded or otherwise benefit, directly or indirectly, from the performance of the Project for which the withdrawn bid was submitted, without the written approval of the Tulalip Tribes of Washington.
- 4.5.2 The person to whom the Contract is awarded and the withdrawing Bidder shall be jointly liable to the Tulalip Tribes of Washington in an amount equal to any compensation paid to or for the benefit of the withdrawing Bidder without such approval.

ARTICLE 5 – BID ESTIMATE

5.1 BID TOTALS

- 5.1.1 No Contract shall be entered into if the price of the Contract, or if the Project involves multiple Contracts where the total price of all Contracts for the Project, is in excess of ten (10) percent above the entire estimate.

5.2 SUBSTANTIALLY LOW BID

- 5.2.1 No Bidder shall be responsible if the Bidder's bid is more than twenty (20) percent below the median of all higher bids received for a Contract where the estimate is \$100,000 or more, and no Bidder shall be responsible if the Bidder's bid is more than twenty-five (25) percent below the median of all higher bids received for a Contract where the estimate is less than \$100,000, unless the following procedures are followed.
 - 5.2.1.1 The Construction Manager and the Engineer conduct an interview with the Bidder to determine what, if anything, has been overlooked in the bid, and to analyze the process planned by the Bidder to complete the Work. The Construction Manager and the Engineer shall submit a written summary of the interview to the Tulalip Tribes of Washington.
 - 5.2.1.2 The Tulalip Tribes of Washington reviews and approves the Bidder's responsibility pursuant to paragraph IB 3.5.8.
 - 5.2.1.3 The Construction Manager notifies the Bidder's Surety, if applicable, in writing that the Bidder with whom the Tulalip Tribes of Washington intends to enter a Contract submitted a bid determined to be substantially lower than the median of all higher bids.

ARTICLE 6 – BID GUARANTY AND CONTRACT BOND

6.1 BID GUARANTY

- 6.1.1 The Bidder must file with the bid a Bid Guaranty, payable to the Tulalip Tribes of Washington, in the form of either:

- 6.1.1.1 The signed Bid Guaranty and Contract Bond contained in the Contract Documents for the amount of the Base Bid plus add Alternates; or
- 6.1.1.2 The signed Bid Proposal Bond contained in the Contract Documents for the amount of the Base Bid plus add Alternates; or
- 6.1.1.3 A cashier's check in the amount of five (5) percent of the Base Bid plus add Alternates.
- 6.1.1.4 If Bidder elects to file with the bid a Bid Guaranty under paragraph IB 6.1.1.3 Bidder shall also file with the bid a signed Statement of Intended Surety contained in the Contract Documents.
- 6.1.2 The Bid Guaranty shall be in form and substance satisfactory to the Tulalip Tribes of Washington and shall serve as an assurance that the Bidder will, upon acceptance of the bid, comply with all conditions precedent for execution of the Contract Form, within the time specified in the Contract Documents. Any Bid Guaranty must be payable to the Tulalip Tribes of Washington.
- 6.1.3 If the blank line on the Bid Guaranty and Contract Bond or Bid Proposal Bond is not filled in, the penal sum will automatically be the full amount of the Base Bid plus add Alternates. If the blank line is filled in, the amount must not be less than the full amount of the Base Bid plus add Alternates, stated in dollars and cents. A percentage is not acceptable.
- 6.1.4 The Bid Guaranty and Contract Bond or Bid Proposal Bond must be signed by an authorized agent, with Power of Attorney, from the Surety. The Bid Guaranty and Contract Bond or Bid Proposal Bond must be issued by a Surety licensed to transact business in the State of Washington.
- 6.1.5 Bid Guaranties will be returned to all unsuccessful Bidders 90 days after the bid opening. If used, the cashier's check will be returned to the successful Bidder upon compliance with all conditions precedent for execution of the Contract Form.

6.2 FORFEITURE

- 6.2.1 If for any reason, other than as authorized by paragraph IB 4.2.1 or paragraph IB 6.3, the Bidder fails to execute the Contract Form, and the Tulalip Tribes of Washington awards the Contract to another Bidder which the Tulalip Tribes of Washington determines is the next lowest or most responsive and responsible Bidder, as applicable, the Bidder who failed to enter into a Contract shall be liable to the Tulalip Tribes of Washington for the difference between such Bidder's bid and the bid of the next lowest or most responsive Bidder, as applicable, or for a penal sum not to exceed five (5) percent of the bid amount, whichever is less.
- 6.2.2 If the Tulalip Tribes of Washington then awards a Contract to another Bidder which the Tulalip Tribes of Washington determines is the next lowest or most responsive and responsible Bidder, as applicable, and such Bidder also fails or refuses to execute the Contract Form, the liability of such lowest or most responsive and responsible Bidder, as applicable, shall, except as provided in paragraph IB 6.3, be the amount of the difference between the bid amounts of such lowest or most responsible Bidder, as applicable, and another Bidder which the Tulalip Tribes of Washington determines is the next lowest or most responsive and responsible Bidder, as applicable, but not in excess of the liability specified in paragraph IB 6.2.1. Liability on account of an award to each succeeding lowest or most

responsive and responsible Bidder, as applicable, shall be determined in like manner.

- 6.2.3 If the Tulalip Tribes of Washington does not award the Contract to another Bidder which the Tulalip Tribes of Washington determines is the next lowest or most responsive and responsible Bidder, as applicable, but resubmits the Project for bidding, the Bidder failing to execute the Contract Form shall, except as provided in paragraph IB 6.3, be liable to the Tulalip Tribes of Washington for a penal sum not to exceed five (5) percent of such Bidder's bid amount or the costs in connection with the resubmission, of printing new Contract Documents, required advertising and printing and mailing notices to prospective Bidders, whichever is less.

6.3 EXCEPTION TO FORFEITURE

- 6.3.1 A Bidder for a Contract costing less than \$500,000 may withdraw a bid from consideration if the Bidder's bid for some other Contract costing less than \$500,000 has already been accepted, if the Bidder certifies in good faith that the total price of all such Bidder's current contracts is less than \$500,000, and if the Bidder's Surety, if applicable, certifies in good faith that the Bidder is unable to perform the subsequent contract because to perform such Contract would exceed the Bidder's bonding capacity.
- 6.3.2 If a bid is withdrawn pursuant to paragraph IB 6.3.1, the Tulalip Tribes of Washington may award the Contract to another Bidder which the Tulalip Tribes of Washington determines is the next lowest or most responsive and responsible Bidder, as applicable, or reject all bids and resubmit the Project for bidding, and neither the withdrawing Bidder nor such Bidder's Surety, as applicable, shall be liable for the difference between the Bidder's bid and that of another Bidder which the Tulalip Tribes of Washington determines is the next lowest or most responsive and responsible Bidder, as applicable, for a penal sum, or for the costs of printing new Contract Documents, required advertising and printing and mailing notices to prospective Bidders.

6.4 CONTRACT BOND

- 6.4.1 If the Bidder executes the Contract Form, the Bidder shall, at the same time, provide a Bond meeting the requirements of the Contract Documents, unless the Bidder provided an acceptable Bid Guaranty and Contract Bond at the time of the bid opening. A "A- VII" or better Best Rated Surety Company shall issue the required bond.
- 6.4.2 The Bond shall be in the full amount of the Contract to indemnify the Tulalip Tribes of Washington against all direct and consequential damages suffered by failure of the Contractor to perform according to the provisions of the Contract and in accordance with the plans, details, specifications and bills of material therefore and to pay all lawful claims of Subcontractors, Material Suppliers, and laborers for labor performed or materials furnished in carrying forward, performing or completing the Contract.
- 6.4.3 The Bond shall be supported by a Power of Attorney of the agent signing for a Surety. The Bond shall be supported by a current and signed Certificate of Compliance or Certificate of Authority showing the Surety is licensed to do business in Washington.

6.5 NOT USED

ARTICLE 7 – CONTRACT AWARD AND EXECUTION

7.1 NONCOMPLIANCE WITH CONDITIONS PRECEDENT

7.1.1 The award of the Contract and the execution of the Contract Form are based upon the expectation that the lowest or most responsive and responsible Bidder, as applicable, will comply with all conditions precedent for execution of the Contract Form within ten (10) days of the date of the Notice of Intent to Award.

7.1.1.1 Noncompliance with the conditions precedent for execution of the Contract Form within ten (10) days of the date of the Notice of Intent to Award shall be cause for the Tulalip Tribes of Washington to cancel the Notice of Intent to Award for the Bidder's lack of responsibility and award the Contract to another Bidder which the Tulalip Tribes of Washington determines is the next lowest or most responsive and responsible Bidder, as applicable, or resubmit the Contract for bidding, at the discretion of the Tulalip Tribes of Washington.

7.1.1.2 The Tulalip Tribes of Washington may extend the time for submitting the conditions precedent for execution of the Contract Form for good cause shown. No extension shall operate as a waiver of the conditions precedent for execution of the Contract Form.

7.2 TIME LIMITS

7.2.1 The failure to award the Contract and to execute the Contract Form within 60 days of the bid opening invalidates the entire bid process and all bids submitted, unless the time is extended by written consent of the Bidder whose bid is accepted by the Tulalip Tribes of Washington and with respect to whom the Tulalip Tribes of Washington awards and executes a Contract.

7.2.1.1 If the Contract is awarded and the Contract Form is executed within 60 days of the bid opening, any increases in material, labor and subcontract costs shall be borne by the Bidder without alteration of the amount of the bid.

7.2.1.2 If the cause of the failure to execute the Contract within 60 days of the bid opening is due to matters for which the Tulalip Tribes of Washington is solely responsible, the Contractor shall be entitled to a Change Order authorizing payment of verifiable increased costs in materials, labor or subcontracts.

7.2.1.3 If the cause of the failure to execute the Contract within 60 days of the bid opening is due to matters for which the Contractor is responsible, no request for increased costs will be granted.

7.3 CONDITIONS PRECEDENT FOR EXECUTION OF CONTRACT FORM

7.3.1 Bond, if required. To support the Bond, a current and signed Certificate of Compliance or Certificate of Authority showing the Surety is licensed to do business in Washington;

- 7.3.2 Current Washington Workers' Compensation Certificate or other similar type documentation supporting workers' compensation coverage;
- 7.3.3 Certificate of Insurance (ISO general liability form CG 2010 11/85 edition or equivalent form is acceptable) and copy of additional insured endorsement. The certificate shall clearly state The Tulalip Tribes of Washington, Consolidated Borough of Quil Ceda Village, and the State of Washington are named as "Additional Insureds" to the General Liability, Automobile Liability, and Excess Liability Policies. Workers Compensation coverage includes a waiver of subrogation against the Tulalip Tribes of Washington and Consolidated Borough of Quil Ceda Village." The wording "endeavor to" and "but failure to" under CANCELLATION shall be stricken from the certificate. The Tulalip Tribes of Washington reserves the right to request a certified copy of the Contractor's insurance policies meeting the requirements of GC Article 12;
- 7.3.4 If the Bidder is a foreign corporation, i.e., not incorporated under the laws of Washington, a Certificate of Good Standing from the Secretary of State showing the right of the Bidder to do business in the State; or, if the Bidder is a person or partnership, the Bidder has filed with the Secretary of State a Power of Attorney designating the Secretary of State as the Bidder's agent for the purpose of accepting service of summons in any action brought under this Contract;
- 7.3.5 Contractor signed Contract Form;
- 7.3.6 Completed and approved TERO Contracting and Subcontracting Compliance plan;
- 7.3.7 Current Tulalip Tribes Business License; and
- 7.3.8 Completed and signed Confidentiality Agreement.

7.4 NOTICE TO PROCEED AND SUBMITTALS

- 7.4.1 The Tulalip Tribes of Washington shall issue to the Contractor a Notice to Proceed, which shall establish the date for Contract Completion. The Contractor shall, within ten (10) days of the date of the Notice to Proceed, furnish the Construction Manager with the following submittals:
 - 7.4.1.1 Contract Cost Breakdown;
 - 7.4.1.2 Preliminary schedule of Shop Drawings and Submittals;
 - 7.4.1.3 Outline of qualifications of the proposed superintendent; and
 - 7.4.1.4 Acknowledgement by a TERO Representative the Project related TERO fee has been paid or an agreement has been reached to pay the fee in installments over the course of the Contract.

ARTICLE 8 – APPLICABLE LAW AND FORUM

8.1 FORUM FOR EQUITABLE RELIEF

- 8.1.1 The Tribal Court of the Tulalip Tribes of Washington shall have exclusive jurisdiction over any action or proceeding for any injunction or declaratory judgment concerning any agreement or performance under the Contract Documents or in connection with the Project. Any such action or proceeding arising out of or related in any way to the Contract or performance thereunder shall be brought only in the Tribal Court of the Tulalip Tribes of Washington and the

Contractor irrevocably consents to such jurisdiction and venue. The Contract shall be governed by the law of the State of Washington.

8.2 FORUM FOR MONEY DAMAGES

8.2.1 The Tribal Court of the Tulalip Tribes of Washington shall be the exclusive jurisdiction for any action or proceeding for any injunction or declaratory judgment concerning any agreement or performance under the Contract Documents or in connection with the Project. The Tribal Court of the Tulalip Tribes of Washington shall be the exclusive jurisdiction for any action or proceeding by the Contractor or the Contractor's Surety, if applicable, for any money damages concerning any agreement or performance under the Contract Documents or in connection with the Project.

8.3 FEDERAL ACQUISITION REGULATIONS

8.3.1 Applicable sections of the Federal Acquisition Regulations (FAR) are a part of this Contract by reference. Access the entire FAR regulations at the following website:

<http://acquisition.gov/far/>

The FAR sections are applicable to the work covered in the Proposal and include:

- 52.203-15 Whistleblower Protections Under the American Recovery and Reinvestment Act of 2009.
- 52.204-6 Data Universal Numbering System (DUNS) Number.
- 52.204-7 Central Contractor Registration.
- 52.204.10 Reporting Subcontractor Awards
- 52.225-21 Required use of American Iron, Steel and Other Manufactured Goods – Buy American Act – Construction Materials

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The Tulalip Tribes of Washington

BID PROPOSAL FORM

Project Name: MBR Treatment Facility Upgrade

Date of Bid: _____

Location of Project: 9010 91st St. NE
Tulalip, WA 98271

COMPANY NAME OF BIDDER: _____

CERTIFIED NATIVE AMERICAN OWNED BUSINESS:

YES _____ If Yes, Percentage (%) of Indian Ownership: _____ **NO** _____

Having read and examined the Contract Documents, including without limitation the Drawings and Specifications, prepared by the Engineer and the Tulalip Tribes of Washington for the above-referenced Project, and the following Addenda:

ADDENDA ACKNOWLEDGED (Enter Addenda Number and Date of Addenda below):

- | | |
|----------|----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |

The undersigned Bidder proposes to perform all Work for the applicable Contract, in accordance with the Contract Documents, for the following sums:

BASE BID FOR PACKAGE NO. 17-004

MBR Treatment Facility Upgrade

Refer to Division 0, TERO Code, and Special Provisions, Section 1-07.2 State Taxes, for application of TERO and Taxes on all schedules

BID SCHEDULES

This project has been separated into two bid schedules. The delineation of what is included in these schedules is made on the Contract Drawings. Schedule A generally includes construction at the Headworks Building and between MBR Building and other buildings. Schedule B generally includes construction in the MBR Building and MBR tanks. The lowest responsive and responsible bid price shall be determined by the Tribes. This determination will be made based on what Schedule or combination of Schedules is best for the Tribes. Award schedule for Schedule A shall be based on these Contract Documents. The schedule for award for Schedule B (if awarded) is anticipated to be September 14, 2018. If this award is delayed by 12 months or less, the Schedule B bid price shall be inflated based on the percent ENR Seattle Construction Cost index change from September 2018 to the month of Schedule B award. If the award is delayed more than 12 months, the Contractor and Tribes shall negotiate a new price, but the Tribes also reserve the right to cancel the Schedule B part of the contract at any time.

TULALIP TRIBES MBR TREATMENT FACILITY UPGRADE PROPOSAL SCHEDULE OF PRICES

(Washington State Sales Tax Does Apply)

BID SCHEDULE A - BASE

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX. QTY.	UNIT PRICE DOLLAR CENTS	AMOUNT DOLLAR CENTS
1	MOBILIZATION AND DEMOBILIZATION	LS	1	\$	\$
2	MINOR CHANGE	EST	1	\$40,000	\$40,000
3	SCHEDULE A OF MBR TREATMENT FACILITY UPGRADE (Except for items 1, 2, 4, 5, and 6)	LS	1	\$	\$
4	MCC 3A & 3B, Blower VFDs, PLC panels LCP 1000, LCP-2000, LCP-2014 and LCP-3600	LS	1	\$	\$
5	HEADWORKS DRUM SCREEN SUPPLY AND INSTALLATION	LS	1	\$	\$
6	KUBOTA MBR "SUBMITTAL DURING CONSTRUCTION"	EST	1	\$50,000	\$50,000
Subtotal Base Schedule A:					\$
TERO Fee 1.75%					\$
TOTAL SCHEDULE A, Base (Including TERO):					\$

TULALIP TRIBES
TULALIP MBR TREATMENT FACILITY UPGRADES
PROPOSAL
ADDITIVE BID ITEMS SCHEDULE OF PRICES

Washington State Sales Tax Does Apply)

BID SCHEDULE A - ADDITIVE BID ITEM

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX. QTY.	UNIT PRICE DOLLAR CENTS	AMOUNT DOLLAR CENTS
1	PERMEATE PIPING BETWEEN MBR BUILDING AND EFFLUENT BUILDING	LS	1	\$	\$
Subtotal Schedule A (Additive):					\$
TERO Fee 1.75%					\$
TOTAL SCHEDULE A (Additive):					\$
TOTAL SCHEDULE A (Base plus Additive):					\$

TULALIP TRIBES
TULALIP MBR TREATMENT FACILITY UPGRADES
PROPOSAL
SCHEDULE OF PRICES

(Washington State Sales Tax Does Apply)

BID SCHEDULE B

ITEM NO.	ITEM DESCRIPTION	UNIT	APPROX. QTY.	UNIT PRICE DOLLAR CENTS	AMOUNT DOLLAR CENTS
1	MOBILIZATION AND DEMOBILIZATION	LS	1	\$	\$
2	MINOR CHANGE	EST	1	\$40,000	\$40,000
3	SUPPLY AND INSTALLATION OF AIR BLOWERS 1 AND 3 (no electrical)				
4	SUPPLY AND INSTALLATION OF MLR PUMPS 1, 1/3 AND 3 (no electrical)				
5	SCHEDULE B OF MBR TREATMENT FACILITY UPGRADE (except for items 1, 2, 3, 4, 6, and 7)	LS	1	\$	\$
6	KUBOTA MBR EQUIPMENT SUPPLY	LS	1	\$931,700	\$931,700
7	SUPPLY AND INSTALLATION OF PERMEATE PUMPS AT MBRs 1, 2, 3 & 4 (no electrical)	LS	1	\$	\$
Subtotal (Base Schedule of Prices):					\$
TERO Fee 1.75%					\$
TOTAL SCHEDULE B (Including TERO):					\$

TULALIP TRIBES
MBR TREATMENT FACILITY UPGRADE
PROPOSAL
SUMMARY OF SCHEDULE OF PRICES
(Washington State Sales Tax Does Apply)

SCHEDULE A TOTAL (Base & Additive) \$ _____

SCHEDULE B TOTAL \$ _____

BID TOTAL \$ _____

TRENCH EXCAVATION SAFETY PROVISIONS: If contracted work contains any work that requires trenching exceeding a depth of four (4) feet, all costs for trench safety shall be included in the Base Bid amount for adequate trench safety systems in compliance with Chapter 39.04 RCW and WAC 296-155-650. The purpose of this provision is to ensure that the bidder agrees to comply with all the relevant trench safety requirements of Chapter 49.17 RCW. This bid amount shall be considered as part of the total Base Bid amount set forth above.

The following items shall also be considered in the review and award of this Contact. Bidder shall complete each section as applicable. By submission of this bid proposal, Bidder acknowledges their commitment to employ and or contract work to the parties identified below during the performance of Bidder's awarded Work.

SECTION I – KEY EMPLOYEES OF BIDDER (if required, attach additional sheets if needed) – (Weight of Award 5 points)

		PREFERRED EMPLOYEE	
NAME	POSITION	Yes	No
1.	1.		
2.	2.		
3.	3.		
4.	4.		
5.	5.		

SECTION II – PREFERRED “TRADE” EMPLOYEES (if required, attach additional sheets if needed) – (Weight of Award 10 points)

NUMBER OF PREFERRED “TRADE” EMPLOYEES	NUMBER OF PREFERRED “TRADE” EMPLOYEES
1.	2.
3.	4.
5.	6.
7.	8.
9.	10.

SECTION III – PEAK WORK FORCE OF ALL EMPLOYEES ANTICIPATED TO BE EMPLOYED BY BIDDER AT THE PROJECT SITE IN THE PERFORMANCE OF THE WORK:

(Insert Number of Employees)

SECTION IV – LIST OF LOWER TIERED SUBCONTRACTOR(S) AND OR SUPPLIER(S)

(Total of Sections IV.A and IV.B) – (Weight of Award 25 points)

SECTION IV A – LIST OF TULALIP TRIBAL MEMBER NAOB SUBCONTRACTOR(S) AND OR SUPPLIER(S)The tribal/NAOB subcontractor listed shall work on Schedule A and B or they cannot be listed. (if required, attach additional sheets if needed) – (Weight of Award 15 points)

NAME OF SUBCONTRACTOR (SUB) OR SUPPLIER (SUP)	TYPE OF WORK TO BE AWARDED	DOLLAR VALUE OF WORK	TYPE OF LOWER- TIER		TULALIP NAOB	
			SUB	SUP	Yes	No
1.	1.	\$				
2.	2.	\$				
3.	3.	\$				
4.	4.	\$				
5.	5.	\$				
6.	6.	\$				
7.	7.	\$				
8.	8.	\$				
9.	9.	\$				
10.	10.	\$				

SECTION IV B – LIST OF NAOB SUBCONTRACTOR(S) AND OR SUPPLIER(S)The tribal/NAOB subcontractor listed shall work on Schedule A and B or they cannot be listed. (if required, attach additional sheets if needed) – (Weight of Award 10 points)

NAME OF SUBCONTRACTOR (SUB) OR SUPPLIER (SUP)	TYPE OF WORK TO BE AWARDED	DOLLAR VALUE OF WORK	TYPE OF LOWER- TIER		NAOB	
			SUB	SUP	Yes	No
1.	1.	\$				
2.	2.	\$				
3.	3.	\$				
4.	4.	\$				
5.	5.	\$				
6.	6.	\$				
7.	7.	\$				
8.	8.	\$				
9.	9.	\$				
10.	10.	\$				

Should Contractor fail to comply, to the fullest extent possible, with provisions for employment and or contracting as defined in The Tulalip Code, Chapter 9.05 – TERO Code, Contractor may be found to be in breach of Contract. If it is determined that a breach has occurred, Contractor acknowledges that said breach will be grounds to terminate Contractor's Contract agreement without claim against The Tulalip Tribes of Washington or the Project for any additional compensation and or consideration.

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BIDDER'S CERTIFICATION

The Bidder hereby acknowledges that the following representations in this bid are material and not mere recitals:

1. The Bidder has read and understands the Contract Documents and agrees to comply with all requirements of the Contract Documents, regardless of whether the Bidder has actual knowledge of the requirements and regardless of any statement or omission made by the Bidder which might indicate a contrary intention.
2. The Bidder represents that the bid is based upon the Standards specified by the Contract Documents.
3. The Bidder acknowledges that all Work shall be completed within the time established in the Contract Documents, and that each applicable portion of the Work shall be completed upon the respective milestone completion dates, unless an extension of time is granted in accordance with the Contract Documents. The Bidder understands that the award of separate contracts for the Project will require sequential, coordinated and interrelated operations which may involve interference, disruption, hindrance or delay in the progress of the Bidder's Work. The Bidder agrees that the Contract price, as amended from time to time by Change Order, shall cover all amounts due from the Tulalip Tribes of Washington resulting from interference, disruption, hindrance or delay caused by or between Contractors or their agents and employees.
4. The Bidder has visited the Project site, become familiar with local conditions and has correlated personal observations with the requirements of the Contract Documents. The Bidder has no outstanding questions regarding the interpretation or clarification of the Contract Documents.
5. The Bidder agrees to comply with The Tulalip Code, Chapter 9.05 – TERO Code and give preference to Indians in hiring promotions, training and all other aspects of employment contracting and subcontracting.
6. The Bidder agrees to comply with The Tulalip Code, Chapter 9.05 – TERO Code and give preference to certified Indian-owned enterprises and organizations in the award of contracts and subcontracts.
7. The Bidder and each person signing on behalf of the Bidder certifies, and in the case of a joint or combined bid, each party thereto certifies as to such party's entity, under penalty of perjury, that to the best of the undersigned's knowledge and belief: (a) the Base Bid, any Unit Prices and any Alternate Bid in the bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition as to any matter relating to such Base Bid, Unit Prices or Alternate bid with any other Bidder; (b) unless otherwise required by law, the Base Bid, any Unit Prices and any Alternate bid in the bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to the bid opening, directly or indirectly, to any other Bidder who would have any interest in the Base Bid, Unit Prices or Alternate bid; (c) no attempt has been made or will be made by the Bidder to induce any other individual, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

8. The Bidder will execute the Contract Form with the Tulalip Tribes of Washington, if a Contract is awarded on the basis of this bid, and if the Bidder does not execute the Contract Form for any reason, other than as authorized by law, the Bidder and the Bidder's Surety are liable to the Tulalip Tribes of Washington as provided in Article 6 of the Instructions to Bidders.
9. Bidder agrees to furnish any information requested by the Tulalip Tribes of Washington to evaluate the responsibility of the Bidder.

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The Tulalip Tribes of Washington

NON - COLLUSION DECLARATION

Failure to return this Declaration as part of the bid proposal package will make the bid nonresponsive and ineligible for award.

NON-COLLUSION DECLARATION

I, by signing the proposal, hereby declare, under penalty of perjury under the laws of the United States that the following statements are true and correct:

1. That the undersigned person(s), firm, association or corporation has (have) not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the project for which this proposal is submitted.
2. **That by signing the signature page of this proposal, I am deemed to have signed and to have agreed to the provisions of this declaration.**

NOTICE TO ALL BIDDERS

To report rigging activities call:

1-800-424-9071

The U.S. Department of Transportation (USDOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of USDOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the USDOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

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Any modification made to either the bid form or exception taken to the defined scope of work outlined in this bid package may result in the bid proposal being considered non-responsive.

Each bid shall contain the name of every person interested therein. If the Bidder is a corporation, partnership, sole proprietorship, or limited liability corporation, an officer, partner or principal of the Bidder, as applicable, shall print or type the legal name of the Bidder on the line provided and sign the Bid Form. If the Bidder is a joint venture, an officer, partner or principal, as applicable, of each member of the joint venture shall print or type the legal name of the applicable member on the line provided and signs the Bid Form. An unsigned Bid Form will render the Bid as non-responsive.

BIDDER'S NAME (PRINT): _____

Authorized Signature: _____

Title: _____

Company Name: _____

Mailing Address: _____

Telephone Number: (____) _____ Facsimile Number (____) _____

Where Incorporated: _____

Type of Business (circle one): corporation partnership sole proprietorship limited liability corporation

The Tulalip Tribes Business License Number: _____

State of Washington Contractor's License Number: _____

Federal ID Number: _____

Contact Person for Contract processing: _____

BIDDER'S NAME (PRINT): _____

Authorized Signature: _____

Title: _____

Company Name: _____

Mailing Address: _____

Telephone Number: (____) _____ Facsimile Number (____) _____

Where Incorporated: _____

Type of Business (circle one): corporation partnership sole proprietorship limited liability corporation

The Tulalip Tribes Business License Number: _____

State of Washington Contractor's License Number: _____

Federal ID Number: _____

Contact Person for Contract processing: _____

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SUB-CONTRACTORS OR SUPPLIERS

Native American TERO Certified Businesses that are qualified and come within 10% of the low bid, will be provided negotiated preference.

IN DATE ORDER, ALL SUB-CONTRACTORS WILL NEED A COMPLIANCE PLAN

Company	Contact Person	Phone	Native	Sub or Supplier

JOB ORDER

If the TERO jobs skills bank has qualified persons, they are required to receive preference in hiring to comply with the TERO law.

Job Title	Number of Positions	Rate of Pay	Date from / to

Foreman to contact / cell:

I declare that all the answers and statements are true, correct and complete to the best of my knowledge. I understand that untruthful or misleading answers are cause for denial of my application and/or revocation of any certification granted.

Print Name	Signature	Title	Date
------------	-----------	-------	------

~~~~~ Office use only ~~~~~

|                |      |                    |      |          |
|----------------|------|--------------------|------|----------|
|                |      |                    | Yes  | NO       |
| Recommended by | Date | Managers Signature | Date | Approved |
| Notes:         |      |                    |      |          |
|                |      |                    |      |          |
|                |      |                    |      |          |
|                |      |                    |      |          |
|                |      |                    |      |          |
|                |      |                    |      |          |

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## Subcontractor List

Prepared in compliance with RCW 39.30.060 as amended

### To Be Submitted with the Bid Proposal

Project Name \_\_\_\_\_

**Failure to list subcontractors with whom the bidder, if awarded the contract, will directly subcontract for performance of 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 or naming more than one subcontractor to perform the same work will result in your bid being non-responsive and therefore void.**

Subcontractor(s) with whom the bidder will directly subcontract 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 **must** be listed below. The work to be performed is to be listed below the subcontractor(s) name.

**To the extent the Project includes one or more categories of work referenced in RCW 39.30.060, and no subcontractor is listed below to perform such work, the bidder certifies that the work will either (i) be performed by the bidder itself, or (ii) be performed by a lower tier subcontractor who will not contract directly with the bidder.**

|                      |                                  |
|----------------------|----------------------------------|
| Subcontractor Name   | _____                            |
| Work to be performed | _____<br>_____<br>_____<br>_____ |
| Subcontractor Name   | _____                            |
| Work to be performed | _____<br>_____<br>_____<br>_____ |
| Subcontractor Name   | _____                            |
| Work to be performed | _____<br>_____<br>_____<br>_____ |
| Subcontractor Name   | _____                            |
| Work to be performed | _____<br>_____<br>_____<br>_____ |
| Subcontractor Name   | _____                            |
| Work to be performed | _____<br>_____<br>_____<br>_____ |

\* Bidder's are notified that is the opinion of the enforcement agency that PVC or metal conduit, junction boxes, etc, are considered electrical equipment and therefore considered part of electrical work, even if the installation is for future use and no wiring or electrical current is connected during the project.

SR

DOT Form 271-015 EF  
Revised 08/2012

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The Tulalip Tribes of Washington

**NAOB Written Confirmation**

**Native American Owned Business (NAOB)  
Written Confirmation Document**

As an authorized representative of the Native American Owned Business (NAOB), I confirm that we have been contacted by the referenced bidder with regard to the referenced project and if the bidder is awarded the contract we will enter into an agreement with the bidder to participate in the project consistent with the information provided on the bidder's Bid Proposal Form, Section IV.

**Contract Title:** \_\_\_\_\_

**Bidder's Business Name:** \_\_\_\_\_

**NAOB's Business Name:** \_\_\_\_\_

**NAOB Signature:** \_\_\_\_\_

**NAOB's Representative** \_\_\_\_\_

**Name and Title:** \_\_\_\_\_

**Date:** \_\_\_\_\_

The entries must be consistent with what is shown on the bidder's Bid Proposal Form, Section IV. Failure to do so will result in bid rejection. See Instructions to Bidders Section 1.1.7; *Minimum TERO Participation for Subcontractors*.

**Description of Work:** \_\_\_\_\_

**Amount to be Awarded to NAOB:** \_\_\_\_\_

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## The Tulalip Tribes of Washington

### FORM OF BID GUARANTY & CONTRACT BOND

**KNOW ALL PERSONS BY THESE PRESENTS**, that we, the undersigned \_\_\_\_\_ as Principal at \_\_\_\_\_,  
(Address) \_\_\_\_\_  
and \_\_\_\_\_ as Surety, are hereby held and firmly  
bound unto the Tulalip Tribes of Washington, herein referred to as Tulalip Tribes, in the penal  
sum of the dollar amount of the bid submitted by the Principal to the Tulalip Tribes on (date)  
\_\_\_\_\_, \_\_\_\_ to undertake the Project known as: \_\_\_\_\_.

The penal sum, referred to herein, shall be the dollar amount of the Principal's bid to the Tulalip Tribes, incorporating any additive or deductive alternate bids or any additive or deductive allowance bids made by the Principal on the date referred to above to the Tulalip Tribes, which are accepted by the Tulalip Tribes. In no case shall the penal sum exceed the amount of dollars (\$\_\_\_\_\_). (If the above line is left blank, the penal sum will be the full amount of the Principal's bid, including alternates and unit prices. Alternatively, if completed, the amount stated must not be less than the full amount of the bid, including alternates and allowances, in dollars and cents. A percentage is not acceptable.) For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above-named Principal has submitted a bid on the above-referred to project;

NOW, THEREFORE, if the Tulalip Tribes accept the bid of the Principal, and the Principal fails to enter into a proper contract in accordance with the bid, plans, details, specifications and bills of material; and in the event the Principal pays to the Tulalip Tribes the difference not to exceed five percent of the penalty hereof between the amount specified in the bid and such larger amount for which the Tulalip Tribes may in good faith contract with the next lowest bidder to perform the work covered by the bid; or resubmits the project for bidding, the Principal will pay the Tulalip Tribes the difference not to exceed five percent of the penalty hereof between the amount specified in the bid, or the costs, in connection with the resubmission, of printing new contract documents, required advertising and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect. If the Tulalip Tribes accept the bid of the Principal, and the Principal, within ten days after the awarding of the contract, enters into a proper contract in accordance with the bid, plans, details, specifications and bills of material, which said contract is made a part of this bond the same as though set forth herein; and

IF THE SAID Principal shall well and faithfully perform each and every condition of such contract; and indemnify the Tulalip Tribes against all damage suffered by failure to perform such contract according to the provisions thereof and in accordance with the plans, details, specifications and bills of material therefore; and shall pay all lawful claims of subcontractors, material suppliers and laborers for labor performed and materials furnished in the carrying forward, performing or completing of said contract; we, agreeing and assenting to, at this undertaking shall be for the benefit of any material supplier or laborer having a just claim, as well as for the Tulalip Tribes herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the

Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions or additions, in or to the terms of said contract or in or to the plans and specifications, therefore, shall in any wise affect the obligations of said Surety on its bond, and it does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

SIGNED this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_

**PRINCIPAL:**

\_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

**SURETY:**

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_

By: \_\_\_\_\_

Attorney-in-Fact

**SURETY AGENT:**

\_\_\_\_\_

Address: \_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_



## The Tulalip Tribes of Washington

### STATEMENT OF INTENDED SURETY

(Required if Bid Deposit is NOT a Surety Bond)

FURNISH WITH BIDDER'S SEALED BID a written statement prepared and signed by Bidder's intended sureties or surety company, to the effect that: \_\_\_\_\_ (Name of Surety), who meets the requirements of Chapter 48.28 RCW, will promptly provide a surety bond in the amount of 100% of the base bid in the event \_\_\_\_\_ (Bidder's Name) is awarded a Contract for \_\_\_\_\_ (Project Description) and that the proposed Construction Contract is acceptable to the Surety.

Surety:

Signature of Authorized Representative

Printed Name / Title of Authorized Representative

*This statement, if required, must be included in Bidder's sealed bid for Bidder's Bid to be considered.*

By: \_\_\_\_\_

Title: \_\_\_\_\_

**SURETY:**

Address: \_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_

By: \_\_\_\_\_

Attorney-in-Fact

**SURETY AGENT:**

Address: \_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_

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## The Tulalip Tribes of Washington

### BID PROPOSAL BOND

KNOW ALL BY THESE PRESENTS, that (Name of Bidder) \_\_\_\_\_ a corporation, partnership, or individual) duly organized under the laws of the State of \_\_\_\_\_ as principal, and (Name of Surety) \_\_\_\_\_ a corporation duly organized under the laws of the State of \_\_\_\_\_ and authorized to do business in the State of Washington, as surety, are held and firmly bound unto The Tulalip Tribes of Washington in the full and penal sum of five (5) percent of the total amount of the bid proposal of said principal for the work hereinafter described for the payment of which, well and truly to be made, we bind our heirs, executors, administrators and assigns, and successors and assigns, firmly by these presents.

Said bid and proposal, by reference hereto, being made a part hereof.

NOW, THEREFORE, if the said proposal bid by said principal be accepted, and the contract be awarded to said principal, and if said principal shall duly make and enter into and execute said contract and shall furnish a performance, payment and warranty bond as required by The Tulalip Tribes of Washington within a period of ten (10) days from and after said award, exclusive of the day of such award, then this obligation shall be null and void, otherwise it shall remain and be in full force and effect.

IN TESTIMONY WHEREOF, the principal and surety have caused these presents to be signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Principal \_\_\_\_\_

(Name) \_\_\_\_\_

(Address) \_\_\_\_\_

By \_\_\_\_\_

(Signature of Authorized Rep)

(Typed Name of Authorized Rep)

Title \_\_\_\_\_

#### SURETY

Name \_\_\_\_\_

By \_\_\_\_\_  
(Attorney-in-fact for Surety)

\_\_\_\_\_  
(Name & Address of local Office or Agent)

\*This bond must be accompanied by a fully executed Power of Attorney appointing the attorney-in-fact.

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## The Tulalip Tribes of Washington

### PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that we (Name of Contractor) \_\_\_\_\_,  
(Address of Contractor) \_\_\_\_\_ a \_\_\_\_\_, hereinafter  
called (Corporation, Partnership, or Individual) Principal, and (Name of Surety)  
\_\_\_\_\_, (Address of Surety) \_\_\_\_\_ hereinafter called  
Surety, are held and firmly bound unto (Name of Owner) \_\_\_\_\_, (Address of  
Owner) \_\_\_\_\_ hereinafter called Owner, in the penal sum of \_\_\_\_\_  
Dollars, (\$ \_\_\_\_\_), in lawful money of the United States, for the payment of which sum well and truly  
to be made, we bind ourselves, our heirs, executors, administrators and successors jointly and severally,  
firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain  
contract with the owner, dated \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of  
which is hereto \_\_\_\_\_.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors,  
and corporation furnishing materials for or performing labor in the prosecution of the work provided for in  
such contract, and any authorized extension or modification thereof, including all amounts due for  
materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed  
or used in connection with the construction of such work and all insurance premiums on said work, and  
for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be  
void; otherwise to remain in full force and effect.

By: \_\_\_\_\_

\_\_\_\_\_  
Witness of Surety

\_\_\_\_\_  
Attorney-In-Fact

\_\_\_\_\_  
Attorney

\_\_\_\_\_  
Attorney

Note: Date of Bond must not be prior to the date of contract, \_\_\_\_\_. If Contractor is Partnership, all  
partners should execute bond.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most  
current list (Circular 57 – as amended) and be authorized to transact business in the state where the  
project is located.

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## The Tulalip Tribes of Washington

### PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that we (Name of Contractor) \_\_\_\_\_,  
(Address of Contractor) \_\_\_\_\_ a \_\_\_\_\_, hereinafter  
called (Corporation, Partnership, or Individual) Principal, and (Name of Surety)  
\_\_\_\_\_, (Address of Surety) \_\_\_\_\_ hereinafter called  
Surety, are held and firmly bound unto (Name of Owner) \_\_\_\_\_, (Address of  
Owner) \_\_\_\_\_ hereinafter called Owner, in the penal sum of \_\_\_\_\_  
Dollars, (\$ \_\_\_\_\_), in lawful money of the United States, for the payment of which sum well and truly  
to be made, we bind ourselves, our heirs, executors, administrators and successors jointly and severally,  
firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain  
contract with the owner, dated \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of  
which is hereto \_\_\_\_\_.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors,  
and corporation furnishing materials for or performing labor in the prosecution of the work provided for in  
such contract, and any authorized extension or modification thereof, including all amounts due for  
materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed  
or used in connection with the construction of such work and all insurance premiums on said work, and  
for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be  
void; otherwise to remain in full force and effect.

|                   |                  |
|-------------------|------------------|
| _____             | By: _____        |
| Witness of Surety | Attorney-In-Fact |
| _____             | _____            |
| Attorney          | Attorney         |

Note: Date of Bond must not be prior to the date of contract, \_\_\_\_\_. If Contractor is Partnership, all  
partners should execute bond.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most  
current list (Circular 57 – as amended) and be authorized to transact business in the state where the  
project is located.

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# The Tulalip Tribes of Washington

## TRIBAL EMPLOYMENT RIGHTS OFFICE (TERO)

### TULALIP TERO MISSION STATEMENT

The Tulalip TERO has a mission to help improve the quality of life for Tulalip Tribal members and other Native American families through opportunities that can assist them in pursuing quality jobs or careers with decent wages and by protecting their rights of preferential employment, training, business and economic opportunities on and near the Tulalip Reservation. Also, to assist business in achieving compliance with hiring Native American qualified workers.

#### Information

6404 Marine Drive, Tulalip, WA 98271

Office: (360) 716-4747

Fax: (360) 716-0612

Alternate Fax: (360) 716-0249

Driving Direction From Seattle:

Go North on highway I-5. At exit 199, turn RIGHT onto Ramp and turn LEFT (West) onto SR-528 [4th St]. Road name changes to Marine Dr. NE. Turn RIGHT (North-East) onto 64th Street NW.

Driving Direction From Mount Vernon:

Go South on highway I-5. At exit 199, turn RIGHT onto Ramp and bear RIGHT (West) onto Marine Dr. NE. Turn RIGHT (North-East) onto 64th Street NW.

On June 20, 2012, the Tulalip Tribes board of Directors enacted the Tribal Employment Rights Office Code which is the preferential employment and contracting laws of the land within the boundaries of the Tulalip Reservation.

Tulalip TERO office requires businesses to:

- Hire TERO qualified and certified workers;
- Give Native owned businesses the opportunity to bid;
- Fill out and negotiate a compliance plan prior to commencing work; and
- Pay 1.75% TERO fee on all construction projects over \$10,000

### FREQUENTLY ASKED QUESTIONS

The following presents a list of the most frequently asked questions and inquiries about Native American Preference and Tribal Employment Rights Office (TERO).

#### 1. WHAT IS THE PURPOSE OF TERO?

To access more employment & training opportunities for Native Americans and their families. To provide more business & economic opportunities for businesses owned by Native Americans.

#### 2. WHY IS THERE A NEED FOR TERO?

Since unemployment rate in Native communities remains high, Tribes must take strong actions to protect the employment rights of Native American people.

3. *WHAT ARE THE BASIC REQUIREMENTS OF TERO?*

All employers operating within tribal jurisdiction are required to provide Indian preference in employment, training, contracting, and subcontracting. Following are the major provisions and requirements found in most TERO Codes that employers must adhere too:

- A. To ensure Native preference, employers need to submit and negotiate a detailed compliance plan of employer workforce needs with a TERO Compliance Officer.
- B. To utilize the TERO skills banks for all referrals and consider Native applicants before interviewing or hiring any Non-Native worker.
- C. To negotiate with the TERO Compliance Officer(s) the specific number of Natives in each job classification and to cooperate with tribal training programs to hire a certain number of trainees.
- D. To eliminate all extraneous job qualification criteria or personnel requirements which may act as a barrier to Native employment. TEROs are guided by EEOC guidelines for verifying legitimate Bona-fide Occupational Qualifications (BFOQ's).
- E. To keep in contact with the TERO office in order to resolve any employee problems and issues.
- F. To acknowledge and respect tribal religious beliefs and cultural difference and to cooperate with TERO to provide reasonable accommodations.
- G. All employers who have collective bargaining agreements with one or more unions must secure a written agreement from their unions indicating that they will comply with TERO.
- H. The TERO certified worker shall be treated the same as the other employees. There will be a Zero tolerance to discrimination within the boundaries of the Tulalip Reservation.

The success of TERO programs can be directly attributed to the fact that these programs embody all of the critical elements listed above.

4. *WHAT IS A COMPLIANCE PLAN?*

A Compliance Plan is a written document that provides detailed descriptions of a construction project with all the pertinent information. This is where you list your key personnel and your work force needs. A Key employee is a permanent employee who is in a supervisory or specialized position and without this person an employer would face a financial loss. This document is then negotiated with a TERO Compliance Officer for approval.

5. *WHAT TERO REQUIREMENTS ARE THERE IN CONTRACTING BIDS?*

The TERO Office has a Native American Owned Business Registry (NAOB) in which TERO certifies that the companies are owned by Native Americans. The TERO Code requires that Contractors and or Subcontractors provide opportunities to every NAOB that is qualified to do the work.

6. *IS THERE A DIFFERENCE BETWEEN TRIBAL AND NATIVE AMERICAN PREFERENCE?*

Yes, on Tribally funded projects TERO can require Tribal member preference. This is permissible under Federal law because tribes are exempt from Title VII of the Civil Rights

Act, Executive Order 11246 and most other employment rights legislation. Native American preference is permissible under some federal laws i.e., Indian Self Determination Act, Buy Indian Act and under most federal laws.

**7. WHAT IS THE EXTENT OF TERO JURISDICTION?**

A Tribe has the authority to enact and enforce any Indian employment preference law that is grounded in its inherent sovereign powers of self-government. This legal doctrine is the most basic principle of Indian law and is supported by a host of Supreme Court decisions. The jurisdiction is legally described or defined by treaty or legislation. The exterior boundaries of the reservation including cede territories and lands where jurisdiction has not been extinguished. TERO has a political preference, not a racial preference and does not violate Title VII or any other Federal Employment Law.

**8. ARE THERE ANY EXEMPTIONS TO TERO REQUIREMENTS?**

Yes, there are several exemptions. Direct employment by Federal / State governments, schools, churches and some non-profits are not covered by TERO. Some Tribes also exempt themselves from TERO coverage. It is important to note however, that any contract or sub-contract let by any of these entities is covered by TERO.

**9. WILL TERO INTERRUPT MY DAILY BUSINESS OPERATIONS?**

No. Since TERO is pro-active, the compliance plans are signed by TERO and the employer prior to the commencement of work prevents disputes. The Compliance Officers will monitor the TERO requirements by doing onsite compliance visits that would not be detrimental to business operations. TERO can sanction employers for violations which may shut down operations but only in severe disputes and in accordance with the applicable law.

**10. DOESN'T TERO DO AWAY WITH THE COMPETITIVE BIDDING PROCESS AND FAIR COMPETITION?**

No. It provides preference to certified and qualified Native American businesses on projects on or near the Tulalip Reservation. As with employment contracting preference is permissible or required under Federal, Tribal, State or other Local laws. Preference is not provided to the exclusion of other businesses. Price and quality are still primary considerations.

**11. ARE EMPLOYERS PROTECTED AGAINST UNFAIR TERO VIOLATION CHARGES?**

Yes. The first level of protection comes from the TERO Compliance Officer who handles the charge. These officers are trained to deal with facts and merits of the case before making determinations. Beyond the TERO Commission, grievant can seek relief in the Tribal and Federal Courts.

**12. WHAT SANCTIONS DO EMPLOYERS FACE FOR VIOLATIONS OF TERO?**

Violation of TERO requirements may result in severe sanctions. If the TERO office determines that employers willfully and intentionally breached TERO requirements. TERO may:

- A. Deny such party the right to commence business on the reservation;
- B. Impose a civil fine on such party ranging on most reservations anywhere from \$500.00 to \$5,000.00 per violation;
- C. Terminate or suspend party's operation and deny them the rights to conduct further business on the reservation; and or

- D. Order any party to dismiss any illegally hired Non-Natives, take action to ensure future compliance and to make back payment of any lost wages be paid to the TERO certified Native Americans.

**13. CAN SANCTIONS IMPOSED BY THE TERO COMMISSION BE APPEALED?**

Yes. Sanctions imposed by the TERO Commission can be appealed in tribal court. Appeals of tribal court decisions can be made to the federal court system.

It is important to note that only one appeal to a TERO commission and tribal court decision has ever been appealed to the federal court. The case ended at the Ninth

Circuit Court of Appeals and Appellate that upheld the TERO complaint and the Tribal Courts decisions.

**14. ARE TERO FEES LEGAL?**

Yes. Tribal authority to access a fee is equal to that of any government. Taxation, licenses and fees are a valuable source for financing Tribal governmental operations. Tribes therefore consider their social and economic needs and priorities and set the TERO requirements to suit them just as National, State, and other units of government do.

Many contractors without complaint pay taxes and comply with the governmental requirements of states, counties, etc., but openly oppose doing so with Tribes. This "cultural discrimination" is indicative of the lack of knowledge and acceptance of the sovereign authority of the Tribes. Employers can realize a substantial savings since Tribal taxes or fees pre-empt state or other local taxation on the reservation projects often to the benefit of the employer.

The Tulalip Tribes' TERO fee is 1.75% of total cost on any project over \$10,000.

TERO has the responsibility to ensure due process of the employer under the Tribal code and that only qualified and screened referrals are made to the employer.

**15. HOW HAVE VARIOUS FEDERAL, STATE AND OTHER AGENCIES VIEWED TERO IN THEIR OPERATION?**

When TERO first appeared in the late seventies there was opposition from some and difference from others. Over the past twenty years a great deal of progress has been made, some by direct legal action but most through pro-active, non-adversarial, synergistic effort. The results are Native American preference and TERO provisions, policies and procedures figure prominently in the following:

- A. The Civil Rights Handbook.
- B. The Job Training and Partnership Act.
- C. The Small Business Administration 8(a) Program.
- D. Public Law 93-638, The Indian Education Assistance and Self-Determination Act of 1974.
- E. HUD Regulations.
- F. BIA Acquisition Assistance Agreement 84-1.
- G. EEOC / TERO Contracts.
- H. OFCCP Indian Employment Initiative.
- I. FHWA ISTEA "Indians in Highway Construction Initiative".
- J. Indian Health Service Alaska Native Hiring Agreement.

K. US DOL/BAT Notice 84-1.

L. Indian Education Impact and Programs Under PL 81-815 (Construction) and PL 81-874 (OPS/Admin).

## **CONTRACTORS**

The following outlines the TERO expectations and responsibilities placed on all contractors and subcontractors doing work on or near the Tulalip Reservation. This document should be read carefully, along with the TERO Code. If you have any questions or concerns contact a TERO Compliance Officer.

### ***TERO ACKNOWLEDGMENT:***

Requirement: The contractor / employer must comply with all rules and regulations as set forth in the TERO Code. This agreement will be affirmed in writing and will be signed and dated by the TERO Manager. Furthermore, if a project is expected to be of one month duration or more, the contractor must arrange a pre-construction meeting with the TERO Manager or TERO Compliance Officers prior to submitting a Compliance Plan to the TERO department.

### ***TERO LIAISON:***

Requirement: All contractors and employers must designate a responsible company official to coordinate all employment, training and contracting related activities with the TERO department to ensure that the company is in compliance with the TERO Code during all phases of the project.

### ***NATIVE AMERICAN OWNED BUSINESS REGISTRY:***

Requirement: The TERO Office maintains a certified Native American Owned Business Registry. All the businesses on the registry need to be given the opportunity to bid on any projects that they are qualified for. If they are within ten-percent (10%) of the lowest bid, you need to negotiate to see if they can reduce their price. But the fact remains that the bid will be awarded on: price, quality and capability unless other requirements are set forth in the bid documents.

### ***TERO COMPLIANCE PLAN:***

Requirement: All contractors, sub-contractors and or employers must have an approved written compliance agreement filed, negotiated and approved by the TERO Office prior to commencement of any construction activities on the Tulalip Reservation. There is a 1.75% TERO fee on any projects over \$10,000 to be paid in full or negotiated with the TERO Compliance Officers.

### ***COMPLIANCE PLAN WORKFORCE/ KEY EMPLOYEE:***

Requirement: Contractors and or Employers shall be required to hire and maintain as many TERO / Native American preference employees as apply for and are qualified for each craft or skill.

Exception: Prior to commencing work on the Tulalip Reservation the prospective employer, contractor and subcontractors shall identify key and permanent employees.

Key employee: One who is in a top supervisory position or performs a critical function such that an employer would risk likely financial damage or loss if that task were assigned to a person unknown to the employer. An employee who is hired on a project by project basis may be considered a key employee so long as they are in a top supervisory position or perform a critical function.

Permanent employee: One who is and had been on the employers' or contractors' annual pay roll for a period of one year continuously, working in a regular position for the employer, or is an owner of the firm. An employee who is hired on a project by project basis shall not be considered a permanent employee.

Non-preferred Permanent and Key Employee(s) shall not exceed 20% of the workforce. Permanent and Key employees are subject to TERO approval and TERO may require a position to be opened up to all preference workers.

***TERO HIRING HALL & RECRUITMENT EFFORTS:***

Requirement: Contractor or employer is required to contact the TERO Office for recruiting and placement services on all non-key positions. The TERO Office shall be given a minimum of seventy-two (72) hours to furnish a qualified referral. Furthermore contractors and employers are required to provide TERO with a written list of their projected workforce needs, job classifications, openings, hiring policies, rate of pay, experience / skill requirements, employment screening procedures and anticipated duration of employment.

***NATIVE PREFERENCE:***

Requirement: All contractors, businesses and employers operating within the boundaries of the Reservation, or on Tribal projects off the reservation shall give preference in hiring, promotion, training, layoffs, recall, and all other aspects of employment, unless other contractual agreements or federal requirements restrict the preference specified below. The order of preference shall be given to the following persons in the following enumerated order:

- 1) Enrolled Tulalip Tribal Members
- 2) Spouses, Parent of a tribal member child, biological child born to an enrolled Tulalip Tribal Member, current legal guardian of a Tribal Member dependent child (with a proper letter of temporary or permanent legal guardianship from a court), or a tribal member in a domestic partner relationship (with documentation).
- 3) Other Natives/Indians shall mean any member of a federally recognized Indian tribe, nation or band, including members of federally recognized Alaskan Native villages or communities.
- 4) Spouse of federally recognized Native American
- 5) Regular current employees of the all Tulalip Tribal entities
- 6) Other

Exception: Where prohibited by contractual agreements or federal requirements, the above order of preference set out in subsection 1.8, shall not apply. In such cases preference shall be given in accordance with the applicable contractual agreement, federal requirement, or Federal Law.

Requirement: If the TERO Office is unable to refer an adequate number of qualified, preferred employees for a Contractor, TERO will notify the Contractor who may fill the remaining positions with non-TERO workers. When this occurs, TERO work permits may be valid for one month from the date of issuance and may be renewed. Work permits are non-transferable.

Requirement: When work permits are issued, the contractor is still required to notify the TERO Office of all future job openings on the project so that qualified, preferred employees have an opportunity to be dispatched.

***JOB QUALIFICATIONS, PERSONNEL REQUIREMENTS & RELIGIOUS ACCOMMODATIONS:***

Requirement: An employer may not use any job qualification criteria or personnel requirements which serve as barriers to the employment of Natives which are not required by business necessity. The TERO department will review the job duties and may require the employer to eliminate the personnel requirements at issue. Employers shall also make reasonable accommodation to the religious beliefs and cultural traditions of Native workers.

**TRAINING:**

Requirement: Contractors and or Employers may be required to develop on the job training opportunities and or participate in Tribal or local training programs, including upgrading programs, and apprenticeship or other trainee programs relevant to the employer's needs.

**LAY-OFFS:**

Requirement: TERO preference employees shall not be laid off where non-TERO preference employees are still working. If the employer lays-off employees by crews, classifications or other categories, qualified TERO preference employees shall be transferred to crews or positions that will be retained. This section does not apply to key or permanent employees.

*NOTE: The TERO Office is here to help in any way we can. Communication with the TERO Compliance Officers is very important in that it will help ensure the job to run smoothly.*

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# THE TULALIP TRIBES OF WASHINGTON CONTRACT AGREEMENT

## FOR MBR TREATMENT FACILITY UPGRADE

### TULALIP TRIBES BID SOLICITATION NO. 17-004

This agreement entered into this \_\_\_\_th day of \_\_\_\_\_, 2018, between The Tulalip Tribes of Washington, 8802 27th Avenue, Tulalip, WA, 98271 hereinafter referred to as "Tulalip Tribes", and \_\_\_\_\_, \_\_\_\_\_ <insert Company name and address> hereinafter referred to as "Contractor".

**WITNESSETH**, that the Contractor and the Tulalip Tribes for the consideration stated herein mutually agree as follows:

### SECTION ONE DESCRIPTION OF WORK

This Contract consists of this written agreement and all appurtenant "contract documents" described in Section Six of this agreement. Contractor shall perform the following described work in accordance with this contract and the Scope of Work, incorporated as Bid Package No. 17-004 – MBR Treatment Facility Upgrade. This Tulalip Tribes project provides for the upgrades to the MBR Treatment Facility. Refer to Bid Proposal Form for Schedule A and B individual award dates. The project includes

1. Supply and installation of a headworks drum screen.
2. Supply and installation of two blowers, sanitary sewer piping, and supports.
3. Supply and installation of Kubota submerged membrane units (SMUs) in MBR tanks. Supply includes all piping up to and including air and permeate 2-inch isolation valves.
4. Stainless steel and ductile iron pipe supply and installation.
5. Supply and installation of electrical motor control center (MCC), duct banks, conduit, and fiber optic cable.
6. All incidental and related work to complete.

The project is located on the Tulalip Tribes Reservation and within the City of Marysville.

### SECTION TWO CONTRACT PRICE

The Tulalip Tribes agrees to pay Contractor for the Work described a total contract price of \$ \_\_\_\_\_. Payment of this amount is subject to additions or deductions in accordance with the bid unit price amounts listed in the schedule below, provisions of this contract and of any other documents to which this contract is subject. Contractor shall be entitled

to full payment when contract work is completed and approved by the Tulalip Tribes. Progress payments shall be made to the Contractor in accordance with the provisions of Section Three of this Contract.

All prices are on the Bid Proposal Form.

### **SECTION THREE PAYMENTS**

The Tulalip Tribes shall make payment for a phase of the work to the Contractor no later than thirty (30) days after the Tulalip Tribes' accounting department begins processing Contractor's invoice for that work. Such processing shall begin after Contractor presents the invoices and deliverables to the Tulalip Tribes' authorized representative and the authorized representative submits written approval to the accounting department for payment based on an inspection of the work. Payment by the Tulalip Tribes does not constitute a waiver of any claims by the Tulalip Tribes against Contractor concerning or arising out of this agreement. Acceptance of final payment by Contractor constitutes a waiver of all claims by Contractor.

Contractor agrees to maintain for inspection by the Tulalip Tribes for three years after final payment all books, records, documents, and other evidence pertaining to the costs and expenses of this agreement, hereinafter collectively called, "records", to the extent and in such detail as will properly reflect all net costs, direct and indirect, of labor, supplies, and services, and other costs of whatever nature for which reimbursement is claimed under the provisions of this agreement.

In the event payment for work performed under this agreement is made from federal or state funds, Contractor shall abide by all applicable federal and state laws and regulations governing such funds which laws and regulations are hereby incorporated by reference. Any rights of the Contractor are subject to the limitations on and availability of such funds to the Tulalip Tribes.

Contractor shall not be entitled to any interest on any amount found due and owing hereunder, whether before or after judgment, but shall, at most, only be entitled to the amount specified in Section Two – CONTRACT PRICE.

### **SECTION FOUR STARTING AND COMPLETION DATES**

The date of commencement of the work shall be the date of this agreement unless a different date is made for the date to be fixed in a notice to proceed issued by the Tulalip Tribes. This agreement shall become effective upon its signing by the Tulalip Tribes and Contractor.

The contract time shall be measured from the date of commencement.

The Contractor shall diligently prosecute the Work and shall complete all Work so that Contract Substantial Completion occurs not later than 185 working days for Schedule A and 250 working days for Schedule B from each of their dates of commencement, unless the Contractor timely requests and The Tulalip Tribes grant an extension of time in accordance with the Contract Documents. The Contractor shall complete **all** Work so that the Contract Physical Completions

occur not later than 200 working days for Schedule A and 265 working days for Schedule B from each of their dates of commencement.

It is understood and agreed that all Work shall be completed within the established time for Contract Completion, and that each applicable portion of the Work shall be completed upon the respective milestone completion date(s), unless the Contractor timely requests and the Tulalip Tribes grants an extension of time in accordance with the Contract Documents.

## **SECTION FIVE LIQUIDATED DAMAGES**

Upon failure to have all Work completed within the period of time above specified, or failure to have the applicable portion of the Work completed upon any milestone completion date, the Tulalip Tribes shall be entitled to retain or recover from the Contractor, as Liquidated Damages, and not as a penalty, the applicable amount set forth in the 2016 WSDOT Standard Specifications and the Special Provisions for each and every day or portion of a day thereafter until Contract Completion, unless the Contractor timely requests and the Tulalip Tribes grants an extension of time in accordance with the Contract Documents.

The amount of Liquidated Damages is agreed upon by and between the Contractor and the Tulalip Tribes because of the impracticality and extreme difficulty of ascertaining the actual amount of damage the Tulalip Tribes would sustain.

## **SECTION SIX CONTRACT DOCUMENTS**

The contract documents includes the following, which are incorporated by reference as if fully set forth herein (not in order of precedence), on which the agreement between the Tulalip Tribes and Contractor is based, in accordance with which the work is to be done, are as follows:

- a. This agreement, together with such supplementary agreements and conditions as are attached hereto;
- b. Proposal (Form of Bid);
- c. Table of Contents;
- d. Division 0 – Bidding Requirements, Contract Forms, and Conditions of the Contract complete;
- e. Division 1 – General Requirements complete;
- f. Technical Specifications complete;
- g. Special Provision Complete;
- h. Amendments to the 2016 WSDOT Standard Specifications (8/7/17);
- i. 2016 WSDOT Standard Specifications;
- j. Contract Plans as listed in the Index on pages IN-1 & IN-2 of the Drawing Set complete  
Volume 3 contains sheets 1-238;
- k. Appendix A Wage Rates
- l. Appendix B Geotechnical Reports –  
for reference use only and are provided solely to share information available to the  
Contacting Agency and any use of, or reliance upon, such items by the Contractor is  
at the risk of the Contractor
- m. The Tulalip Code, Chapter 9.05 – TERO Code;
- n. Addendum No. \_\_\_\_\_ dated \_\_\_\_\_, 20\_\_\_\_; and
- o. Addendum No. \_\_\_\_\_ dated \_\_\_\_\_, 20\_\_\_\_.

These contract documents together form the contract for the work herein described. The parties intend that the documents include provisions for all labor, materials, equipment, supplies, and other items necessary for the execution and completion of the work and all terms and conditions of payment. The documents also include all work and procedures not expressly indicated therein which are necessary for the proper execution of the project.

This agreement, including its referenced appendices, represents the entire and complete agreement between the parties and supersedes all prior negotiations, representations, or agreements either written or oral and may be amended or modified only in writing signed by both parties. Nothing whatsoever in this agreement constitutes or shall be construed as a waiver of the Tulalip Tribes of Washington's sovereign immunity. This agreement shall not be valid unless each and every signature designated below is affixed.

## **SECTION SEVEN AUTHORITY OF TULALIP TRIBES' REPRESENTATIVE(S)**

The Tulalip Tribes' representative designated as Construction Manager authorized to administer and implement the terms and conditions of this agreement is \_\_\_\_\_.

The Tulalip Tribes' representative designated as Project Engineer authorized to directly supervise the engineering and administration of the construction project is \_\_\_\_\_ [<insert Company name and address>](#).

The Tulalip Tribes' representative designated as Inspector authorized to inspect Contract performance in detail is \_\_\_\_\_ [<insert Company name and address>](#).

The Tulalip Tribes' authorized representatives shall be allowed to observe any work done by the Contractor which is covered by this agreement.

## **SECTION EIGHT RESPONSIBILITIES OF CONTRACTOR**

Contractor's duties and rights in connection with the project herein are as follows:

- a. Responsibility for and supervision of work. Contractor represents that he has inspected and is familiar with the work site and the local conditions under which the work is to be performed. Contractor shall be solely responsible for all construction and installation in accordance with the contract, including the techniques, sequences, procedures, and means for coordination of all work. Contractor shall properly supervise and direct the work of the employees and subcontractors, and shall give all attention necessary for such proper direction. Contractor represents that he is bonded in sufficient amount to cover Contractor's liability occasioned by Contractor's performance of this contract.
- b. Discipline and employment. Contractor shall maintain at all times strict discipline among his workers and agrees not to employ for work on the project any person unfit or without sufficient skill to perform the job for which he was employed.

- c. Furnishing of labor, materials, etc. Contractor shall provide and pay for all labor, materials and equipment, including but not limited to tools, construction equipment, machinery, utilities including water, transportation, and all other facilities and services necessary for the proper completion of the work on the project in accordance with the contract documents.
- d. Manufacturer's instructions. Contractor shall comply with manufacturer's installation instructions and recommendations to the extent that those instruction and recommendations are more explicit or stringent than requirements contained within the Contract documents.
- e. Payment of taxes, procurement of license and permits. Contractor shall pay any taxes required by law in connection with work on the project and shall secure all licenses and permits necessary for proper completion of the work, paying the fees therefore.

The Tulalip Tribes of Washington is a federally recognized Indian Tribal government with a constitution and bylaws approved by the United States Secretary of the Interior. See: 65 Federal Register 13298, 13301 (March 13, 2000). As a recognized tribal government, the Tulalip Tribes of Washington and all of its governmental agencies, is a tax exempt entity. See: 26 USC §7871, and Washington Administrative Code Excise Tax Rule 192 (WAC 458-20-192). Portions of this project are Tax Exempt from all Sales and/or Use Taxes for all materials and supplies incorporated in construction of the work that become a permanent part of the Project. Upon request a Tax Exemption form may be obtained from the Tulalip Tribes. WAC 458-20-192(5)(a)(ii) states that retail sales tax is not imposed if the retail service (e.g. construction services) is performed for the member or tribe in Indian country. In the case of retail service that is performed on and off Indian country, only the portion of the contract that relates to work done in Indian country is excluded from tax. The work done for a tribe or Indian outside of Indian country, for example a road work that extends outside of Indian country, is subject to retail sales tax.

- f. Compliance with laws and regulations. Contractor shall comply with all applicable laws and ordinances, and rules, regulations, or orders of all public authorities relating to the performance of the work herein. If any of the contract documents are at variance therewith, he shall notify the Tulalip Tribes, through the Construction Manager, promptly on discovery of such variance.
- g. Responsibility for negligence of employees and subcontractors. Contractor assumes full responsibility for acts, negligence, or omissions of all other persons doing work under a contract with him.
- h. Warranty of fitness of equipment and materials. Contractor represents and warrants to the Tulalip Tribes that all equipment and materials used in the work and made a part of any structure thereon, or placed permanently in connection therewith, will be new unless otherwise specified in the contract documents, of good quality, free of defects, and in conformity with the contract documents. It is understood between the parties that all equipment and materials that are not so in conformity are defective.
- i. Cleaning and protection. Contractor shall during handling and installation clean and protect construction in progress and adjoining materials in place. Contractor shall apply protective covering where required ensuring protection from damage or deterioration.

- j. Furnishing of design and engineering plans. Upon request Contractor shall furnish the Tulalip Tribes or Construction Manager all design and engineering plans for consideration and approval as to conformance with the specifications of the Contract documents.
- k. Clean-up. Contractor agrees to keep the work premises and adjoining way free of waste materials and rubbish caused by his work or that of his subcontractors, and further shall remove all such waste materials and rubbish on termination of the project, together with all his tools, equipment and machinery.
- l. Indemnity and hold harmless agreement. Contractor agrees to indemnify and hold harmless the Tulalip Tribes, its employees, and their agents from and against all claims, damages, losses, and expenses including reasonable attorney fees in case it shall be necessary for the Tulalip Tribes to commence or defend any action arising out of or associated in any way with performance of the work herein, which is:
  - 1. For bodily injury, illness or death, property damage including loss of use, or other damage, and
  - 2. Caused in whole or part by Contractor's negligent act or omission, or that of a subcontractor, or that of anyone employed by them or for whose acts Contractor or subcontractor may be liable.
- m. Contractor shall defend, indemnify and hold harmless the Tulalip Tribes, its employees, and their agents against all loss, damage, liability, claims, lawsuits demands, or costs arising in connection with this agreement. Contractor shall reimburse the Tulalip Tribes for all costs reasonably incurred to defend the Tulalip Tribes against such claims through attorneys of the Tulalip Tribes' choice.
- n. Contractor shall promptly notify the Tulalip Tribes, through the Construction Manager, of any litigation arising from or affecting its operations under this agreement, including any bankruptcy or insolvency proceedings of Contractor or of its assignees or subcontractors. Contractor shall not assign its rights under this agreement without first obtaining the Tulalip Tribes' written approval.
- o. Payment of royalties and license fees; hold harmless agreements. Contractor agrees to pay all royalties and license fees necessary for the work and to defend all actions and settle all claims for infringement of copyright or patent rights, and to save the Tulalip Tribes harmless therefrom.
- p. The Contractor will be required as part of this contract to provide weekly certified payrolls and be in compliance with the Tribal Employment Rights Office (TERO) requirements. The Contractor shall be required to schedule a meeting with TERO prior to the start of work on this project and provide a signed approved copy of their Compliance Plan to the Construction Manager.
- q. Archaeological and Historical Objects. Archaeological or historical objects, which may be encountered by the Contractor, shall not be further disturbed. The Contractor shall immediately notify the Construction Manager of any such finds. The Construction Manager will contact the Tribal Natural Resource and Cultural Resource Department who will determine the nature of the object(s). The Contractor may be required to stop work in the vicinity of the discovery until such determination is made. If the Tribal representative determines that the object(s) are to be surveyed, the Tribal representative may require the Contractor to stop work in the vicinity of the discovery until the survey is accomplished.

- r. Excess material. All excess material shall become the property of the Tulalip Tribes.
- s. The Contractor shall, whether or not federal or state funds are involved, without additional expense to the Tulalip Tribes, comply with all applicable laws and obtain all required licenses and permits necessary to execute the provisions of this agreement. Contractor shall file all required returns and notices.
- t. When working within the exterior boundaries of the Tulalip Indian Reservation, Contractor shall comply with all Tribal laws. Before commencing work, Contractor shall obtain all required Tribal licenses and permits. Contractor shall indemnify and hold the Tulalip Tribes, its employees, and their agents harmless from any and all costs, liabilities, or obligations by reason of the failure of Contractor or his or her employees, agents, subcontractors or assigns to comply with any applicable law.
- u. Contractor shall not discriminate against any employee or applicant for employment on the basis of race, color, religion, age, sex, national origin, or handicap, with regard to employment "upgrading, demotion, transfer, recruitment, advertising, layoff, termination, rates of pay, or other forms of compensation and selection for training. Notwithstanding the foregoing, Contractor shall provide preference in employment and subcontracting in accordance with The Tulalip Code, Chapter 9.05 – TERO Code as it now exists or may be hereafter amended.

## **SECTION NINE TIME OF ESSENCE – EXTENSION OF TIME**

All times stated herein or in the contract documents are of the essence hereof. Contract times may be extended by a change order from the Tulalip Tribes, through the Construction Manager, for such reasonable time as the Tulalip Tribes may determine when in their opinion Contractor is delayed in work progress by changes ordered, labor disputes, fire, prolonged transportation delays, injuries, or other causes beyond Contractor's control or which justify delay.

Any request by the Contractor for an extension of time shall be made in writing to the Tulalip Tribes, through the Construction Manager, no more than ten (10) days after the initial occurrence of any condition which, in the Contractor's opinion, entitles the Contractor to an extension of time. Failure to timely provide such notice to the Tulalip Tribes shall constitute a waiver by the Contractor of any claim for extension, damages or mitigation of Liquidated Damages, to the fullest extent permitted by law.

## **SECTION TEN CORRECTING NON-CONFORMING WORK**

If a portion of the work is covered contrary to the Construction Manager's request or to requirements specifically expressed in the Contract documents, it must, if requested in writing by the Construction Manager, be uncovered for the Construction Manager's and or Architect's examination and be replaced at the Contractor's expense without change in the Contract time.

If a portion of the Work has been covered which the Construction Manager has not specifically requested to examine prior to its being covered, the Construction Manager may request to see such work and it shall be uncovered by the Contractor. If it is determined that such work has been performed in accordance with the Contract documents all costs incurred by Contractor to uncover and replace the work shall, by appropriate change order, be reimbursed by

the Tulalip Tribes. If such work is found not to be in accordance with the Contract documents, any and all required corrections shall be assigned to the Contractor unless the condition was caused by the Tulalip Tribes or a separate contractor in which event the Tulalip Tribes shall be responsible for payment of such costs.

When it appears to any authorized representative of the Tulalip Tribes or Contractor during the course of construction that any work does not conform to the provisions of the contract documents, Contractor shall make necessary corrections so that such work will so conform, and in addition Contractor will correct any defects caused by him or by a subcontractor, appearing within one year from the date of issuance of a certificate of Contract completion by the Tulalip Tribes, or within such longer period as may be prescribed by law or as may be provided for by applicable special guarantees in the contract documents.

## **SECTION ELEVEN CHANGES IN THE WORK**

The Tulalip Tribes reserves the right to order changes in the work in the nature of additions, deletions or modifications, without invalidating the Contract, and agrees to make corresponding adjustments in the Contract price and time for completion, if justified. Any such changes will be authorized by a written change order signed by an authorized representative of the Tulalip Tribes. The change order will include conforming changes in the Contract and completion time. Work shall be changed, and Contract price and completion time shall be modified only as out in the written change order. Any adjustment in the Contract price resulting in a deductive credit or a charge to the Tulalip Tribes shall be determined by the mutual agreement of the parties to the Contract.

## **SECTION TWELVE TERMINATION**

The Tulalip Tribes may terminate this agreement on ten (10) days written notice and in such case Contractor shall only be entitled to payment for work performed prior to receipt of said notice. Additionally, the Tulalip Tribes may immediately suspend operations under this agreement by written notice of any breach. Suspension shall continue until the Tulalip Tribes' authorized representative certifies in writing that the breach is remedied. If Contractor is still in breach after seven (7) days from the notice of suspension, the Tulalip Tribes may, without further notice, terminate all rights of Contractor under this agreement.

Any failure by the Tulalip Tribes to suspend or terminate this agreement in case of breach shall not waive Contractor's duty to perform strictly in accordance with this agreement. Failure by Contractor to perform on its part any duty, term or condition herein shall constitute a breach.

Any notice sent under this Section may either be sent by personally giving a copy thereof to Contractor or its agents, employer or contractors or mailing a copy to the address set forth herein.



## **SECTION THIRTEEN DISPUTES**

Tulalip Tribes' Limited Waiver of Sovereign Immunity; Consent to Jurisdiction. By signing this contract, The Tulalip Tribes neither waives, limits, nor modifies its sovereign immunity from any lawsuit, except as expressly provided in this Section Thirteen. The Tulalip Tribes hereby expressly and irrevocably waives its sovereign immunity (and any defense based thereon) for arbitration of Claims arising out of or related to this contract, but only pursuant to subsections (b), (c), (d), (e) and (f) below, and to that extent, irrevocably consents to and submits itself to the jurisdiction of the tribal court of The Tulalip Tribes ("Tribal Court") for the purposes of compelling arbitration of a Claim, confirming an arbitration award or collecting sums due and owing pursuant to and otherwise enforcing any award or judgment. This limited waiver and consent are expressly limited to the following limitations and qualifications:

- a. If the parties do not resolve any dispute through direct negotiation, either party shall submit the matter to mediation with a professional mediation service mutually agreed upon by the parties, as a condition precedent to arbitration. Persons with authority to resolve the dispute shall be present at the mediation. If the parties do not otherwise agree on a mediation service to conduct the mediation, the mediation shall be conducted in accordance with the Construction Industry Mediation Rules of the American Arbitration Association. The parties shall share the mediator's fee, filing fees and associated costs equally.
- b. If, within 30 days of any such submission by either party, the mediation has not resulted in a resolution of the dispute, either party may submit the dispute to binding arbitration in accordance with the Construction Industry Rules of the American Arbitration Association and the Federal Arbitration Act; provided, however, that the party demanding arbitration shall serve upon the other party, personally or by registered mail, a written notice of intention to arbitrate. Such notice must state in substance that unless within (20) twenty days after its service, the party served therewith shall file a motion to stay the arbitration, such party shall thereafter be barred from putting in issue the existence or validity of the Agreement or the agreement to arbitrate.
  1. The Construction Industry Rules of the American Arbitration Association, R-51(c) shall be amended to read: "parties to these rules will be deemed to have consented that judgment upon the arbitration award may be entered in the Tulalip Tribal Court;"
- c. In the event arbitration to resolve a dispute is necessary, the party seeking arbitration shall send a written notice that shall contain a detailed written statement of the claim and the parties shall meet as soon as practicable but not less than thirty (30) days after receipt of the written notice and attempt to agree on an arbitrator to decide the matter at issue.
- d. Selection of the arbitrators shall be pursuant to the following:
  1. Any such arbitration shall take place before a single arbitrator if the aggregate value of the Claim and any counterclaim is less than \$200,000, exclusive of costs and attorney fees. The parties shall endeavor to mutually agree on the arbitrator. Either party may specify and require that the arbitrator selected be an attorney licensed to practice law in the State of Washington and shall be experienced in the field of construction. If the

parties are unable to agree upon the selection of an arbitrator within twenty (20) days of their first meeting, the parties shall each select an arbitrator and the two selected arbitrators shall together select a third arbitrator who alone shall decide the matter in dispute. For any Claim and counterclaim having an aggregate value of \$200,000 or more, a panel of three (3) arbitrators shall be appointed unless both parties mutually agree to a single arbitrator. Each of the parties shall designate one arbitrator and the third arbitrator, who shall be a lawyer with experience in construction disputes, shall be selected by the arbitrators designated by the parties. If the two selected arbitrators are unable to agree on a third arbitrator, the third arbitrator shall be appointed by the Chief Judge of the Tulalip Tribal Court.

- e. Following the initiation of arbitration, the parties shall cooperate in the exchange of information relating to the Claim, being guided by the scope of the applicable rules of discovery under the Federal Rules of Civil Procedure for the Federal District Courts including the local rules adopted by the Western District of Washington. Discovery shall not include interrogatories or requests for admission. The parties shall freely exchange documents relevant to the Claim and depositions shall be limited to those reasonably necessary for each party to prepare for or defend against the Claim. Disputes regarding discovery shall be resolved by the arbitrator or, where there is an arbitration panel, by the Chair.
- f. Arbitration may include by consolidation, joinder or in any other matter, an additional person or entity who is, or may be involved in, the Claim, including but not limited to the Designer of Record, lower-tiered contractors and/or suppliers, and consultants retained by the Designer of Record or Contractor. In order to effectuate the purposes of this Section Eleven, (f), the Contractor shall incorporate by reference the provisions of this Section Eleven, (f) in each lower-tiered contract.
- g. In the event of arbitration between the parties hereto, declaratory or otherwise relating to the Contract Documents, and notwithstanding any other provisions therein, (1) each party shall bear its own costs and attorneys' fees if the aggregate value of the Claim and any counterclaim is less than \$200,000 and (2) the losing party shall pay all costs and attorneys' fees actually incurred by the substantially prevailing party if the aggregate value of the Claim and any counterclaim is \$200,000 or more. The parties covenant and agree that they intend by clause (2) of the preceding sentence to award the amount of attorney's fees actually incurred by the prevailing party, and that said clause (2) shall constitute an instruction to the Arbitrator that such fees shall be deemed reasonable.
- h. A demand for arbitration shall be made within the time limits specified in this Section Thirteen as applicable, and in other cases within a reasonable time after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations as determined pursuant to subsections (h.1), (h.2) and (h.3) below:
  - 1. Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;

2. Between Substantial Completion and Final Certificate for Payment. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and
  3. After Final Certificate for Payment. As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any Contract Warranty provisions, the date of any correction of the Work or failure to correct the Work by the Contractor under the Contract Corrections of the Work provisions, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Tulalip Tribes, whichever occurs last.
- i. Claims and Timely Assertion of Claims. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.
  - j. Judgment on Final Award. The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in the tribal court of The Tulalip Tribes of Washington.
  - k. This limited waiver of sovereign immunity is solely for the benefit of the Contractor (and Subcontractors whose claims are sponsored by the Contractor, if any) and surety, and The Tulalip Tribes, by granting this limited waiver to the Contractor and surety, does not otherwise waive its sovereign immunity.
  - l. The award rendered by the arbitrator shall be final. Judgment on any arbitration award may be entered in and enforced by the Tribal Court as provided in this section. The Contractor and The Tulalip Tribes shall comply with the arbitration award and shall not seek further remedy or appeal.

#### **SECTION FOURTEEN EMPLOYMENT PREFERENCE**

Contractor recognizes and agrees that Contractor and Contractor's subcontractors are bound by The Tulalip Code, Chapter 9.05 – TERO Code.

#### **SECTION FIFTEEN CONTRACTING PREFERENCE**

Contractor recognizes and agrees that Contractor and Contractor's subcontractors are bound by The Tulalip Code, Chapter 9.05 – TERO Code.

## **SECTION SIXTEEN CONTRACT INSURANCE**

### **CONTRACTOR'S LIABILITY INSURANCE**

Contractor shall purchase and maintain such liability and other insurance as will protect the Tulalip Tribes, WSDOT, and the Contractor from claims or losses which may arise out of or result from the Contractor's performance or obligations under the contract documents, whether due to action or inaction by the Contractor or any person for whom the Contractor is responsible. Contractor shall provide insurance coverage and limits as indicated in the Special Provisions, Section 1-07.18 Public Liability and Property Damage Insurance

### **CONTRACTOR'S WORKER'S COMPENSATION**

All employees of Contractor and subcontractor(s) are to be insured, including qualified self-insured plans, under Washington State Industrial Insurance as well as in compliance with any Federal workers compensation regulations including USL&H and Jones Act Coverages. Employees not subject to the State Act are to be insured under Employer's Contingent Liability (Stop Gap) \$1,000,000 on accident and aggregate.

Such evidence of insurance shall be in the form of an Insurance Certificate issued by the State of Washington Department of Labor and Industries or an insurer satisfactory to the Tulalip Tribes and shall provide for not less than thirty (30) days prior written notice to the Contacting Agency of cancellation or reduction in coverage.

### **BUILDER'S RISK**

The Tulalip Tribes shall provide and maintain, during the progress of the work and until the execution of the certificate of Contract Completion, a Builder's Risk Insurance policy to cover all on-site work in the course of construction including false work, temporary buildings and structures and materials used in the construction process. The amount of coverage is based upon the total completed value of the project (including the value of permanent fixtures and decorations.) Such insurance shall be on a special cause of loss form and may include such other coverage extension as the Tulalip Tribes deem appropriate. Unless otherwise provided for through agreement, the contractor experiencing any loss claimed under the Builder's Risk policy shall be responsible for up to \$10,000 of that loss. Contractor may provide its own builder's risk or installation insurance coverage for amounts up to the \$10,000 deductible. Contractor is responsible for insuring their property in transit, in temporary storage away from the site as well as their own tools, equipment and any employee tools.

Incidents related to pollution and contamination are specifically excluded from the Builders Risk Insurance policy.

To be eligible to make a claim under the Tulalip Tribes' Builders Risk Insurance policy, Contractor shall be responsible to secure all materials and or equipment stored on the project site in a secured fenced area.

## **SECTION SEVENTEEN OTHER PROVISIONS**

Any and all reports, data, findings or other materials or deliverables under this agreement shall become the property of and remain under the sole proprietorship of the Tulalip Tribes. Contractor will keep all information learned under this agreement confidential and will not release

any such information, either orally or in writing, to parties other than the Tulalip Tribes, its agents, contractors or employees without the express written permission of the Tulalip Tribes.

The Tulalip Tribes and Contractor each binds themselves and their partners, agents, assigns, successors and legal representatives of such other party to this agreement and to the partners, successors and legal representatives of such other party with respect to all terms and conditions of this agreement.

Neither the Tulalip Tribes nor Contractor shall delegate, assign, sublet or transfer their duties or interest in this agreement without the written consent of the other party. Any such assignment, sublet, delegation or transfer shall be subject to the same terms and conditions as this agreement.

The negotiation and execution of this agreement shall be deemed by the parties to have occurred within the exterior boundaries of the Tulalip Indian Reservation and any interpretation thereof shall be in accordance with the laws of the Tulalip Tribes of Washington.

The failure of the Tulalip Tribes to assert any claim or right at any time under this agreement shall not waive its right to assert any claim or right at a later time.

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IN WITNESS WHEREOF, the parties have executed this agreement at the Tulalip Indian Reservation, Washington, on the date first above written.

**APPROVED BY CONTRACTOR:**

\_\_\_\_\_

(Company Name)

\_\_\_\_\_

(Print Name & Title)

By: \_\_\_\_\_

(Authorized Signature)

**APPROVED BY THE TULALIP TRIBES OF WASHINGTON:**

\_\_\_\_\_

(Print Name & Title)

By: \_\_\_\_\_

(Authorized Signature)

The Tulalip Tribes of Washington  
MBR Treatment Facility Upgrade Project

**INTERIM WAIVER AND RELEASE OF CLAIMS**

TO THE TULALIP TRIBES OF WASHINGTON ("OWNER"):

\_\_\_\_\_ (the "Releasing Party") has furnished labor or services, or supplied materials or equipment (collectively, the "Work") for construction on the MBR Treatment Facility Upgrade (the "Project"), located at the intersection of George Williams Senior Avenue NE and 91st Street NE, Tulalip, WA 98271.

Upon receipt of payment by the Releasing Party of \$\_\_\_\_\_, whether in cash, by check or by joint check, the Releasing Party represents and certifies to Owner that: (i) Releasing Party and all of its subcontractors are in compliance with the terms of their respective contracts; (ii) all due and payable bills with respect to the Work have been paid to date or are included in the amount requested in the current Application for Payment and there is no known basis for the filing of any claim in respect of the Work except for (a) any claim that the Releasing Party has previously provided written notice to Owner about such claim, and (b) amounts owed to Releasing Party and/or any subcontractor or supplier that are considered Cost of the Work but have been withheld by the Owner; and (iii) waivers and releases from all Subcontractors and/or Suppliers being billed under a Releasing Party Subcontract Agreement or Purchase Agreement have been obtained in form substantially similar hereto as to constitute an effective waiver and release of all known claims. Notwithstanding the foregoing, this Interim Waiver and Release of Claims shall not apply to any amounts owed for Work which has been provided to the Project during a billing period prior to the date hereof where Releasing Party and/or any subcontractor or supplier has not yet requested reimbursement for the cost of the Work provided to the Project.

If any claim covered by this Interim Waiver and Release of Claims is made or filed by the Releasing Party or any of its lower tier consultants, subcontractors, suppliers, vendors or materialmen at any tier against or with respect to Owner or the Project then the Releasing Party (1) shall immediately release and discharge, or secure the release or discharge of, such claim and (2) shall indemnify, defend and hold harmless Owner and the Project from and against any and all costs, damages, expenses, court costs and attorney fees arising from such claim or any litigation resulting from such claim.

\_\_\_\_\_  
(the Releasing Party)

DATED: \_\_\_\_\_

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Its: \_\_\_\_\_

[Notary Seal]

State of: \_\_\_\_\_ County of: \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_

Notary Public: \_\_\_\_\_

My Commission expires: \_\_\_\_\_

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The Tulalip Tribes of Washington  
MBR Treatment Facility Upgrade Project

**FINAL WAIVER AND RELEASE OF CLAIMS**

TO THE TULALIP TRIBES OF WASHINGTON ("OWNER"):

Upon receipt of payment of \$\_\_\_\_\_, whether in cash, by check or by joint check, \_\_\_\_\_ (the "Releasing Party") has furnished labor or services, or supplied materials or equipment for construction on the MBR Treatment Facility Upgrade (the "Project"), located at the intersection of George Williams Senior Avenue NE and 91st Street NE, Tulalip, WA 98271.

The Releasing Party hereby unconditionally waives and releases any and all claims, stop notices, rights to submit stop notices, suits, demands, protests, damages, losses and expenses of any nature whatsoever (whether under statute, in equity or otherwise and whether received through assignment or otherwise) (each, individually, a "Claim") against or with respect to The Tulalip Tribes of Washington, which is referred to as the Owner in the Contract Documents, or any other party holding an interest in the Property (collectively, the "Released Parties"), or against or with respect to the Project, the Property, improvements to the Property and materials, fixtures, apparatus and machinery furnished for the Property (collectively, the "Released Properties").

Upon the receipt of the aforesaid amount, the Releasing Party expressly acknowledges that it has been paid all amounts due and owing to it for work, services, material or equipment in connection with the Work and the Releasing Party represents and warrants that all amounts due and owing to consultants, subcontractors and suppliers below the Releasing Party in connection with this Project have been paid, unless noted herewith as approved by Owner.

If any Claim is made or filed by the Releasing Party or any of its lower tier consultants, subcontractors, suppliers or laborers at any tier against or with respect to any of the Released Parties or any of the Released Properties, then the Releasing Party (1) shall immediately release and discharge, or secure the release or discharge of such Claim and (2) shall indemnify, defend and hold harmless the Released Parties from and against any and all costs, damages, expenses, court costs and attorney fees arising from such Claim or any litigation resulting from such Claim.

\_\_\_\_\_  
(the Releasing Party)

DATED: \_\_\_\_\_

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Its: \_\_\_\_\_

[Notary Seal]

State of: \_\_\_\_\_ County of: \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_

Notary Public: \_\_\_\_\_

My Commission expires: \_\_\_\_\_

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# BUYERS' RETAIL SALES TAX EXEMPTION CERTIFICATE

## Not to be used to make purchases for resale

### Type of Certificate

☐ **Single Use Certificate**

A Single use certificate must be used each time an exempt item is purchased.

☐ **Blanket Certificate**

Blanket certificates are valid for as long as the buyer and seller have a recurring business relationship. A "recurring business relationship" means at least one sales transaction within a period of twelve months. RCW 82.08.050 (7)(c).

|                |      |       |          |
|----------------|------|-------|----------|
| Vendor/Seller  |      | Date  |          |
| Street Address | City | State | Zip Code |

**I, the undersigned buyer, certify I am making an exempt purchase for the following reason: (Enter information and/or check applicable box(es))**

### 1. Nonresident:

Place of residence: \_\_\_\_\_

Type of proof of residence accepted (drivers license, fishing license, etc) \_\_\_\_\_, including any identification numbers \_\_\_\_\_, and expiration date \_\_\_\_\_.

- a. ☐ Tangible personal property other than motor vehicles for use outside Washington by a resident of a state, possession, or province of Canada, with a sales tax rate of less than three percent.
- b. ☐ Watercraft (Include make, model and serial number of vessel):

☐ Registered or documented with the US Coast Guard or state of principal use and will leave Washington waters within 45 days; **or**

☐ Buyer is a resident of a foreign country. Purchase is for use outside Washington and will leave Washington waters within 45 days.

**Seller's Signature:** \_\_\_\_\_

### 2. Electric Vehicles:

- a. ☐ Batteries for electric vehicles or the purchase of labor and services rendered in respect to installing, repairing, altering, or improving electric vehicle batteries.
- b. ☐ Tangible personal property that will become a component of electric vehicle infrastructure or the purchase of or charge made for labor and services rendered in respect to installing, constructing, repairing, or improving electric vehicle infrastructure.

### 3. Intrastate Air Transport:

- ☐ Airplanes for use in providing intrastate air transportation by a commuter air carrier and the sale of repair and related services for these airplanes.

### 4. Interstate or Foreign Commerce or Commercial Deep Sea Fishing Business:

- a. ☐ Motor vehicles, trailers and component parts thereof used to transport persons or property **for hire** in interstate or foreign commerce.
- b. ☐ Airplanes, locomotives, railroad cars or watercraft and component parts thereof used in transporting persons or property **for hire**.
- c. ☐ Labor and services rendered to construct, repair, clean, alter or improve **for hire** carrier property.
- d. ☐ Items for use connected with private or common carriers engaged in air, rail or water in interstate or foreign commerce. (**Note: Items consumed in the state are subject to use tax.**)
- e. ☐ Fuel to be consumed outside of Washington by a vessel primarily engaged in foreign commerce.  
Vessel Name: \_\_\_\_\_  
Type of Fuel: \_\_\_\_\_ Quantity: \_\_\_\_\_
- f. ☐ Watercraft, component parts, labor and services, and/or diesel fuel used in a qualifying commercial deep sea fishing operation.  
Registered Vessel Name: \_\_\_\_\_ Vessel Number: \_\_\_\_\_
- g. ☐ Purchases of liquefied natural gas (LNG) by private or common waterborne carriers in interstate or foreign commerce. The exemption applies to ninety percent of LNG transported and consumed outside this State by the buyer. (Effective July 1, 2015)

**5. Sales to Indians:**

- a. ☐ Tangible personal property (other than motor vehicles) or services purchased by Indians or Indian tribes when the goods are delivered to or services provided within Indian country. For motor vehicle sales, sellers must use the Declaration for Motor Vehicle Sales to Enrolled Tribal Members with Delivery in Indian Country form.
- b. ☐ Supplies or services purchased by prime contractors hired by Indian tribes to perform construction in Indian Country when the goods are delivered to or services provided in Indian country.

**6. Other:**

**Prescription items: You must use the Sales Tax Exemption Certificate for Health Care Providers to claim exemptions for items prescribed for human use and other medical purchases.**

- a. ☐ Machinery and equipment (*including labor and services to install*) used directly in generating electricity using solar energy in a system capable of generating not more than 10kW of electricity.
- b. ☐ Machinery and equipment (and the labor charges to install the same) used directly in producing thermal heat from collectors or solar hot water systems that produce 3 million BTU per day or less.
- c. ☐ Waste vegetable oil used to produce biodiesel fuel for personal use.
- d. ☐ Equipment rental and purchase of services for use in motion picture and video production.
- e. ☐ Objects of art or cultural value purchased by an artistic or cultural organization.
- f. ☐ Adaptive automobile equipment purchased by disabled veterans.
- g. ☐ Animal pharmaceuticals purchased by veterinarians. This exemption does not apply to pharmaceuticals for pets. (*Describe*): \_\_\_\_\_
- h. ☐ Computer hardware, peripherals, software and related installation, used by the aerospace industry.
- i. ☐ Labor, services, and tangible personal property related to the constructing of new buildings, or new parts of buildings, by a manufacturer of commercial airplanes, fuselages, or wings of a commercial airplane, or by a port district, political subdivision, or municipal corporation to be leased to such a manufacturer.
- j. ☐ Computer hardware, peripherals, software and related installation, purchased by publishers and printers.
- k. ☐ City, County, Tribal, or Inter-Tribal Housing Authorities.
- l. ☐ Tangible personal property for use in a noncontiguous state delivered to the usual receiving terminal of the shipper.

Type of Goods Purchased: \_\_\_\_\_

Point of Delivery: \_\_\_\_\_

Carrier/Agent: \_\_\_\_\_

- m. ☐ Gases and chemicals used by a manufacturer or processor for hire in the production of semiconductor materials.
- n. ☐ Hog fuel used to produce electricity, steam, heat, or biofuel.
- o. ☐ Tangible personal property under the weatherization assistance program.
- p. ☐ Trail Grooming Services.
- q. ☐ Honey bees/honey bee feed purchased by an eligible apiarist. Apiarist ID #: \_\_\_\_\_
- r. ☐ Federal credit union purchases.
- s. ☐ Wax, ceramic materials, and labor used to create molds consumed during the process of creating investment castings.
- t. ☐ Sales of ferry vessels to the state or local governmental units, components thereof, and labor and service charges.
- u. ☐ Joint Municipal Utilities Services Authority.
- v. ☐ Paratransit vehicles purchased by paratransit service providers.
- w. ☐ Large/private airplanes purchased by nonresidents.
- x. ☐ Standard financial information purchased by qualifying international investment management companies.
- y. ☐ Material and supplies directly used in the packing of fresh perishable horticultural products by persons who receive, wash, sort, and pack fresh perishable horticultural products for farmers.
- z. ☐ Vessel Deconstruction Services.

- aa. **Only** For Delivered Bottled Water ☐ 1. No Source of Potable Water ☐ 2. Prescribed Water  
☐ 3. Purchased with food stamps (SNAP)

I, the undersigned buyer, understand that by completing and signing this certificate I am certifying that I qualify for the tax-exempt purchase(s) indicated above. I understand that I will be required to pay sales or use tax on purchases that do not qualify for an exemption. In addition, I understand that false or erroneous use of this certificate will result in liability for unpaid tax with interest and may result in additional penalties.

Type of entity: ☐ Individual ☐ Corporation ☐ Sole Proprietor ☐ Partnership ☐ Other (Explain)

Type of Business: \_\_\_\_\_ Tax Registration No.: \_\_\_\_\_

Name of Buyer: \_\_\_\_\_ Title: \_\_\_\_\_

Signature of Buyer: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**Seller must maintain a copy. Do not send to Department of Revenue.**

*Each exemption on this form has specific rules (see instructions)*

### **INSTRUCTIONS**

**Buyers must ensure entitlement to the exemption before using this Certificate.** For information regarding exemptions, contact Washington State Department of Revenue Taxpayer Information Center at (360) 705-6705 or 1-800-647-7706 or visit the Department's web site at: [dor.wa.gov](http://dor.wa.gov).

**Line 1a** applies to the purchase of tangible personal property other than motor vehicles for use outside Washington by a resident of a state, possession, or province of Canada with a sales tax rate of less than three percent (e.g. Oregon, Alaska). Reference: RCW 82.08.0273, WAC 458-20-193 (6) (b) and ETA 3054.2011.

**NOTE:** Sales of motor vehicles are not covered by this certificate; please refer to RCW 82.08.0264 and WAC 458-20-177 for certificate and exemption information.

**Line 1b** applies to watercraft purchased by a nonresident for use outside Washington when delivery takes place in Washington. The buyer must provide proof of residency (picture ID) and check the applicable box. By checking the box, the buyer certifies that the vessel will leave Washington State waters within forty-five days. Sellers must examine and document the proof of residency provided by the buyer. **Seller must sign the form.** By signing the form, the seller certifies that the seller has examined and listed the buyer's proof of residency. See WAC 458-20-238 for acceptable proof of residency for corporations, partnerships and limited liability companies. Reference: RCW 82.08.0266, RCW 82.08.02665 and WAC 458-20-238.

**Line 2a** applies to the purchase of electric vehicle batteries or to labor and services rendered in respect to installing, repairing, altering, or improving electric vehicle batteries. Reference: RCW 82.08.816

**Line 2b** applies to the purchase of tangible personal property that will become a component of an electric vehicle infrastructure or to labor and services rendered in respect to installing, constructing, repairing, or improving electric vehicle infrastructure. Reference: RCW 82.08.816

**Line 3** applies to the purchase of airplanes for use in providing intrastate air transportation by a commuter air carrier and the sale of repair and related services for these airplanes. Commuter air carriers are air carriers holding authority under Title 14, part 298 of the code of federal regulations that carries passengers on at least five round trips per week on at least one route between two or more points. Reference: RCW 82.08.0262 and 82.12.0254.

**Line 4a** applies to the purchase of motor vehicles, or trailers by a business operating or contracting to operate for the holder of a carrier permit issued by the Interstate Commerce Commission. The exemption also applies to component parts and repairs of such carrier property including labor and services rendered in the course of constructing, repairing, cleaning, altering or improving the same. The buyer must attach a list stating make, model, year, serial number, motor number and ICC permit number. Reference: RCW 82.08.0263 and WAC 458-20-174.

**Line 4b** applies to the purchase of airplanes, locomotives, railroad cars, or watercraft for use in conducting interstate or foreign commerce by transporting therein or therewith persons or property **for hire**. The exemption also applies to component parts of such carrier property. Reference: RCW 82.08.0262 and WAC 458-20-175.

**Line 4c** applies to charges for labor and services rendered in the course of constructing, repairing, cleaning, altering or improving carrier property when carrier property is used *for hire*. Reference: RCW 82.08.0262 and WAC 458-20-175.

**Line 4d** applies to the purchase of durable goods or consumables, other than those mentioned in line 4b, for use in connection with interstate or foreign commerce by such businesses. The goods must be for exclusive use while engaged in transporting persons or property in interstate or foreign commerce. The exemption **does not** apply to charges for labor or services in regard to the installing, repairing, cleaning or altering of such property. Although exempt from retail sales tax, materials are subject to use tax if consumed in Washington. Unregistered businesses must attach a list stating the description and quantity of items that will be consumed in Washington and pay use tax to the seller. Reference: RCW 82.08.0261 and WAC 458-20-175.

**Line 4e** applies to fuel consumed outside the territorial waters of the United States by vessels used primarily in foreign commerce. Buyers must list the vessel name, type of fuel and quantity. Reference: RCW 82.08.0261 and WAC 458-20-175.

**Line 4f** applies to the purchase of vessels, component parts, or repairs by persons engaged in commercial deep sea fishing operations outside the territorial waters of the state of Washington. The exemption also applies to the purchase of diesel fuel used in commercial deep or commercial passenger fishing operations when annual gross receipts from the operations are at least five thousand dollars. Reference: RCW 82.08.0262, RCW 82.08.0298, and WAC 458-20-176.

**Line 4g** applies to the purchase of LNG by carriers that are registered with the Department of Revenue. Carriers not registered with the Department must pay sales tax on all LNG at the time of purchase, and may later apply for a partial refund directly from the Department.

**Line 5a** applies to the purchase of tangible personal property (other than motor vehicles) or services by an Indian or Indian tribe. The goods or services must be delivered to, or performed on the reservation. The purchaser must present a tribal membership card, a treaty fishing card, a certificate of enrollment, or a letter from a tribal official. Sellers must document the buyer's name, dollar amount of purchase, tribal affiliation and reservation where delivery is made. For motor vehicle sales, sellers must use the *Declaration for Motor Vehicle Sales to Enrolled Tribal Members with Delivery in Indian Country* form. Reference: RCW 82.08.0254 and WAC 458-20-192.

**Line 5b** applies to the purchase of consumable supplies, equipment rentals or services by a prime contractor hired by an Indian tribe to perform construction in Indian Country where the goods or services are delivered to, or performed on the reservation. The purchaser must present a construction contract with the tribe or a letter from a tribal official evidencing that they are working directly with the Tribe. Sellers must document the buyer's name, dollar amount of purchase, and reservation where delivery is made. Reference: RCW 82.08.0254 and WAC 458-20-192.

**Line 6a** applies to the purchase of qualifying machinery and equipment (and charges for labor to install) used directly in generating electricity using the sun. The solar energy system must be no larger than 10kW. Effective July 1, 2009 – June 30, 2018. Reference: RCW 82.08.963

**Line 6b** applies to the purchase of qualifying machinery and equipment (and charges for labor to install) used directly in producing thermal heat using solar collectors or solar hot water systems that produce 3 million BTU per day or less. Effective July 1, 2013 - June 30, 2018. Reference: RCW 82.08.963.

**Line 6c** applies to the purchase of waste vegetable oil from restaurants and food processors to produce biodiesel fuel for personal use. The exemption does not apply to persons that are engaged in selling biodiesel fuel at wholesale or retail. Reference: RCW 82.08.0205.

**Line 6d** applies to the rental of production equipment and purchases of production services by motion picture and video production companies. Reference: RCW 82.08.0315 and Motion Picture-Video Production Special Notice.

**Line 6e** applies to the purchase of objects of art or cultural value, and items used in the creation of a work of art (other than tools), or in displaying art objects or presenting artistic or cultural exhibitions or performances by artistic or cultural organizations. Reference: RCW 82.08.031 and WAC 458-20-249.

**Line 6f** applies to the purchases of add-on adaptive automotive equipment purchased by disabled veterans and disabled members of the armed forces currently on active duty. To qualify the equipment must be prescribed by a physician and the purchaser must be reimbursed by the Department of Veterans Affairs and the reimbursement must be paid directly to the seller. Reference: RCW 82.08.875

**Line 6g** applies to the purchase of animal pharmaceuticals by veterinarians or farmers for the purpose of administering to an animal raised for sale by a farmer. Animal pharmaceuticals must be approved by the United States Food and Drug Administration or the United States Department of Agriculture. This exemption does not extend to or include pet animals. Reference: RCW 82.08.880.

**Line 6h** applies to the purchase of computer hardware, peripherals, and software, and related installation, not otherwise eligible for the M&E exemption, used primarily in development, design, and engineering of aerospace products or in providing aerospace services. Reference: RCW 82.08.975.

**Line 6i** applies to charges for labor and services rendered in respect to the constructing of new buildings, or new parts of buildings, used primarily to manufacture commercial airplanes, fuselages of commercial airplanes, or wings of commercial airplanes. The exemption is available to manufacturers engaged in manufacturing commercial airplanes, fuselages of commercial airplanes, or wings of commercial airplanes. It is also available to port districts, political subdivisions, or municipal corporations who lease an eligible facility to a manufacturer engaged in eligible manufacturing activities. The exemption also applies to sales of tangible personal property that will become a component of such buildings during the course of the constructing, and to labor and services rendered in respect to installing, during the course of constructing, building fixtures not otherwise eligible for the exemption under RCW 82.08.02565(2)(b). Reference: RCW 82.08.980 and RCW 82.32.850.

**Line 6j** applies to the purchase of computer hardware, peripherals, digital cameras, software, and related installation not otherwise eligible for the M&E exemption that is used primarily in the printing or publishing of printed materials. The exemption includes repairs and replacement parts. Reference: RCW 82.08.806.

**Line 6k** applies to all retail purchases of goods and services by City, County, Tribal, or Inter-Tribal Housing Authorities. Reference: RCW 35.82.210.

**Line 6l** applies to the purchase of goods for use in a state, territory or possession of the United States which is not contiguous to any other state such as Alaska, Hawaii, Guam, and American Samoa. For the exemption to apply, the seller must deliver the goods to the usual receiving terminal of the for-hire carrier selected to transport the goods. Reference: RCW 82.08.0269.

**Line 6m** applies to the purchase of gases and chemicals by a manufacturer or processor for hire in the production of semiconductor materials. Limited to gases and chemicals used to grow the product, deposit or grow permanent or sacrificial layers on the product, to etch or remove material from the product, to anneal the product, to immerse the product, to clean the product, and other uses where the gases and chemicals come into direct contact with the product during the production process, or gases and chemicals used to clean the chambers and other like equipment in which processing takes place. Reference: RCW 82.08.9651.

**Line 6n** applies to the purchase of hog fuel to produce electricity, steam, heat, or biofuel. Hog fuel is defined as wood waste and other wood residuals including forest derived biomass. Hog fuel does not include firewood or wood pellets. Reference: RCW 82.08.956.

**Line 6o** applies to the purchase of tangible personal property used in the weatherization of residences under the weatherization assistance program. The tangible personal property must become a component part of the residence. Reference: RCW 82.08.998.

**Line 6p** applies to the purchase of trail grooming services by the state of Washington and nonprofit corporations organized under chapter 24.03 RCW. Trail grooming activities include snow compacting, snow redistribution, or snow removal on state or privately-owned trails. Reference: RCW 82.08.0203.

**Line 6q** applies to all honey bees and honey bee feed (e.g. sugar) purchased by an eligible apiarist. An eligible apiarist is a person who: owns or keeps one or more bee colonies; grows, raises, or produces honey bee products for sale at wholesale; and registers their hives/colonies with the WA State Department of Agriculture as required by RCW 15.60.021 References: RCW 82.08.0204 and RCW 82.08.200

**Line 6r** applies to the purchase of goods and retail services by federally chartered credit unions. Federal credit unions are exempt from state and local consumer taxes under federal law, such as sales tax, lodging taxes and rental car tax. To be exempt, the federal credit union must pay for goods and services directly, such as by a check written on the federal credit union or a credit card issued to the federal credit union. Sellers should keep a copy of the check or credit card used for payment to substantiate the exempt nature of the sale. Reference: WAC 458-20-190

**Line 6s** applies to the purchase of wax and ceramic materials used to create molds consumed during the process of creating ferrous and nonferrous investment castings used in industrial applications. Also applies to labor or services used to create wax patterns and ceramic shells used as molds in this process. Reference: RCW 82.08.983

**Line 6t** applies to sales of ferry vessels to the state of Washington or to a local governmental unit in the state of Washington for use in transporting pedestrians, vehicles, and goods within or outside the territorial waters of the state. The exemption also applies to sales of tangible personal property which becomes a component part of such ferry vessels and sales of or charges made for labor and services rendered in respect to constructing or improving such ferry vessels. Reference RCW 82.08.0285.

**Line 6u** applies to cities, counties, and other municipalities that create a Joint Municipal Services Authority. Reference: RCW 82.08.999

**Line 6v** applies to purchases of small buses, cutaways, and modified vans not more than 28 feet long by a public social service agency (transit authority) or a private, nonprofit transportation provider. Reference: RCW 82.08.0287.

**Line 6w** applies to purchases of private airplanes by nonresidents weighing over 41,000 pounds. It also provides an exemption for charges for repairing, cleaning, altering or improving such airplanes owned by nonresidents. A nonresident qualifies for these exemptions when they are not required to register the airplane with the Department of Transportation. Reference: RCW 82.08.215

**Line 6x** applies to the purchase and use of standard financial information by a qualifying international investment management company. The bill provides definitions for both “standard financial information” and “qualifying international investment management company” and limits the amount of qualifying purchases to \$15 million dollars in a calendar year. The standard financial information may be provided in a tangible format (e.g. paper documents), on a tangible media (e.g. DVD, USB drive, etc.) or as a digital product transferred electronically. Reference: RCW 82.08.207

**Line 6y** applies to purchases of materials and supplies used in packing horticultural products. The exemption applies only to persons who receive, wash, sort, and pack fresh perishable horticultural products for farmers as defined in RCW 82.04.330 and that are entitled to a deduction under RCW 82.04.4287 either as an agent or an independent contractor. Reference: RCW 82.08.0311

**Line 6z** applies to deconstruction of vessels. "Vessel deconstruction" means permanently dismantling a vessel, including: Abatement and removal of hazardous materials; the removal of mechanical, hydraulic, or electronic components or other vessel machinery and equipment; and either the cutting apart or disposal, or both, of vessel infrastructure. For the purposes of this subsection, "hazardous materials" includes fuel, lead, asbestos, polychlorinated biphenyls, and oils. "Vessel deconstruction" does not include vessel modification or repair. In order to qualify for this exemption the vessel deconstruction must be performed at either a qualified vessel deconstruction facility; or an area over water that has been permitted under section 402 of the clean water act of 1972 (33 U.S.C. Sec. 1342) for vessel deconstruction. Reference RCW 82.08.9996

**Line 6aa** this sales tax exemption only applies to bottled water delivered to the buyer in a re-usable container not sold with the water under one of the following three conditions: 1. **No Source of Potable Water** – Retail sales and use taxes do not apply to sales of bottled water for human use to persons who do not have a readily available source of potable water. Potable water is water that is safe for human consumption. 2. **Water dispensed to patients pursuant to a prescription** – Retail sales and use taxes do not apply to sales of bottled water for human use dispensed or to be dispensed to patients, pursuant to a prescription for use in the cure, mitigation, treatment, or prevention of disease or medical condition.

“Prescription” means an order, formula, or recipe issued in any form of oral, written, electronic, or other means of transmission by a duly licensed practitioner authorized by the laws of this state to prescribe.

3. Purchased under the Supplemental Nutrition Assistance Program (SNAP), formerly known as the Food Stamp Program.

For tax assistance or to request this document in an alternate format, please call 1-800-647-7706. Teletype (TTY) users may use the Washington Relay Service by calling 711.



## Amendments to the Standard Specifications



1 INTRO.AP1

## 2 INTRODUCTION

3 The following Amendments and Special Provisions shall be used in conjunction with the  
4 2016 Standard Specifications for Road, Bridge, and Municipal Construction.

### 6 AMENDMENTS TO THE STANDARD SPECIFICATIONS

8 The following Amendments to the Standard Specifications are made a part of this contract  
9 and supersede any conflicting provisions of the Standard Specifications. For informational  
10 purposes, the date following each Amendment title indicates the implementation date of the  
11 Amendment or the latest date of revision.

13 Each Amendment contains all current revisions to the applicable section of the Standard  
14 Specifications and may include references which do not apply to this particular project.

16 1-01.AP1

#### 17 Section 1-01, Definitions and Terms

18 August 1, 2016

##### 19 1-01.3 Definitions

20 The following new term and definition is inserted after the eighth paragraph:

22 **Cold Weather Protection Period** – A period of time 7 days from the day of concrete  
23 placement or the duration of the cure period, whichever is longer.

25 1-02.AP1

#### 26 Section 1-02, Bid Procedures and Conditions

27 June 1, 2017

##### 28 1-02.4(1) General

29 The first sentence of the last paragraph is revised to read:

31 Any prospective Bidder desiring an explanation or interpretation of the Bid Documents,  
32 shall request the explanation or interpretation in writing by close of business on the  
33 Thursday preceding the bid opening to allow a written reply to reach all prospective  
34 Bidders before the submission of their Bids.

##### 36 1-02.6 Preparation of Proposal

37 In this section, "Disadvantaged Business Enterprise" is revised to read "Underutilized  
38 Disadvantaged Business Enterprise", and "DBE" is revised to read "UDBE".

##### 40 1-02.9 Delivery of Proposal

41 The last sentence of the third paragraph is revised to read:

43 The Contracting Agency will not open or consider any Proposal when the Proposal or  
44 Bid deposit is received after the time specified for receipt of Proposals or received in a  
45 location other than that specified for receipt of Proposals unless an emergency or  
46 unanticipated event interrupts normal work processes of the Contracting Agency so  
47 that Proposals cannot be received.

The following new paragraph is inserted before the last paragraph:

If an emergency or unanticipated event interrupts normal work processes of the Contracting Agency so that Proposals cannot be received at the office designated for receipt of bids as specified in Section 1-02.12 the time specified for receipt of the Proposal will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which the normal work processes of the Contracting Agency resume.

#### **1-02.12 Public Opening of Proposals**

This section is supplemented with the following new paragraph:

If an emergency or unanticipated event interrupts normal work processes of the Contracting Agency so that Proposals cannot be opened at the time indicated in the call for Bids the time specified for opening of Proposals will be deemed to be extended to the same time of day on the first work day on which the normal work processes of the Contracting Agency resume.

#### **1-02.13 Irregular Proposals**

In this section, "Disadvantaged Business Enterprise" is revised to read "Underutilized Disadvantaged Business Enterprise", and "DBE" is revised to read "UDBE".

1-04.AP1

### **Section 1-04, Scope of the Work**

**June 1, 2017**

#### **1-04.2 Coordination of Contract Documents, Plans, Special Provisions, Specifications, and Addenda**

The following new paragraph is inserted before the second to last paragraph:

Whenever reference is made in these Specifications or the Special Provisions to codes, rules, specifications, and standards, the reference shall be construed to mean the code, rule, specification, or standard that is in effect on the Bid advertisement date, unless otherwise stated or as required by law.

#### **1-04.3 Reference Information**

This section is supplemented with the following new sentence:

If a document that is provided as reference information contains material also included as a part of the Contract, that portion of the document shall be considered a part of the Contract and not as Reference Information.

#### **1-04.4(2)A General**

Item number 4 in the third paragraph is revised to read:

4. Provide substitution for deleted or reduced Condition of Award Work, Apprentice Utilization and Training.

1 1-06.AP1

2 **Section 1-06, Control of Material**

3 **August 7, 2017**

4 This section is supplemented with the following new section and subsections:

5  
6 **1-06.6 Recycled Materials**

7 The Contractor shall make their best effort to utilize recycled materials in the  
8 construction of the project; the use of recycled concrete aggregate as specified in  
9 Section 1-06.6(1)A is a requirement of the Contract.

10  
11 The Contractor shall submit a Recycled Material Utilization Plan as a Type 1 Working  
12 Drawing within 30 calendar days after the Contract is executed. The plan shall provide  
13 the Contractor's anticipated usage of recycled materials for meeting the requirements  
14 of these Specifications. The quantity of recycled materials will be provided in tons and  
15 as a percentage of the Plan quantity for each material listed in Section 9-03.21(1)E  
16 Table on Maximum Allowable Percent (By Weight) of Recycled Material. When a  
17 Contract does not include Work that requires the use of a material that is included in  
18 the requirements for using materials the Contractor may state in their plan that no  
19 recycled materials are proposed for use.

20  
21 Prior to Physical Completion the Contractor shall report the quantity of recycled  
22 materials that were utilized in the construction of the project for each of the items listed  
23 in Section 9-03.21. The report shall include hot mix asphalt, recycled concrete  
24 aggregate, recycled glass, steel furnace slag and other recycled materials (e.g.  
25 utilization of on-site material and aggregates from concrete returned to the supplier).  
26 The Contractor's report shall be provided on DOT Form 350-075 Recycled Materials  
27 Reporting.

28  
29 **1-06.6(1) Recycling of Aggregate and Concrete Materials**

30 **1-06.6(1)A General**

31 The minimum quantity of recycled concrete aggregate shall be 25 percent of the  
32 total quantity of aggregate that is incorporated into the Contract for those items  
33 listed in Section 9-03.21(1)E Table on Maximum Allowable Percent (By Weight) of  
34 Recycled Material that allow the use of recycled concrete aggregate. The  
35 percentage of recycled material incorporated into the project for meeting the  
36 required percentage will be calculated in tons based on the quantity of recycled  
37 concrete used on the entire Contract and not as individual items.

38  
39 If the Contractor's total cost for Work with recycled concrete aggregate is greater  
40 than without the Contractor may choose to not use recycled concrete aggregate. If  
41 the Recycled Material Utilization Plan does not indicate the minimum usage of  
42 recycled concrete aggregate required above, or if completed project quantities do  
43 not meet the minimum usage required, the Contractor shall develop the following:

- 44  
45 1. A cost estimate for each material listed in Section 9-03.21(1)E that is  
46 utilized on the Contract. The cost estimate shall include the following:  
47  
48 a. The estimated costs for the Work for each material with 25 percent  
49 recycled concrete aggregate. The cost estimate shall include for

each material a copy of the price quote from the supplier with the lowest total cost for the Work.

- b. The estimated costs for the Work for each material without recycled concrete aggregate.

The Contractor's cost estimates shall be submitted as an attachment to the Recycled Material Utilization Plan, or with the Reporting form.

1-07.AP1

## **Section 1-07, Legal Relations and Responsibilities to the Public August 7, 2017**

### **1-07.1 Laws to be Observed**

The second paragraph is deleted.

In the second to last sentence of the third paragraph, "WSDOT" is revised to read "Contracting Agency".

### **1-07.2(2) State Sales Tax: WAC 458-20-170 – Retail Sales Tax**

The last three sentences of the first paragraph are deleted and replaced with the following new sentence:

The Contractor (Prime or Subcontractor) shall include sales or use tax on the purchase or rental of tools, machinery, equipment, or consumable supplies not integrated into the project, in the unit bid prices.

### **1-07.3(1) Forest Fire Prevention**

This section is supplemented with the following new subsections:

#### **1-07.3(1)A Fire Prevention Control and Countermeasures Plan**

The Contractor shall prepare and implement a project-specific fire prevention, control, and countermeasures plan (FPCC Plan) for the duration of the project. The Contractor shall submit a Type 2 Working Drawing no later than the date of the preconstruction conference.

#### **1-07.3(1)A1 FPCC Plan Implementation Requirements**

The Contractor's FPCC Plan shall be fully implemented at all times. The Contractor shall update the FPCC Plan throughout project construction so that the plan reflects actual site conditions and practices. The Contractor shall update the FPCC Plan at least annually and maintain a copy of the updated FPCC Plan that is available for inspection on the project site. Revisions to the FPCC Plan and the Industrial Fire Precaution Level (IFPL) shall be discussed at the weekly project safety meetings.

#### **1-07.3(1)A2 FPCC Plan Element Requirements**

The FPCC Plan shall include the following:

1. The names, titles, and contact information for the personnel responsible for implementing and updating the plan.

2. The names and telephone numbers of the Federal, State, and local agencies the Contractor shall notify in the event of a fire.
3. All potential fire causing activities such as welding, cutting of metal, blasting, fueling operations, etc.
4. The location of fire extinguishers, water, shovels, and other firefighting equipment.
5. The response procedures the Contractor shall follow in the event of a fire.

Most of Washington State is covered under the IFPL system which, by law, is managed by the Department of Natural Resources (DNR). It is the Contractor's responsibility to be familiar with the DNR requirements and to verify whether or not IFPL applies to the specific project.

If the Contractor wishes to continue a work activity that is prohibited under an industrial fire precaution level, the Contractor shall obtain a waiver from the DNR and provide a copy to the Engineer prior to continuation of work on the project.

If the IFPL requirements prohibit the Contractor from performing Work the Contractor may be eligible for an unworkable day in accordance with Section 1-08.5.

The Contractor shall comply with the requirements of these provisions at no additional cost to the Contracting Agency.

#### **1-07.8 High-Visibility Apparel**

The last paragraph is revised to read:

High-visibility garments shall be labeled as, and in a condition compliant with the ANSI/ISEA 107 (2004 or later version) and shall be used in accordance with manufacturer recommendations.

#### **1-07.8(1) Traffic Control Personnel**

In this section, references to "ANSI/ISEA 107-2004" are revised to read "ANSI/ISEA 107".

#### **1-07.8(2) Non-Traffic Control Personnel**

In this section, the reference to "ANSI/ISEA 107-2004" is revised to read "ANSI/ISEA 107".

#### **1-07.9(2) Posting Notices**

Items 1 and 2 are revised to read:

1. EEOC - P/E-1 (revised 11/09, supplemented 09/15) – **Equal Employment Opportunity IS THE LAW** published by US Department of Labor. Post for projects with federal-aid funding.
2. FHWA 1022 (revised 05/15) – **NOTICE Federal-Aid Project** published by Federal Highway Administration (FHWA). Post for projects with federal-aid funding.

Items 5, 6 and 7 are revised to read:

5. WHD 1420 (revised 02/13) – **Employee Rights and Responsibilities Under The Family And Medical Leave Act** published by US Department of Labor. Post on all projects.
6. WHD 1462 (revised 01/16) – **Employee Polygraph Protection Act** published by US Department of Labor. Post on all projects.
7. F416-081-909 (revised 09/15) – **Job Safety and Health Law** published by Washington State Department of Labor and Industries. Post on all projects.

Items 9 and 10 are revised to read:

9. F700-074-909 (revised 06/13) – **Your Rights as a Worker in Washington State** by Washington State Department of Labor and Industries (L&I). Post on all projects.
10. EMS 9874 (revised 10/15) – **Unemployment Benefits** published by Washington State Employment Security Department. Post on all projects.

#### **1-07.15(1) Spill Prevention, Control, and Countermeasures Plan**

The second sentence of the first paragraph is deleted.

The first sentence of the second paragraph is revised to read:

The SPCC Plan shall address all fuels, petroleum products, hazardous materials, and other materials defined in Chapter 447 of the WSDOT Environmental Manual M 31-11.

Item number four of the fourth paragraph (up until the colon) is revised to read:

4. **Potential Spill Sources** – Describe each of the following for all potentially hazardous materials brought or generated on-site, including but not limited to materials used for equipment operation, refueling, maintenance, or cleaning:

The first sentence of item 7e of the fourth paragraph is revised to read:

BMP methods and locations where they are used to prevent discharges to ground or water during mixing and transfer of hazardous materials and fuel.

The last paragraph is deleted.

1-08.AP1

### **Section 1-08, Prosecution and Progress June 1, 2017**

#### **1-08.1 Subcontracting**

The eighth and ninth paragraphs are revised to read:

On all projects, the Contractor shall certify to the actual amounts paid to all firms that were used as Subcontractors, lower tier subcontractors, manufacturers, regular dealers, or service providers on the Contract. This includes all Disadvantaged, Minority,

Small, Veteran or Women's Business Enterprise firms. This Certification shall be submitted to the Engineer on a monthly basis each month between Execution of the Contract and Physical Completion of the Contract using the application available at: <https://wsdot.diversitycompliance.com>. A monthly report shall be submitted for every month between Execution of the Contract and Physical Completion regardless of whether payments were made or work occurred.

The Contractor shall comply with the requirements of RCW 39.04.250, 39.76.011, 39.76.020, and 39.76.040, in particular regarding prompt payment to Subcontractors. Whenever the Contractor withholds payment to a Subcontractor for any reason including disputed amounts, the Contractor shall provide notice within 10 calendar days to the Subcontractor with a copy to the Contracting Agency identifying the reason for the withholding and a clear description of what the Subcontractor must do to have the withholding released. Retainage withheld by the Contractor prior to completion of the Subcontractors work is exempt from reporting as a payment withheld and is not included in the withheld amount. The Contracting Agency's copy of the notice to Subcontractor for deferred payments shall be submitted to the Engineer concurrently with notification to the Subcontractor.

#### **1-08.1(1) Prompt Payment, Subcontract Completion and Return of Retainage Withheld**

In item number 5 of the first paragraph, "WSDOT" is revised to read "Contracting Agency".

The last sentence in item number 11 of the first paragraph is revised to read:

The Contractor may also require any documentation from the Subcontractor that is required by the subcontract or by the Contract between the Contractor and Contracting Agency or by law such as affidavits of wages paid, and material acceptance certifications to the extent that they relate to the Subcontractor's Work.

Item number 12 of the first paragraph is revised to read:

12. If the Contractor fails to comply with the requirements of the Specification and the Subcontractor's retainage or retainage bond is wrongfully withheld, the Contractor will be subject to the actions described in No. 7 listed above. The Subcontractor may also seek recovery against the Contractor under applicable prompt pay statutes in addition to any other remedies provided for by the subcontract or by law.

#### **1-08.5 Time for Completion**

In item 2c of the last paragraph, "Quarterly Reports" is revised to read "Monthly Reports".

1-09.AP1

### **Section 1-09, Measurement and Payment April 4, 2016**

#### **1-09.6 Force Account**

The second sentence of item number 4 is revised to read:

A "specialized service" is a work operation that is not typically done by worker classifications as defined by the Washington State Department of Labor and Industries



and by the Davis Bacon Act, and therefore bills by invoice for work in road, bridge and municipal construction.

1-10.AP1

## **Section 1-10, Temporary Traffic Control January 3, 2017**

### **1-10.1(2) Description**

The first paragraph is revised to read:

The Contractor shall provide flaggers and all other personnel required for labor for traffic control activities that are not otherwise specified as being furnished by the Contracting Agency.

In the third paragraph, "Project Engineer" is revised to read "Engineer".

The following new paragraph is inserted after the third paragraph:

The Contractor shall keep lanes, on-ramps, and off-ramps, open to traffic at all times except when Work requires closures. Ramps shall not be closed on consecutive interchanges at the same time, unless approved by the Engineer. Lanes and ramps shall be closed for the minimum time required to complete the Work. When paving hot mix asphalt the Contractor may apply water to the pavement to shorten the time required before reopening to traffic.

### **1-10.3(2)C Lane Closure Setup/Takedown**

The following new paragraph is inserted before the last paragraph:

Channelization devices shall not be moved by traffic control personnel across an open lane of traffic. If an existing setup or staging of traffic control devices require crossing an open lane of traffic, the traffic control devices shall be taken down completely and then set up in the new configuration.

2-02.AP2

## **Section 2-02, Removal of Structures and Obstructions August 7, 2017**

### **2-02.3(2)A Bridge Removal**

This section's title is revised to read:

#### **Bridge and Structure Removal**

2-03.AP2

## **Section 2-03, Roadway Excavation and Embankment**

**August 1, 2016**

### **2-03.3(7)C Contractor-Provided Disposal Site**

The second paragraph is revised to read:

The Contractor shall acquire all permits and approvals required for the use of the disposal sites before any waste is hauled off the project. The Contractor shall submit a Type 1 Working Drawing consisting of copies of the permits and approvals for any disposal sites to be used. The cost of any such permits and approvals shall be included in the Bid prices for other Work.

The third paragraph is deleted.

2-06.AP2

## **Section 2-06, Subgrade Preparation**

**January 3, 2017**

### **2-06.3(2) Subgrade for Pavement**

The second sentence in the first paragraph is revised to read:

The Contractor shall compact the Subgrade to a depth of 6 inches to 95 percent of maximum density as determined by the compaction control tests for granular materials.

3-04.AP3

## **Section 3-04, Acceptance of Aggregate**

**January 3, 2017**

### **3-04.5 Payment**

In Table 1, the **Contingent Unit Price Per Ton** value for the item HMA Aggregate is revised to read "\$15.00".

4-04.AP4

## **Section 4-04, Ballast and Crush Surfacing**

**January 3, 2017**

### **4-04.3(5) Shaping and Compaction**

The first sentence is revised to read:

Immediately following spreading and final shaping, each layer of surfacing shall be compacted to at least 95 percent of maximum density determined by the requirements of Section 2-03.3(14)D before the next succeeding layer of surfacing or pavement is placed.

5-01.AP5

## **Section 5-01, Cement Concrete Pavement Rehabilitation**

**January 3, 2017**

In this section, "portland cement" is revised to read "cement".

1  
2 **5-01.2 Materials**

3 In the first paragraph, the following item is inserted after the item "Joint Sealants":

4  
5 Closed Cell Foam Backer Rod 9-04.2(3)A  
6

7 **5-01.3(1)A Concrete Mix Designs**

8 This section, including title, is revised to read:  
9

10 **5-01.3(1)A Mix Designs**

11 The Contractor shall use either concrete patching materials or cement concrete for the  
12 rehabilitation of cement concrete pavement. Concrete patching materials shall be used  
13 for spall repair and dowel bar retrofitting and cement concrete shall be used for  
14 concrete panel replacement.  
15

16 **5-01.3(1)A1 Concrete Patching Materials**

17 Item number 1 is revised to read:

- 18 1. **Materials** – The prepackaged concrete patching material and the aggregate  
19 extender shall conform to Section 9-20.  
20  
21

22 **5-01.3(1)A2 Portland Cement Concrete**

23 This section, including title, is revised to read:  
24

25 **5-01.3(1)A2 Cement Concrete for Panel Replacement**

26 Cement concrete for panel replacement shall meet the requirements of  
27 Sections 5-05.3(1) and 5-05.3(2) and be air entrained with a design air content of  
28 5.5 percent. Cement concrete for panel replacement may use rapid hardening  
29 hydraulic cement meeting the requirements of Section 9-01.2(2). Rapid hardening  
30 hydraulic cement will be considered a cementitious material for the purpose of  
31 calculating the water/cementitious materials ratio and the minimum cementitious  
32 materials requirement.  
33

34 **5-01.3(1)B Equipment**

35 This section's title is revised to read:  
36

37 **Equipment for Panel Replacement**  
38

39 **5-01.3(2)B Portland Cement Concrete**

40 This section's title is revised to read:  
41

42 **Cement Concrete for Panel Replacement**  
43

44 This section is supplemented with the following new subsection:  
45

46 **5-01.3(2)B1 Conformance to Mix Design**

47 Acceptance of cement concrete pavement for panel replacement shall be in  
48 accordance with Section 5-01.3(2)B. The cement, coarse, and fine aggregate weights  
49 shall be within the tolerances of the mix design in accordance with Section 5-05.3(1).  
50

**5-01.3(2)B1 Rejection of Concrete**

This section is renumbered as follows:

**5-01.3(2)B2 Rejection of Concrete**

**5-01.3(4) Replace Portland Cement Concrete Panel**

This section's title is revised to read:

**Replace Cement Concrete Panel**

**5-01.3(8) Sealing Existing Transverse and Longitudinal Joints**

This section's title is revised to read:

**Sealing Existing Longitudinal and Transverse Joint**

The first paragraph is revised to read:

The Contractor shall clean and seal existing longitudinal and transverse joints where shown in the Plans or as marked by the Engineer.

The first sentence of the second paragraph is revised to read:

Old sealant and incompressible material shall be completely removed from the joint to the depth of the new reservoir with a diamond blade saw in accordance with the detail shown in the Standard Plans.

The fifth paragraph is revised to read:

Immediately prior to sealing, the cracks shall be blown clean with dry oil-free compressed air. If shown in the Plans, a backer rod shall be placed at the base of the sawn reservoir. The joints shall be completely dry before the sealing installation may begin. Immediately following the air blowing and backer rod placement, if required, the sealant material shall be installed in conformance to manufacturer's recommendations and in accordance with Section 5-05.3(8)B.

**5-01.3(9) Portland Cement Concrete Pavement Grinding**

This section's title is revised to read:

**Cement Concrete Pavement Grinding**

**5-01.3(11) Concrete Slurry and Grinding Residue**

The last sentence of the first paragraph is revised to read:

Slurry shall not be allowed to drain into an area open to traffic, off of the paved surface, into any drainage structure, water of the state, or wetlands.

The following new sentence is inserted at the end of the second paragraph:

The Contractor shall submit copies of all disposal tickets to the Engineer within 5 calendar days.

1  
2 **5-01.4 Measurement**

3 The fourth paragraph is revised to read:

4  
5 Sealing existing longitudinal and transverse joint will be measured by the linear foot,  
6 measured along the line of the completed joint.  
7

8 **5-01.5 Payment**

9 The Bid item "Sealing Transverse and Longitudinal Joints", per linear foot and the  
10 paragraph following Bid item are revised to read:

11  
12 "Sealing Existing Longitudinal and Transverse Joint", per linear foot.  
13

14 The unit Contract price per linear foot for "Sealing Existing Longitudinal and Transverse  
15 Joint", shall be full payment for all costs to complete the Work as specified, including  
16 removing incompressible material, preparing and sealing existing transverse and  
17 longitudinal joints where existing transverse and longitudinal joints are cleaned and for  
18 all incidentals required to complete the Work as specified.  
19

20 5-02.AP5

21 **Section 5-02, Bituminous Surface Treatment**

22 **April 4, 2016**

23 **5-02.3(2) Preparation of Roadway Surface**

24 This section is supplemented with the following new subsection:

25  
26 **5-02.3(2)E Crack Sealing**

27 Where shown in the Plans, seal cracks and joints in the pavement in accordance with  
28 Section 5-04.3(4)A1 and the following:

- 29  
30 1. Cracks ¼ inch to 1 inch in width - fill with hot poured sealant.  
31  
32 2. Cracks greater than 1 inch in width – fill with sand slurry.  
33

34 5-04.AP5

35 **Section 5-04, Hot Mix Asphalt**

36 **April 3, 2017**

37 This section (and all subsections) is revised to read:

38  
39 This Section 5-04 is written in a style which, unless otherwise indicated, shall be  
40 interpreted as direction to the Contractor.  
41

42 **5-04.1 Description**

43 This Work consists of providing and placing one or more layers of plant-mixed hot mix  
44 asphalt (HMA) on a prepared foundation or base, in accordance with these  
45 Specifications and the lines, grades, thicknesses, and typical cross-sections shown  
46 in the Plans. The manufacture of HMA may include warm mix asphalt (WMA)  
47 processes in accordance with these Specifications.  
48

HMA shall be composed of asphalt binder and mineral materials as required, and may include reclaimed asphalt pavement (RAP) or reclaimed asphalt shingles (RAS), mixed in the proportions specified to provide a homogeneous, stable, and workable mix.

#### **5-04.2 Materials**

Provide materials as specified in these sections:

|                                  |            |
|----------------------------------|------------|
| Asphalt Binder                   | 9-02.1(4)  |
| Cationic Emulsified Asphalt      | 9-02.1(6)  |
| Anti-Stripping Additive          | 9-02.4     |
| Warm Mix Asphalt Additive        | 9-02.5     |
| Aggregates                       | 9-03.8     |
| Reclaimed Asphalt Pavement (RAP) | 9-03.8(3)B |
| Reclaimed Asphalt Shingles (RAS) | 9-03.8(3)B |
| Mineral Filler                   | 9-03.8(5)  |
| Recycled Material                | 9-03.21    |
| Joint Sealants                   | 9-04.2     |
| Closed Cell Foam Backer Rod      | 9-04.2(3)A |

#### **5-04.2(1) How to Get an HMA Mix Design on the QPL**

Comply with each of the following:

- Develop the mix design in accordance with WSDOT SOP 732.
- Develop a mix design that complies with Sections 9-03.8(2) and 9-03.8(6).
- Develop a mix design no more than 6 months prior to submitting it for QPL evaluation.
- Submit mix designs to the WSDOT State Materials Laboratory in Tumwater, including WSDOT Form 350-042.
- Include representative samples of the materials that are to be used in the HMA production as part of the mix design submittal.
- Identify the brand, type, and percentage of anti-stripping additive in the mix design submittal.
- Include with the mix design submittal a certification from the asphalt binder supplier that the anti-stripping additive is compatible with the crude source and the formulation of asphalt binder proposed for use in the mix design.
- Do not include warm mix asphalt (WMA) additives when developing a mix design or submitting a mix design for QPL evaluation. The use of warm mix asphalt (WMA) additives is not part of the process for obtaining approval for listing a mix design on the QPL. Refer to Section 5-04.2(2)B.

The Contracting Agency's basis for approving, testing, and evaluating HMA mix designs for approval on the QPL is dependent on the contractual basis for acceptance of the HMA mixture, as shown in Table 1.

Table 1

| <b>Basis for Contracting Agency Evaluation of HMA Mix Designs for Approval on the QPL</b> |                                                                                 |                                                                                                                                                         |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contractual Basis for Acceptance of HMA Mixture (see Section 5-04.3(9))</b>            | <b>Basis for Contracting Agency Approval of Mix Design for Placement on QPL</b> | <b>Contracting Agency Materials Testing for Evaluation of the Mix Design</b>                                                                            |
| Statistical Evaluation                                                                    | WSDOT Standard Practice QC-8                                                    | The Contracting Agency will test the mix design materials for compliance with Sections 9-03.8(2) and 9-03.8(6).                                         |
| Visual Evaluation                                                                         | Review of Form 350-042 for compliance with Sections 9-03.8(2) and 9-03.8(6)     | The Contracting Agency may elect to test the mix design materials, or evaluate in accordance with WSDOT Standard Practice QC-8, at its sole discretion. |

If the Contracting Agency approves the mix design, it will be listed on the QPL for 12 consecutive months. The Contracting Agency may extend the 12 month listing provided the Contractor submits a certification letter to the Qualified Products Engineer verifying that the aggregate source and job mix formula (JMF) gradation, and asphalt binder crude source and formulation have not changed. The Contractor may submit the certification no sooner than three months prior to expiration of the initial 12 month mix design approval. Within 7 calendar days of receipt of the Contractor's certification, the Contracting Agency will update the QPL. The maximum duration for approval of a mix design and listing on the QPL will be 24 months from the date of initial approval or as approved by the Engineer.

#### **5-04.2(1)A Mix Designs Containing RAP and/or RAS**

Mix designs are classified by the RAP and/or RAS content as shown in Table 2.

Table 2

| <b>Mix Design Classification Based on RAP/RAS Content</b> |                                                                                                                                 |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>RAP/RAS Classification</b>                             | <b>RAP/RAS Content<sup>1</sup></b>                                                                                              |
| Low RAP/No RAS                                            | $0\% \leq \text{RAP}\% \leq 20\%$ and $\text{RAS}\% = 0\%$                                                                      |
| High RAP/Any RAS                                          | $20\% < \text{RAP}\% \leq \text{Maximum Allowable RAP}^2$<br>and/or<br>$0\% < \text{RAS}\% \leq \text{Maximum Allowable RAS}^2$ |

<sup>1</sup>Percentages in this table are by total weight of HMA

<sup>2</sup>See Table 4 to determine the limits on the maximum amount RAP and/or RAS.

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**5-04.2(1)A1 Low RAP/No RAS – Mix Design Submittals for Placement on QPL**

For Low RAP/No RAS mix designs, comply with the following additional requirements:

1. Develop the mix design with or without the inclusion of RAP.
2. The asphalt binder grade shall be the grade indicated in the Bid item name or as otherwise required by the Contract.
3. Submit samples of RAP if used in development of the mix design.
4. Testing RAP or RAS stockpiles is not required for obtaining approval for placing these mix designs on the QPL.

**5-04.2(1)A2 High RAP/Any RAS - Mix Design Submittals for Placement on QPL**

For High RAP/Any RAS mix designs, comply with the following additional requirements:

1. For mix designs with any RAS, test the RAS stockpile (and RAP stockpile if any RAP is in the mix design) in accordance with Table 3.
2. For High RAP mix designs with no RAS, test the RAP stockpile in accordance with Table 3.
3. For mix designs with High RAP/Any RAS, construct a single stockpile for RAP and a single stockpile for RAS and isolate (sequester) these stockpiles from further stockpiling before beginning development of the mix design. Test the RAP and RAS during stockpile construction as required by item 1 and 2 above. Use the test data in developing the mix design, and report the test data to the Contracting Agency on WSDOT Form 350-042 as part of the mix design submittal for approval on the QPL. Account for the reduction in asphalt binder contributed from RAS in accordance with AASHTO PP 78. Do not add to these stockpiles after starting the mix design process.

Table 3

| <b>Test Frequency of RAP/RAS During RAP/RAS Stockpile Construction For Approving a High RAP/Any RAS Mix Design for Placement on the QPL</b>                        |                                                                        |                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------|
| Test Frequency <sup>1</sup>                                                                                                                                        | Test for                                                               | Test Method                                      |
| <ul style="list-style-type: none"><li>• 1/1000 tons of RAP (minimum of 10 per mix design) and</li><li>• 1/100 tons of RAS (minimum of 10 per mix design)</li></ul> | Asphalt Binder Content and Sieve Analysis of Fine and Coarse Aggregate | FOP for AASHTO T 308 and FOP for WAQTC T 27/T 11 |

<sup>1</sup>“tons”, in this table, refers to tons of the reclaimed material before being incorporated into HMA.



4. Limit the amount of RAP and/or RAS used in a High RAP/Any RAS mix design by the amount of binder contributed by the RAP and/or RAS, in accordance with Table 4.

Table 4

| Maximum Amount of RAP and/or RAS in HMA Mixture        |                  |
|--------------------------------------------------------|------------------|
| Maximum Amount of Binder Contributed from:             |                  |
| RAP                                                    | RAS              |
| 40% <sup>1</sup> minus contribution of binder from RAS | 20% <sup>2</sup> |

<sup>1</sup> Calculated as the weight of asphalt binder contributed from the RAP as a percentage of the total weight of asphalt binder in the mixture.

<sup>2</sup> Calculated as the weight of asphalt binder contributed from the RAS as a percentage of the total weight of asphalt binder in the mixture.

5. Develop the mix design including RAP, RAS, recycling agent, and new binder.
6. Extract, recover, and test the asphalt residue from the RAP and RAS stockpiles to determine the percent of recycling agent and/or grade of new asphalt binder needed to meet but not exceed the performance grade (PG) of asphalt binder required by the Contract.
  - a. Perform the asphalt extraction in accordance with AASHTO T 164 or ASTM D 2172 using reagent grade solvent.
  - b. Perform the asphalt recovery in accordance with AASHTO R 59 or ASTM D 1856.
  - c. Test the recovered asphalt residue in accordance with AASHTO R 29 to determine the asphalt binder grade in accordance with Section 9-02.1(4).
  - d. After determining the recovered asphalt binder grade, determine the percent of recycling agent and/or grade of new asphalt binder in accordance with ASTM D 4887.
  - e. Test the final blend of recycling agent, binder recovered from the RAP and RAS, and new asphalt binder in accordance with AASHTO R 29. The final blended binder shall meet but not exceed the performance grade of asphalt binder required by the Contract and comply with the requirements of Section 9-02.1(4).

7. Include the following test data with the mix design submittal:
  - a. All test data from RAP and RAS stockpile construction.
  - b. All data from testing the recovered and blended asphalt binder.
8. Include representative samples of the following with the mix design submittal:
  - a. RAP and RAS.
  - b. 150 grams of recovered asphalt residue from the RAP and RAS that are to be used in the HMA production.

**5-04.2(1)B Commercial HMA - Mix Design Submittal for Placement on QPL**

For HMA used in the Bid item Commercial HMA, in addition to the requirements of 5-04.2(1) identify the following in the submittal:

1. Commercial HMA
2. Class of HMA
3. Performance grade of binder
4. Equivalent Single Axle Load (ESAL)

The Contracting Agency may elect to approve Commercial HMA mix designs without evaluation.

**5-04.2(1)C Mix Design Resubmittal for QPL Approval**

Develop a new mix design and resubmit for approval on the QPL when any of the following changes occur. When these occur, discontinue using the mix design until after it is reapproved on the QPL.

1. Change in the source of crude petroleum used in the asphalt binder.
2. Changes in the asphalt binder refining process.
3. Changes in additives or modifiers in the asphalt binder.
4. Changes in the anti-strip additive, brand, type or quantity.
5. Changes to the source of material for aggregate.
6. Changes to the job mix formula that exceed the amounts as described in item 2 of Section 9-03.8(7), unless otherwise approved by the Engineer.

- 1 7. Changes in the percentage of material from a stockpile, when such  
2 changes exceed 5% of the total aggregate weight.  
3  
4 a. For Low RAP/No RAS mix designs developed without RAP,  
5 changes to the percentage of material from a stockpile will be  
6 calculated based on the total aggregate weight not including the  
7 weight of RAP.  
8  
9 b. For Low RAP/No RAS mix designs developed with RAP,  
10 changes to the percentage of material from a stockpile will be  
11 calculated based on the total aggregate weight including the  
12 weight of RAP.  
13  
14 c. For High RAP/Any RAS mix designs, changes in the percentage  
15 of material from a stockpile will be based on total aggregate  
16 weight including the weight of RAP (and/or RAS when included  
17 in the mixture).  
18

19 Prior to making any change in the amount of RAS in an approved mix design,  
20 notify the Engineer for determination of whether a new mix design is required,  
21 and obtain the Engineer's approval prior to implementing such changes.  
22

#### 23 **5-04.2(2) Mix Design – Obtaining Project Approval**

24 Use only mix designs listed on the Qualified Products List (QPL). Submit WSDOT  
25 Form 350-041 to the Engineer to request approval to use a mix design from the  
26 QPL. Changes to the job mix formula (JMF) that have been approved on other  
27 contracts may be included. The Engineer may reject a request to use a mix design  
28 if production of HMA using that mix design on any contract is not in compliance  
29 with Section 5-04.3(11)D, E, F, and G for mixture or compaction.  
30

#### 31 **5-04.2(2)A Changes to the Job Mix Formula**

32 The approved mix design obtained from the QPL will be considered the  
33 starting job mix formula (JMF) and shall be used as the initial basis for  
34 acceptance of HMA mixture, as detailed in Section 5-04.3(9).  
35

36 During production the Contractor may request to adjust the JMF. Any  
37 adjustments to the JMF will require approval of the Engineer and shall be  
38 made in accordance with item 2 of Section 9-03.8(7). After approval by the  
39 Engineer, such adjusted JMF's shall constitute the basis for acceptance of the  
40 HMA mixture.  
41

#### 42 **5-04.2(2)B Using Warm Mix Asphalt Processes**

43 The Contractor may, at the Contractor's discretion, elect to use warm mix  
44 asphalt (WMA) processes for producing HMA. WMA processes include  
45 organic additives, chemical additives, and foaming. The use of WMA is  
46 subject to the following:  
47

- 48 • Do not use WMA processes in the production of High RAP/Any RAS  
49 mixtures.
- 50 • Before using WMA processes, obtain the Engineer's approval using  
51 WSDOT Form 350-076 to describe the proposed WMA process.

### 5-04.3 Construction Requirements

#### 5-04.3(1) Weather Limitations

Do not place HMA for wearing course on any Traveled Way beginning October 1<sup>st</sup> through March 31<sup>st</sup> of the following year, without written concurrence from the Engineer.

Do not place HMA on any wet surface, or when the average surface temperatures are less than those specified in Table 5, or when weather conditions otherwise prevent the proper handling or finishing of the HMA.

Table 5

| Minimum Surface Temperature for Paving |                |               |
|----------------------------------------|----------------|---------------|
| Compacted Thickness (Feet)             | Wearing Course | Other Courses |
| Less than 0.10                         | 55°F           | 45°F          |
| 0.10 to 0.20                           | 45°F           | 35°F          |
| More than 0.20                         | 35°F           | 35°F          |

#### 5-04.3(2) Paving Under Traffic

These requirements apply when the Roadway being paved is open to traffic.

In hot weather, the Engineer may require the application of water to the pavement to accelerate the finish rolling of the pavement and to shorten the time required before reopening to traffic.

During paving operations, maintain temporary pavement markings throughout the project. Install temporary pavement markings on the Roadway prior to opening to traffic. Temporary pavement markings shall comply with Section 8-23.

#### 5-04.3(3) Equipment

##### 5-04.3(3)A Mixing Plant

Equip mixing plants as follows.

##### 1. Use tanks for storage and preparation of asphalt binder which:

- Heat the contents by means that do not allow flame to contact the contents or the tank, such as by steam or electricity.
- Heat and hold contents at the required temperatures.
- Continuously circulate contents to provide uniform temperature and consistency during the operating period.
- Provide an asphalt binder sampling valve, in either the storage tank or the supply line to the mixer.

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2. **Provide thermometric equipment:**

- In the asphalt binder feed line near the charging valve at the mixer unit, capable of detecting temperature ranges expected in the HMA and in a location convenient and safe for access by Inspectors.
- At the discharge chute of the drier to automatically register or indicate the temperature of the heated aggregates, and situated in full view of the plant operator.

3. **When heating asphalt binder:**

- Do not exceed the maximum temperature of the asphalt binder recommended by the asphalt binder supplier.
- Avoid local variations in heating.
- Provide a continuous supply of asphalt binder to the mixer at a uniform average temperature with no individual variations exceeding 25°F.

4. **Provide a mechanical sampler for sampling mineral materials that:**

- Meets the crushing or screening requirements of Section 1-05.6.

5. **Provide HMA sampling equipment that complies with WSDOT T168.**

- Use a mechanical sampling device installed between the discharge of the silo and the truck transport, approved by the Engineer, or
- Platforms or devices to enable sampling from the truck transport without entering the truck transport for sampling HMA.

6. **Provide for setup and operation of the Contracting Agency's field testing:**

- As required in Section 3-01.2(2).

7. **Provide screens or a lump breaker:**

- When using any RAP or any RAS, to eliminate oversize RAP or RAS particles from entering the pug mill or drum mixer.

**5-04.3(3)B Hauling Equipment**

Provide HMA hauling equipment with tight, clean, smooth metal beds and a cover of canvas or other suitable material of sufficient size to protect the HMA from adverse weather. Securely attach the cover to protect the HMA

whenever the weather conditions during the work shift include, or are forecast to include, precipitation or an air temperature less than 45°F.

Prevent HMA from adhering to the hauling equipment. Spray metal beds with an environmentally benign release agent. Drain excess release agent prior to filling hauling equipment with HMA. Do not use petroleum derivatives or other coating material that contaminate or alter the characteristics of the HMA. For hopper trucks, operate the conveyer during the process of applying the release agent.

#### **5-04.3(3)C Pavers**

Use self-contained, power-propelled pavers provided with an internally heated vibratory screed that is capable of spreading and finishing courses of HMA in lane widths required by the paving section shown in the Plans.

When requested by the Engineer, provide written certification that the paver is equipped with the most current equipment available from the manufacturer for the prevention of segregation of the coarse aggregate particles. The certification shall list the make, model, and year of the paver and any equipment that has been retrofitted to the paver.

Operate the screed in accordance with the manufacturer's recommendations and in a manner to produce a finished surface of the required evenness and texture without tearing, shoving, segregating, or gouging the mixture. Provide a copy of the manufacturer's recommendations upon request by the Contracting Agency. Extensions to the screed will be allowed provided they produce the same results, including ride, density, and surface texture as obtained by the primary screed. In the Travelled Way do not use extensions without both augers and an internally heated vibratory screed.

Equip the paver with automatic screed controls and sensors for either or both sides of the paver. The controls shall be capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing automatic signals that operate the screed to maintain the desired grade and transverse slope. Construct the sensor so it will operate from a reference line or a mat referencing device. The transverse slope controller shall be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent.

Equip the paver with automatic feeder controls, properly adjusted to maintain a uniform depth of material ahead of the screed.

Manual operation of the screed is permitted in the construction of irregularly shaped and minor areas. These areas include, but are not limited to, gore areas, road approaches, tapers and left-turn channelizations.

When specified in the Contract, provide reference lines for vertical control. Place reference lines on both outer edges of the Traveled Way of each Roadway. Horizontal control utilizing the reference line is permitted. Automatically control the grade and slope of intermediate lanes by means of reference lines or a mat referencing device and a slope control device. When

the finish of the grade prepared for paving is superior to the established tolerances and when, in the opinion of the Engineer, further improvement to the line, grade, cross-section, and smoothness can best be achieved without the use of the reference line, a mat referencing device may be substituted for the reference line. Substitution of the device will be subject to the continued approval of the Engineer. A joint matcher may be used subject to the approval of the Engineer. The reference line may be removed after completion of the first course of HMA when approved by the Engineer. Whenever the Engineer determines that any of these methods are failing to provide the necessary vertical control, the reference lines will be reinstalled by the Contractor.

Furnish and install all pins, brackets, tensioning devices, wire, and accessories necessary for satisfactory operation of the automatic control equipment.

If the paving machine in use is not providing the required finish, the Engineer may suspend Work as allowed by Section 1-08.6.

#### **5-04.3(3)D Material Transfer Device or Material Transfer Vehicle**

Use a material transfer device (MTD) or material transfer vehicle (MTV) to deliver the HMA from the hauling equipment to the paving machine for any lift in (or partially in) the top 0.30 feet of the pavement section used in traffic lanes. However, an MTD/V is not required for HMA placed in irregularly shaped and minor areas such as tapers and turn lanes, or for HMA mixture that is accepted by Visual Evaluation. At the Contractor's request the Engineer may approve paving without an MTD/V; the Engineer will determine if an equitable adjustment in cost or time is due. If a windrow elevator is used, the Engineer may limit the length of the windrow in urban areas or through intersections.

To be approved for use, an MTV:

1. Shall be a self-propelled vehicle, separate from the hauling vehicle or paver.
2. Shall not connected to the hauling vehicle or paver.
3. May accept HMA directly from the haul vehicle or pick up HMA from a windrow.
4. Shall mix the HMA after delivery by the hauling equipment and prior to placement into the paving machine.
5. Shall mix the HMA sufficiently to obtain a uniform temperature throughout the mixture.

To be approved for use, an MTD:

1. Shall be positively connected to the paver.
2. May accept HMA directly from the haul vehicle or pick up HMA from a windrow.

3. Shall mix the HMA after delivery by the hauling equipment and prior to placement into the paving machine.
4. Shall mix the HMA sufficiently to obtain a uniform temperature throughout the mixture.

#### **5-04.3(3)E Rollers**

Operate rollers in accordance with the manufacturer's recommendations. When requested by the Engineer, provide a Type 1 Working Drawing of the manufacturer's recommendation for the use of any roller planned for use on the project. Do not use rollers that crush aggregate, produce pickup or washboard, unevenly compact the surface, displace the mix, or produce other undesirable results.

#### **5-04.3(4) Preparation of Existing Paved Surfaces**

Before constructing HMA on an existing paved surface, the entire surface of the pavement shall be clean. Entirely remove all fatty asphalt patches, grease drippings, and other deleterious substances from the existing pavement to the satisfaction of the Engineer. Thoroughly clean all pavements or bituminous surfaces of dust, soil, pavement grindings, and other foreign matter. Thoroughly remove any cleaning or solvent type liquids used to clean equipment spilled on the pavement before paving proceeds. Fill all holes and small depressions with an appropriate class of HMA. Level and thoroughly compact the surface of the patched area.

Apply a uniform coat of asphalt (tack coat) to all paved surfaces on which any course of HMA is to be placed or abutted. Apply tack coat to cover the cleaned existing pavement with a thin film of residual asphalt free of streaks and bare spots. Apply a heavy application of tack coat to all joints. For Roadways open to traffic, limit the application of tack coat to surfaces that will be paved during the same working shift. Equip the spreading equipment with a thermometer to indicate the temperature of the tack coat material.

Do not operate equipment on tacked surfaces until the tack has broken and cured. Repair tack coat damaged by the Contractor's operation, prior to placement of the HMA.

Unless otherwise approved by the Engineer, use cationic emulsified asphalt CSS-1, CSS-1h, STE-1, or Performance Graded (PG) asphalt for tack coat. The CSS-1 and CSS-1h may be diluted with water at a rate not to exceed one part water to one part emulsified asphalt. Do not allow the tack coat material to exceed the maximum temperature recommended by the asphalt supplier.

When shown in the Plans, prelevel uneven or broken surfaces over which HMA is to be placed by using an asphalt paver, a motor patrol grader, or by hand raking, as approved by the Engineer.



1 **5-04.3(4)A Crack Sealing**

2 **5-04.3(4)A1 General**

3 When the Proposal includes a pay item for crack sealing, seal all cracks  
4 ¼ inch in width and greater.

5  
6 **Cleaning:** Ensure that cracks are thoroughly clean, dry and free of all  
7 loose and foreign material when filling with crack sealant material. Use a  
8 hot compressed air lance to dry and warm the pavement surfaces within  
9 the crack immediately prior to filling a crack with the sealant material. Do  
10 not overheat pavement. Do not use direct flame dryers. Routing cracks is  
11 not required.

12  
13 **Sand Slurry:** For cracks that are to be filled with sand slurry, thoroughly  
14 mix the components and pour the mixture into the cracks until full. Add  
15 additional CSS-1 cationic emulsified asphalt to the sand slurry as needed  
16 for workability to ensure the mixture will completely fill the crack. Strike  
17 off the sand slurry flush with the existing pavement surface and allow the  
18 mixture to cure. Top off cracks that were not completely filled with  
19 additional sand slurry. Do not place the HMA overlay until the slurry has  
20 fully cured.

21  
22 **Hot Poured Sealant:** For cracks that are to be filled with hot poured  
23 sealant, apply the material in accordance with these requirements and  
24 the manufacturer's recommendations. Furnish a Type 1 Working Drawing  
25 of the manufacturer's product information and recommendations to the  
26 Engineer prior to the start of work, including the manufacturer's  
27 recommended heating time and temperatures, allowable storage time  
28 and temperatures after initial heating, allowable reheating criteria, and  
29 application temperature range. Confine hot poured sealant material  
30 within the crack. Clean any overflow of sealant from the pavement  
31 surface. If, in the opinion of the Engineer, the Contractor's method of  
32 sealing the cracks with hot poured sealant results in an excessive amount  
33 of material on the pavement surface, stop and correct the operation to  
34 eliminate the excess material.

35  
36 **5-04.3(4)A2 Crack Sealing Areas Prior to Paving**

37 In areas where HMA will be placed, use sand slurry to fill the cracks.

38  
39 **5-04.3(4)A3 Crack Sealing Areas Not to be Paved**

40 In areas where HMA will not be placed, fill the cracks as follows:

- 41  
42 1. Cracks ¼ inch to 1 inch in width - fill with hot poured sealant.  
43  
44 2. Cracks greater than 1 inch in width – fill with sand slurry.

45  
46 **5-04.3(4)B Soil Residual Herbicide**

47 Where shown in the Plans, apply one application of an approved soil residual  
48 herbicide. Comply with Section 8-02.3(3)B. Complete paving within 48 hours  
49 of applying the herbicide.  
50

1 Use herbicide registered with the Washington State Department of Agriculture  
2 for use under pavement. Before use, obtain the Engineer's approval of the  
3 herbicide and the proposed rate of application. Include the following  
4 information in the request for approval of the material:  
5

- 6 1. Brand Name of the Material,
- 7
- 8 2. Manufacturer,
- 9
- 10 3. Environmental Protection Agency (EPA) Registration Number,
- 11
- 12 4. Material Safety Data Sheet, and
- 13
- 14 5. Proposed Rate of Application.
- 15

#### 16 **5-04.3(4)C Pavement Repair**

17 Excavate pavement repair areas and backfill these with HMA in accordance  
18 with the details shown in the Plans and as staked. Conduct the excavation  
19 operations in a manner that will protect the pavement that is to remain. Repair  
20 pavement not designated to be removed that is damaged as a result of the  
21 Contractor's operations to the satisfaction of the Engineer at no cost to the  
22 Contracting Agency. Excavate only within one lane at a time unless approved  
23 otherwise by the Engineer. Do not excavate more area than can be  
24 completely backfilled and compacted during the same shift.  
25

26 Unless otherwise shown in the Plans or determined by the Engineer, excavate  
27 to a depth of 1.0 feet. The Engineer will make the final determination of the  
28 excavation depth required.  
29

30 The minimum width of any pavement repair area shall be 40 inches unless  
31 shown otherwise in the Plans. Before any excavation, sawcut the perimeter of  
32 the pavement area to be removed unless the pavement in the pavement  
33 repair area is to be removed by a pavement grinder.  
34

35 Excavated materials shall be the property of the Contractor and shall be  
36 disposed of in a Contractor-provided site off the Right of Way or used in  
37 accordance with Sections 2-02.3(3) or 9-03.21.  
38

39 Apply a heavy application of tack coat to all surfaces of existing pavement in  
40 the pavement repair area, in accordance with Section 5-04.3(4).  
41

42 Place the HMA backfill in lifts not to exceed 0.35-foot compacted depth.  
43 Thoroughly compact each lift by a mechanical tamper or a roller.  
44

#### 45 **5-04.3(5) Producing/Stockpiling Aggregates, RAP, & RAS**

46 Produce aggregate in compliance with Section 3-01. Comply with  
47 Section 3-02 for preparing stockpile sites, stockpiling, and removing from  
48 stockpile each of the following: aggregates, RAP, and RAS. Provide sufficient  
49 storage space for each size of aggregate, RAP and RAS. Fine aggregate or  
50 RAP may be uniformly blended with the RAS as a method of preventing the  
51 agglomeration of RAS particles. Remove the aggregates, RAP and RAS from

stockpile(s) in a manner that ensures minimal segregation when being moved to the HMA plant for processing into the final mixture. Keep different aggregate sizes separated until they have been delivered to the HMA plant.

**5-04.3(5)A Stockpiling RAP or RAS for High RAP/Any RAS Mixes**

Do not place any RAP or RAS into a stockpile which has been sequestered for a High RAP/Any RAS mix design. Do not incorporate any RAP or RAS into a High RAP/Any RAS mixture from any source other than the stockpile which was sequestered for approval of that particular High RAP/Any RAS mix design.

RAP that is used in a Low RAP/No RAS mix is not required to come from a sequestered stockpile.

**5-04.3(6) Mixing**

The asphalt supplier shall introduce anti-stripping additive, in the amount designated on the QPL for the mix design, into the asphalt binder prior to shipment to the asphalt mixing plant.

Anti-strip is not required for temporary work that will be removed prior to Physical Completion.

Use asphalt binder of the grade, and from the supplier, in the approved mix design.

Prior to introducing reclaimed materials into the asphalt plant, remove wire, nails, and other foreign material. Discontinue use of the reclaimed material if the Engineer, in their sole discretion, determines the wire, nails, or other foreign material to be excessive.

Size RAP and RAS prior to entering the mixer to provide uniform and thoroughly mixed HMA. If there is evidence of the RAP or RAS not breaking down during the heating and mixing of the HMA, immediately suspend the use of the RAP or RAS until changes have been approved by the Engineer.

After the required amount of mineral materials, RAP, RAS, new asphalt binder and recycling agent have been introduced into the mixer, mix the HMA until complete and uniform coating of the particles and thorough distribution of the asphalt binder throughout the mineral materials, RAP and RAS is ensured.

Upon discharge from the mixer, ensure that the temperature of the HMA does not exceed the optimum mixing temperature shown on the approved Mix Design Report by more than 25°F, or as approved by the Engineer. When a WMA additive is included in the manufacture of HMA, do not heat the WMA additive (at any stage of production including in binder storage tanks) to a temperature higher than the maximum recommended by the manufacturer of the WMA additive.

A maximum water content of 2 percent in the mix, at discharge, will be allowed providing the water causes no problems with handling, stripping, or

flushing. If the water in the HMA causes any of these problems, reduce the moisture content.

During the daily operation, HMA may be temporarily held in approved storage facilities. Do not incorporate HMA into the Work that has been held for more than 24 hours after mixing. Provide an easily readable, low bin-level indicator on the storage facility that indicates the amount of material in storage. Waste the HMA in storage when the top level of HMA drops below the top of the cone of the storage facility, except as the storage facility is being emptied at the end of the working shift. Dispose of rejected or waste HMA at no expense to the Contracting Agency.

#### **5-04.3(7) Spreading and Finishing**

Do not exceed the maximum nominal compacted depth of any layer in any course, as shown in Table 6, unless approved by the Engineer:

Table 6

| Maximum Nominal Compacted Depth of Any Layer |                |                           |
|----------------------------------------------|----------------|---------------------------|
| HMA Class                                    | Wearing Course | Other than Wearing Course |
| 1 inch                                       | 0.35 feet      | 0.35 feet                 |
| $\frac{3}{4}$ and $\frac{1}{2}$ inch         | 0.30 feet      | 0.35 feet                 |
| $\frac{3}{8}$ inch                           | 0.15 feet      | 0.15 feet                 |

Use HMA pavers complying with Section 5-04.3(3) to distribute the mix. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

When more than one JMF is being utilized to produce HMA, place the material produced for each JMF with separate spreading and compacting equipment. Do not intermingle HMA produced from more than one JMF. Each strip of HMA placed during a work shift shall conform to a single JMF established for the class of HMA specified unless there is a need to make an adjustment in the JMF.

#### **5-04.3(8) Aggregate Acceptance Prior to Incorporation in HMA**

Sample aggregate for meeting the requirements of Section 3-04 prior to being incorporated into HMA. (The acceptance data generated for the Section 3-04 acceptance analysis will not be commingled with the acceptance data generated for the Section 5-04.3(9) acceptance analysis.) Aggregate acceptance samples shall be taken as described in Section 3-04. Aggregate acceptance testing will be performed by the Contracting Agency. Aggregate contributed from RAP and/or RAS will not be evaluated under Section 3-04.

For aggregate that will be used in HMA mixture which will be accepted by Statistical Evaluation, the Contracting Agency's acceptance of the aggregate will be based on:

1. Samples taken prior to mixing with asphalt binder, RAP, or RAS;
2. Testing for the materials properties of fracture, uncompacted void content, and sand equivalent;
3. Evaluation by the Contracting Agency in accordance with Section 3-04, including price adjustments as described therein.

For aggregate that will be used in HMA which will be accepted by Visual Evaluation, evaluation in accordance with items 1, 2, and 3 above is at the discretion of the Engineer.

#### **5-04.3(9) HMA Mixture Acceptance**

The Contracting Agency will evaluate HMA mixture for acceptance by one of two methods as determined from the criteria in Table 7.

Table 7

| <b>Basis of Acceptance for HMA Mixture</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                 |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                                                     | <b>Visual Evaluation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Statistical Evaluation</b>                                                                                   |
| <b>Criteria for Selecting the Evaluation Method</b> | <ul style="list-style-type: none"><li>• Commercial HMA placed at any location</li><li>• Any HMA placed in:<ul style="list-style-type: none"><li>○ sidewalks</li><li>○ road approaches</li><li>○ ditches</li><li>○ slopes</li><li>○ paths</li><li>○ trails</li><li>○ gores</li><li>○ prelevel</li><li>○ temporary pavement<sup>1</sup></li><li>○ pavement repair</li></ul></li><li>• Other nonstructural applications of HMA as approved by the Engineer</li></ul> | <ul style="list-style-type: none"><li>• All HMA mixture other than that accepted by Visual Evaluation</li></ul> |

<sup>1</sup> Temporary pavement is HMA that will be removed before Physical Completion of the Contract.

#### **5-04.3(9)A Test Sections**

This Section applies to HMA mixture accepted by Statistical Evaluation. A test section is not allowed for HMA accepted by Visual Evaluation.

The purpose of a test section is to determine whether or not the Contractor's mix design and production processes will produce HMA meeting the Contract requirements related to mixture. Construct HMA mixture test sections at the beginning of paving, using at least 600 tons and a maximum of 1,000 tons or as specified by the Engineer. Each test section shall be constructed in one continuous operation.

**5-04.3(9)A1 Test Section – When Required, When to Stop**

Use Tables 8 and 9 to determine when a test section is required, optional, or not allowed, and to determine when performing test sections may end. Each mix design will be evaluated independently for the test section requirements. If more than one test section is required, each test section shall be evaluated separately by the criteria in table 8 and 9.

Table 8

| <b>Criteria for Conducting and Evaluating HMA Mixture Test Sections</b><br>(For HMA Mixture Accepted by Statistical Evaluation) |                                                                                           |                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
|                                                                                                                                 | <b>High RAP/Any RAS</b>                                                                   | <b>Low RAP/No RAS</b>                                                                     |
| Is Mixture Test Section Optional or Mandatory?                                                                                  | Mandatory <sup>1</sup>                                                                    | At Contractor's Option                                                                    |
| Waiting period after paving the test section.                                                                                   | 4 calendar days <sup>2</sup>                                                              | 4 calendar days <sup>2</sup>                                                              |
| What Must Happen to Stop Performing Test Sections?                                                                              | Meet "Results Required to Stop Performing Test Sections" in Table 9 for High RAP/Any RAS. | Provide samples and respond to WSDOT test results required by Table 9 for Low RAP/No RAS. |

<sup>1</sup>If a mix design has produced an acceptable test section on a previous contract (paved in the same calendar year, from the same plant, using the same JMF) the test section may be waived if approved by the Engineer.

<sup>2</sup>This is to provide time needed by the Contracting Agency to complete testing and the Contractor to adjust the mixture in response to those test results. Paving may resume when this is done.

Table 9

| <b>Results Required to Stop Performing HMA Mixture Test Sections<sup>1</sup></b><br><b>(For HMA Mixture Accepted by Statistical Evaluation)</b> |                                                                                            |                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Test Property                                                                                                                                   | Type of HMA                                                                                |                                                       |
|                                                                                                                                                 | High RAP/Any RAS                                                                           | Low RAP/No RAS                                        |
| Gradation                                                                                                                                       | Minimum $PF_i$ of 0.95 based on the criteria in Section 5-04.3(9)B4 <sup>2</sup>           | None <sup>4</sup>                                     |
| Asphalt Binder                                                                                                                                  | Minimum $PF_i$ of 0.95 based on the criteria in Section 5-04.3(9)B4 <sup>2</sup>           | None <sup>4</sup>                                     |
| $V_a$                                                                                                                                           | Minimum $PF_i$ of 0.95 based on the criteria in Section 5-04.3(9)B4 <sup>2</sup>           | None <sup>4</sup>                                     |
| Hamburg Wheel Track Indirect Tensile Strength                                                                                                   | Meet requirements of Section 9-03.8(2). <sup>3</sup>                                       | These tests will not be done as part of Test Section. |
| Aggregates Sand Equivalent Uncompacted Void Content Fracture                                                                                    | Nonstatistical Evaluation in accordance with the requirements of Section 3-04 <sup>3</sup> | None <sup>3</sup>                                     |

<sup>1</sup>In addition to the requirements of this table, acceptance of the HMA mixture used in each test section is subject to the acceptance criteria and price adjustments for Statistical Evaluation (see Table 9a).

<sup>2</sup>Divide the test section lot into three sublots, approximately equal in size. Take one sample from each subplot, and test each sample for the property in the first column.

<sup>3</sup>Take one sample for each test section lot. Test the sample for the properties in the first column.

<sup>4</sup>Divide the test section lot into three sublots, approximately equal in size. Take one sample from each subplot, and test each sample for the property in the first column. There are no criteria for discontinuing test sections for these mixes; however, the contractor must comply with Section 5-04.3(11)F before resuming paving.

#### **5-04.3(9)A2 Test Section – Evaluating the HMA Mixture in a Test Section**

The Engineer will evaluate the HMA mixture in each test section for rejection, acceptance, and price adjustments based on the criteria in

Table 9a using the data generated from the testing required by Table 9. Each test section shall be considered a separate lot.

Table 9a

| Acceptance Criteria for HMA Mixture Placed in a Test Section<br>(For HMA Mixture Accepted by Statistical Evaluation) |                                                                               |                                                                               |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Test Property                                                                                                        | Type of HMA                                                                   |                                                                               |
|                                                                                                                      | High RAP/Any RAS                                                              | Low RAP/No RAS                                                                |
| Gradation<br>Asphalt Binder<br>$V_a$                                                                                 | Statistical Evaluation                                                        | Statistical Evaluation                                                        |
| Hamburg Wheel Track<br>Indirect Tensile Strength                                                                     | Pass/Fail for the requirements of Section 9-03.8(2) <sup>1</sup>              | N/A                                                                           |
| HMA Aggregate<br>Sand Equivalent<br>Uncompacted Void Content                                                         | Nonstatistical Evaluation in accordance with the requirements of Section 3-04 | Nonstatistical Evaluation in accordance with the requirements of Section 3-04 |

<sup>1</sup>Failure to meet the specifications for Hamburg and/or IDT will cause the mixture in the test section to be rejected. Refer to Section 5-04.3(11).

#### 5-04.3(9)B Mixture Acceptance – Statistical Evaluation

##### 5-04.3(9)B1 Mixture Statistical Evaluation – Lots and Sublots

HMA mixture which is accepted by Statistical Evaluation will be evaluated by the Contracting Agency dividing that HMA tonnage into mixture lots, and each mixture lot will be evaluated using stratified random sampling by the Contracting Agency sub-dividing each mixture lot into mixture sublots. All mixture in a mixture lot shall be of the same mix design. The mixture sublots will be numbered in the order in which the mixture (of a particular mix design) is paved.

Each mixture lot comprises a maximum of 15 mixture sublots, except:

- The final mixture lot of each mix design on the Contract will comprise a maximum of 25 sublots.
- A mixture lot for a test section will consist of three sublots.

Each mixture subplot shall be approximately uniform in size with the maximum mixture subplot size as specified in Table 10. The quantity of material represented by the final mixture subplot of the project, for each mix design on the project, may be increased to a maximum of two times the mixture subplot quantity calculated.



Table 10

| <b>Maximum HMA Mixture Sublot Size<br/>For HMA Accepted by Statistical Evaluation</b> |                                               |
|---------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>HMA Original Plan<br/>Quantity (tons)<sup>1</sup></b>                              | <b>Maximum Sublot Size (tons)<sup>2</sup></b> |
| < 20,000                                                                              | 1,000                                         |
| 20,000 to 30,000                                                                      | 1,500                                         |
| >30,000                                                                               | 2,000                                         |

<sup>1</sup> “Plan quantity” means the plan quantity of all HMA of the same class and binder grade which is accepted by Statistical Evaluation.

<sup>2</sup> The maximum sublot size for each combination of HMA class and binder grade shall be calculated separately.

- For a mixture lot in progress with a mixture CPF less than 0.75, a new mixture lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced. See also Section 5-04.3(11)F.
- If, before completing a mixture lot, the Contractor requests a change to the JMF which is approved by the Engineer, the mixture produced in that lot after the approved change will be evaluated on the basis of the changed JMF, and the mixture produced in that lot before the approved change will be evaluated on the basis of the unchanged JMF; however, the mixture before and after the change will be evaluated in the same lot. Acceptance of subsequent mixture lots will be evaluated on the basis of the changed JMF.

#### **5-04.3(9)B2 Mixture Statistical Evaluation – Sampling**

Comply with Section 1-06.2(1).

Samples of HMA mixture which is accepted by Statistical Evaluation will be randomly selected from within each sublot, with one sample per sublot. The Engineer will determine the random sample location using WSDOT Test Method T 716. The Contractor shall obtain the sample when ordered by the Engineer. The Contractor shall sample the HMA mixture in the presence of the Engineer and in accordance with FOP for WAQTC T 168.

#### **5-04.3(9)B3 Mixture Statistical Evaluation – Acceptance Testing**

Comply with Section 1-06.2(1).

The Contracting Agency will test the mixture sample from each sublot (including sublots in a test section) for the properties shown in Table 11.

Table 11

| Testing Required for each HMA Mixture Sublot                             |                         |              |
|--------------------------------------------------------------------------|-------------------------|--------------|
| Test                                                                     | Procedure               | Performed by |
| V <sub>a</sub>                                                           | WSDOT SOP 731           | Engineer     |
| Asphalt Binder Content                                                   | FOP for AASHTO T 308    | Engineer     |
| Gradation: Percent Passing<br>1½", 1", ¾", ½", ⅜", No. 4, No. 8, No. 200 | FOP for WAQTC T 27/T 11 | Engineer     |

The mixture samples and tests taken for the purpose of determining acceptance of the test section (as described in Section 5-04.3(9)A) shall also be used as the test results for acceptance of the mixture described in 5-04.3(9)B3, 5-04.3(9)B4, 5-04.3(9)B5, and 5-04.3(9)B6.

#### **5-04.3(9)B4 Mixture Statistical Evaluation – Pay Factors**

Comply with Section 1-06.2(2).

The Contracting Agency will determine a pay factor (PF<sub>i</sub>) for each of the properties in Table 11, for each mixture lot, using the quality level analysis in Section 1-06.2(2)D. For Gradation, a pay factor will be calculated for each of the sieve sizes listed in Table 11 which is equal to or smaller than the maximum allowable aggregate size (100 percent passing sieve) of the HMA mixture. The USL and LSL shall be calculated using the Job Mix Formula Tolerances (for Statistical Evaluation) in Section 9-03.8(7).

If a constituent is not measured in accordance with these Specifications, its individual pay factor will be considered 1.00 in calculating the Composite Pay Factor (CPF).

#### **5-04.3(9)B5 Mixture Statistical Evaluation – Composite Pay Factors (CPF)**

Comply with Section 1-06.2(2).

In accordance with Section 1-06.2(2)D4, the Contracting Agency will determine a Composite Pay Factor (CPF) for each mixture lot from the pay factors calculated in Section 5-04.3(9)B4, using the price adjustment factors in Table 12. Unless otherwise specified, the maximum CPF for HMA mixture shall be 1.05.

Table 12

| HMA Mixture Price Adjustment Factors                       |            |
|------------------------------------------------------------|------------|
| Constituent                                                | Factor "f" |
| All aggregate passing: 1½", 1", ¾", ½", ⅜" and No.4 sieves | 2          |
| All aggregate passing No. 8 sieve                          | 15         |
| All aggregate passing No. 200 sieve                        | 20         |
| Asphalt binder                                             | 40         |
| Air Voids (V <sub>a</sub> )                                | 20         |

#### 5-04.3(9)B6 Mixture Statistical Evaluation – Price Adjustments

For each HMA mixture lot, a Job Mix Compliance Price Adjustment will be determined and applied, as follows:

$$\text{JMCPA} = [0.60 \times (\text{CPF} - 1.00)] \times Q \times \text{UP}$$

Where

JMCPA = Job Mix Compliance Price Adjustment for a given lot of mixture (\$)

CPF = Composite Pay factor for a given lot of mixture (maximum is 1.05)

Q = Quantity in a given lot of mixture (tons)

UP = Unit price of the HMA in a given lot of mixture (\$/ton)

#### 5-04.3(9)B7 Mixture Statistical Evaluation – Retests

The Contractor may request that a mixture subplot be retested. To request a retest, submit a written request to the Contracting Agency within 7 calendar days after the specific test results have been posted to the website or emailed to the Contractor, whichever occurs first. The Contracting Agency will send a split of the original acceptance sample for testing by the Contracting Agency to either the Region Materials Laboratory or the State Materials Laboratory as determined by the Engineer. The Contracting Agency will not test the split of the sample with the same equipment or by the same tester that ran the original acceptance test. The sample will be tested for a complete gradation analysis, asphalt binder content, and V<sub>a</sub>, and the results of the retest will be used for the acceptance of the HMA mixture in place of the original mixture subplot sample test results. The cost of testing will be deducted from any monies due or that may come due the Contractor under the Contract at the rate of \$250 per sample.

#### 5-04.3(9)C Vacant

#### 5-04.3(9)D Mixture Acceptance – Visual Evaluation

Visual Evaluation of HMA mixture will be by visual inspection by the Engineer or, in the sole discretion of the Engineer, the Engineer may sample and test the mixture.

**5-04.3(9)D1 Mixture Visual Evaluation – Lots, Sampling, Testing, Price Adjustments**

HMA mixture accepted by Visual Evaluation will not be broken into lots unless the Engineer determines that testing is required. When that occurs, the Engineer will identify the limits of the questionable HMA mixture, and that questionable HMA mixture shall constitute a lot. Then, the Contractor will take samples from the truck, or the Engineer will take core samples from the roadway at a minimum of three random locations from within the lot, selected in accordance with WSDOT Test Method T 716, taken from the roadway in accordance with WSDOT SOP 734, and tested in accordance with WSDOT SOP 737. The Engineer will test one of the samples for all constituents in Section 5-04.3(9)B3. If all constituents from that test fall within the Job Mix Formula Tolerances (for Visual Evaluation) in Section 9-03.8(7), the lot will be accepted at the unit Contract price with no further evaluation.

When one or more constituents fall outside those tolerance limits, the other samples will be tested for all constituents in Section 5-04.3(9)B3, and a Job Mix Compliance Price Adjustment will be calculated in accordance with Table 13.

Table 13

| <b>Visual Evaluation – Out of Tolerance Procedures</b> |                     |
|--------------------------------------------------------|---------------------|
| Comply with the Following                              |                     |
| Pay Factors <sup>1</sup>                               | Section 5-04.3(9)B4 |
| Composite Pay Factors <sup>2</sup>                     | Section 5-04.3(9)B5 |
| Price Adjustments                                      | Section 5-04.3(9)B6 |

<sup>1</sup>The Visual Evaluation tolerance limits in Section 9-03.8(7) will be used in the calculation of the PF<sub>i</sub>.

<sup>2</sup>The maximum CPF shall be 1.00.

**5-04.3(9)E Mixture Acceptance – Notification of Acceptance Test Results**

The results of all mixture acceptance testing and the Composite Pay Factor (CPF) of the lot after three sublots have been tested will be available to the Contractor through The Contracting Agency's website.

The Contracting Agency will endeavor to provide written notification (via email to the Contractor's designee) of acceptance test results through its web-based materials testing system Statistical Analysis of Materials (SAM) within 24 hours of the sample being made available to the Contracting Agency. However, the Contractor agrees:

1. Quality control, defined as the system used by the Contractor to monitor, assess, and adjust its production processes to ensure that the final HMA mixture will meet the specified level of quality, is the sole responsibility of the Contractor.

2. The Contractor has no right to rely on any testing performed by the Contracting Agency, nor does the Contractor have any right to rely on timely notification by the Contracting Agency of the Contracting Agency's test results (or statistical analysis thereof), for any part of quality control and/or for making changes or correction to any aspect of the HMA mixture.
3. The Contractor shall make no claim for untimely notification by the Contracting Agency of the Contracting Agency's test results or statistical analysis.

#### **5-04.3(10) HMA Compaction Acceptance**

For all HMA, the Contractor shall comply with the General Compaction Requirements in Section 5-04.3(10)A. The Contracting Agency will evaluate all HMA for compaction compliance with one of the following - Statistical Evaluation, Visual Evaluation, or Test Point Evaluation - determined by the criteria in Table 14:

Table 14

| <b>Criteria for Determining Method of Evaluation for HMA Compaction<sup>1</sup></b>                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                      |                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Statistical Evaluation of HMA Compaction is Required For:</b>                                                                                                                                                                                                                                                                                                                                                                            | <b>Visual Evaluation of HMA Compaction is Required For:</b>                                                          | <b>Test Point Evaluation of HMA Compaction is Required For:</b>                                                                      |
| <ul style="list-style-type: none"> <li>• Any HMA for which the specified course thickness is greater than 0.10 feet, and the HMA is in:               <ul style="list-style-type: none"> <li>○ traffic lanes, including but not limited to:                   <ul style="list-style-type: none"> <li>• ramp lanes</li> <li>• truck climbing lanes</li> <li>• weaving lanes</li> <li>• speed change lanes</li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• "HMA for Preleveling..."</li> <li>• "HMA for Pavement Repair..."</li> </ul> | <ul style="list-style-type: none"> <li>• Any HMA not meeting the criteria for Statistical Evaluation or Visual Evaluation</li> </ul> |

<sup>1</sup>This table applies to all HMA, and shall be the sole basis for determining the acceptance method for compaction.

The Contracting Agency may, at its sole discretion, evaluate any HMA for compliance with the Cyclic Density requirements of Section 5-04.3(10)B.

#### **5-04.3(10)A HMA Compaction – General Compaction Requirements**

Immediately after the HMA has been spread and struck off, and after surface irregularities have been adjusted, thoroughly and uniformly compact the mix. The completed course shall be free from ridges, ruts, humps, depressions, objectionable marks, and irregularities and shall

conform to the line, grade, and cross-section shown in the Plans. If necessary, alter the JMF in accordance with Section 9-03.8(7) to achieve desired results.

Compact the mix when it is in the proper condition so that no undue displacement, cracking, or shoving occurs. Compact areas inaccessible to large compaction equipment by mechanical or hand tampers. Remove HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt, or is in any way defective. Replace the removed material with new HMA, and compact it immediately to conform to the surrounding area.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided the specified densities are attained. An exception shall be that pneumatic tired rollers shall be used for compaction of the wearing course beginning October 1<sup>st</sup> of any year through March 31<sup>st</sup> of the following year. Coverage with a steel wheel roller may precede pneumatic tired rolling. Unless otherwise approved by the Engineer, operate rollers in the static mode when the internal temperature of the mix is less than 175°F. Regardless of mix temperature, do not operate a roller in a mode that results in checking or cracking of the mat.

On bridge decks and on the five feet of roadway approach immediately adjacent to the end of bridge/back of pavement seat, operate rollers in static mode only.

#### **5-04.3(10)B HMA Compaction – Cyclic Density**

Low cyclic density areas are defined as spots or streaks in the pavement that are less than 90 percent of the theoretical maximum density. At the Engineer's discretion, the Engineer may evaluate the HMA pavement for low cyclic density, and when doing so will follow WSDOT SOP 733. A \$500 Cyclic Density Price Adjustment will be assessed for any 500-foot section with two or more density readings below 90 percent of the theoretical maximum density.

#### **5-04.3(10)C HMA Compaction Acceptance – Statistical Evaluation**

HMA compaction which is accepted by Statistical Evaluation will be based on acceptance testing performed by the Contracting Agency, and statistical analysis of those acceptance tests results. This will result in a Compaction Price Adjustment.

##### **5-04.3(10)C1 HMA Compaction Statistical Evaluation – Lots and Sublots**

HMA compaction which is accepted by Statistical Evaluation will be evaluated by the Contracting Agency dividing the project into compaction lots, and each compaction lot will be evaluated using stratified random sampling by the Contracting Agency sub-dividing each compaction lot into compaction sublots. All mixture in any individual compaction lot shall be of the same mix design. The

compaction sublots will be numbered in the order in which the mixture (of a particular mix design) is paved.

Each compaction lot comprises a maximum of 15 compaction sublots, except for the final compaction lot of each mix design on the Contract, which comprises a maximum of 25 sublots.

Each compaction subplot shall be uniform in size as shown in Table 15, except that the last compaction subplot of each day may be increased to a maximum of two times the compaction subplot quantity calculated. Minor variations in the size of any subplot shall not be cause to invalidate the associated test result.

Table 15

| <b>HMA Compaction Sublot Size</b>              |                               |
|------------------------------------------------|-------------------------------|
| HMA Original Plan Quantity (tons) <sup>1</sup> | Compaction Sublot Size (tons) |
| <20,000                                        | 100                           |
| 20,000 to 30,000                               | 150                           |
| >30,000                                        | 200                           |

<sup>1</sup> In determining the plan quantity tonnage, do not include any tons accepted by test point evaluation.

The following will cause one compaction lot to end prematurely and a new compaction lot to begin:

- For a compaction lot in progress with a compaction CPF less than 0.75, a new compaction lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced. See also Section 5-04.3(11)F.

All HMA which is paved on a bridge and accepted for compaction by Statistical Evaluation will compose a bridge compaction lot. If the contract includes such HMA on more than one bridge, compaction will be evaluated on each bridge individually, as separate bridge compaction lots.

Bridge compaction sublots will be determined by the Engineer subject to the following:

- All sublots on a given bridge will be approximately the same size.
- Sublots will be stratified from the lot.
- In no case will there be less than 3 sublots in each bridge compaction lot.

- No subplot will exceed 50 tons.
- Compaction test locations will be determined by the Engineer in accordance with WSDOT FOP for AASHTO T716.

#### 5-04.3(10)C2 HMA Compaction Statistical Evaluation – Acceptance Testing

Comply with Section 1-06.2(1).

The location of HMA compaction acceptance tests will be randomly selected by the Contracting Agency from within each subplot, with one test per subplot. The Contracting Agency will determine the random sample location using WSDOT Test Method T 716.

Use Table 16 to determine compaction acceptance test procedures and to allocate compaction acceptance sampling and testing responsibilities between the Contractor and the Contracting Agency. HMA cores shall be taken or nuclear density testing shall occur after completion of the finish rolling, prior to opening to traffic, and on the same day that the mix is placed.

Table 16

| <b>HMA Compaction Acceptance Testing Procedures and Responsibilities</b> |                                                                                                                                                              |                                                                                                                                                        |                                                      |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
|                                                                          | When Contract Includes Bid Item “HMA Core – Roadway” or “HMA Core – Bridge” <sup>4</sup>                                                                     | When Contract Does Not Include Bid Item “HMA Core – Roadway” or “HMA Core – Bridge” <sup>4</sup>                                                       |                                                      |
| Basis for Test:                                                          | Cores                                                                                                                                                        | Cores <sup>3</sup>                                                                                                                                     | Nuclear Density Gauge <sup>3</sup>                   |
| In-Place Density Determined by:                                          | Contractor shall take cores <sup>1</sup> using WSDOT SOP 734 <sup>2</sup><br><hr/> Contracting Agency will determine core density using FOP for AASHTO T 166 | Contracting Agency will take cores <sup>1</sup> using WSDOT SOP 734<br><hr/> Contracting Agency will determine core density using FOP for AASHTO T 166 | Contracting Agency, using WSDOT FOP for AASHTO T 355 |
| Theoretical Maximum Density Determined by:                               | Contracting Agency, using FOP for AASHTO T 209                                                                                                               |                                                                                                                                                        |                                                      |



Table 16

| <b>HMA Compaction Acceptance Testing Procedures and Responsibilities</b> |                                         |                                         |                                                      |
|--------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------------------|
| Rolling Average of Theoretical Maximum Densities Determined by:          | Contracting Agency, using WSDOT SOP 729 |                                         |                                                      |
| Percent Compaction in Each Sublot Determined by:                         | Contracting Agency, using WSDOT SOP 736 | Contracting Agency, using WSDOT SOP 736 | Contracting Agency, using WSDOT FOP for AASHTO T 355 |

<sup>1</sup>The core diameter shall be 4-inches unless otherwise approved by the Engineer.

<sup>2</sup>The Contractor shall take the core samples in the presence of the Engineer, at locations designated by the Engineer, and deliver the core samples to the Contracting Agency.

<sup>3</sup>The Contracting Agency will determine, in its sole discretion, whether it will take cores or use the nuclear density gauge to determine in-place density. Exclusive reliance on cores for density acceptance is generally intended for small paving projects and is not intended as a replacement for nuclear gauge density testing on typical projects.

<sup>4</sup>The basis for test of all compaction sublots in a bridge compaction lot shall be cores. These cores shall be taken by the Contractor when the Proposal includes the bid item "HMA Cores – Bridge". When there is no bid item for "HMA Cores – Bridge", the Engineer will be responsible for taking HMA cores for all compaction sublots in a bridge compaction lot. In either case, the Engineer will determine core location, in-place density of the core, theoretical maximum density, rolling average of theoretical maximum density, and percent compaction using the procedure called for in this Section.

When using the nuclear density gauge for acceptance testing of pavement density, the Engineer will follow WSDOT SOP 730 for correlating the nuclear gauge with HMA cores. When cores are required for the correlation, coring and testing will be by the Contracting Agency. When a core is taken for gauge correlation at the location of a sublot, the relative density of the core will be used for the sublot test result and is exempt from retesting.

#### **5-04.3(10)C3 HMA Statistical Compaction – Price Adjustments**

For each HMA compaction lot (that is accepted by Statistical Evaluation) which has less than three compaction sublots, for which all compaction sublots attain a minimum of 91 percent compaction determined in accordance with WSDOT FOP for AASHTO T 355 (or WSDOT SOP 736 when provided by the Contract), the HMA will be accepted at the unit Contract price with no further evaluation.

For each HMA compaction lot (that is accepted by Statistical Evaluation) which does not meet the criteria in the preceding paragraph, the compaction lot shall be evaluated in accordance with Section 1-06.2(2) to determine the appropriate Compaction Price Adjustment (CPA). All of the test results obtained from the acceptance samples from a given compaction lot shall be evaluated collectively. Additional testing by either a nuclear density gauge or cores will be completed as required to provide a minimum of three tests for evaluation.

For the statistical analysis in Section 1-06.2, use the following values:

x = Percent compaction of each subplot  
USL = 100  
LSL = 91

Each CPA will be determined as follows:

$$CPA = [0.40 \times (CPF - 1.00)] \times Q \times UP$$

Where

CPA = Compaction Price Adjustment for the compaction lot (\$)  
CPF = Composite Pay Factor for the compaction lot (maximum is 1.05)  
Q = Quantity in the compaction lot (tons)  
UP = Unit price of the HMA in the compaction lot (\$/ton)

#### **5-04.3(10)C4 HMA Statistical Compaction – Requests for Retesting**

For a compaction subplot that has been tested with a nuclear density gauge that did not meet the minimum of 91 percent of the theoretical maximum density in a compaction lot with a CPF below 1.00 and thus subject to a price reduction or rejection, the Contractor may request that a core, taken at the same location as the nuclear density test, be used for determination of the relative density of the compaction subplot. The relative density of the core will replace the relative density determined by the nuclear density gauge for the compaction subplot and will be used for calculation of the CPF and acceptance of HMA compaction lot. When cores are taken by the Contracting Agency at the request of the Contractor, they shall be requested by noon of the next workday after the test results for the compaction subplot have been provided or made available to the Contractor. Traffic control shall be provided by the Contractor as requested by the Engineer. Failure by the Contractor to provide the requested traffic control will result in forfeiture of the request for retesting. When the CPF for the compaction lot based on the results of the cores is less than 1.00, the Contracting Agency will deduct the cost for the coring from any monies due or that may become due the Contractor under the Contract at the rate of \$200 per core and the Contractor shall pay for the cost of the traffic control.

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**5-04.3(10)D HMA Compaction – Visual Evaluation**

Visual Evaluation will be the basis of acceptance for compaction of the Bid items “HMA for Pavement Repair Cl. \_\_\_\_ PG \_\_\_\_” and “HMA for Prelevelling Class \_\_\_\_ PG \_\_\_\_”. This HMA shall be thoroughly compacted to the satisfaction of the Engineer. HMA that is used to prelevel wheel ruts shall be compacted with a pneumatic tire roller.

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**5-04.3(10)E HMA Compaction – Test Point Evaluation**

When compaction acceptance is by Test Point Evaluation, compact HMA based on a test point evaluation of the compaction train. Perform the test point evaluation in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

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**5-04.3(10)F HMA Compaction Acceptance – Notification of Acceptance Test Results**

The obligations and responsibilities for notifying the Contractor of compaction acceptance test results are the same as for mixture acceptance test results. See Section 5-04.3(9)E.

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**5-04.3(11) Reject Work**

This Section applies to HMA and all requirements related to HMA (except aggregates prior to being incorporated into HMA). For rejection of aggregate prior to its incorporation into HMA refer to Section 3-04.

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**5-04.3(11)A Reject Work – General**

Work that is defective or does not conform to Contract requirements shall be rejected. The Contractor may propose, in writing, alternatives to removal and replacement of rejected material. Acceptability of such alternative proposals will be determined at the sole discretion of the Engineer.

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**5-04.3(11)B Rejection by Contractor**

The Contractor may, prior to acceptance sampling and testing, elect to remove any defective material and replace it with new material. Any such new material will be sampled, tested, and evaluated for acceptance.

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**5-04.3(11)C Rejection Without Testing (Mixture or Compaction)**

The Engineer may, without sampling, reject any batch, load, or section of Roadway that appears defective. Material rejected before placement shall not be incorporated into the pavement.

No payment will be made for the rejected materials or the removal of the materials unless the Contractor requests the rejected material to be tested. If the Contractor requests testing, acceptance will be by Statistical Evaluation, and a minimum of three samples will be obtained and tested. When uncompacted material is required for testing but not available, the Engineer will determine random sample locations on the roadway in accordance with WSDOT Test Method T 716, take cores in accordance with WSDOT SOP 734, and test the cores in accordance with WSDOT SOP 737.

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1 If the CPF for the rejected material is less than 0.75, no payment will be  
2 made for the rejected material; in addition, the cost of sampling and  
3 testing shall be borne by the Contractor. If the CPF is greater than or  
4 equal to 0.75, the cost of sampling and testing will be borne by the  
5 Contracting Agency. If the material is rejected before placement and the  
6 CPF is greater than or equal to 0.75, compensation for the rejected  
7 material will be at a CPF of 0.75. If rejection occurs after placement and  
8 the CPF is greater than or equal to 0.75, compensation for the rejected  
9 material will be at the calculated CPF with an addition of 25 percent of the  
10 unit Contract price added for the cost of removal and disposal.

11  
12 **5-04.3(11)D Rejection – A Partial Sublot (Mixture or Compaction)**

13 In addition to the random acceptance sampling and testing, the Engineer  
14 may also isolate from a mixture or compaction sublot any material that is  
15 suspected of being defective in relative density, gradation or asphalt  
16 binder content. Such isolated material will not include an original sample  
17 location. The Contracting Agency will obtain a minimum of three random  
18 samples of the suspect material and perform the testing. When  
19 uncompacted material is required for testing but is not available, the  
20 Engineer will select random sample locations on the roadway in  
21 accordance with WSDOT Test Method T 716, take cores samples in  
22 accordance with WSDOT SOP 734, and test the material in accordance  
23 with WSDOT SOP 737. The material will then be statistically evaluated as  
24 an independent lot in accordance with Section 1-06.2(2).

25  
26 **5-04.3(11)E Rejection – An Entire Sublot (Mixture or Compaction)**

27 An entire mixture or compaction sublot that is suspected of being  
28 defective may be rejected. When this occurs, a minimum of two additional  
29 random samples from this sublot will be obtained. When uncompacted  
30 material is required for the additional samples but the material has been  
31 compacted, the Contracting Agency will take and test cores from the  
32 roadway as described in Section 5-04.3(11)D. The additional samples  
33 and the original sublot will be evaluated as an independent lot in  
34 accordance with Section 1-06.2(2).

35  
36 **5-04.3(11)F Rejection - A Lot in Progress (Mixture or Compaction)**

37 The Contractor shall shut down operations and shall not resume HMA  
38 placement until such time as the Engineer is satisfied that material  
39 conforming to the Specifications can be produced when:

- 40  
41 1. the Composite Pay Factor (CPF) of a mixture or compaction lot  
42 in progress drops below 1.00 and the Contractor is taking no  
43 corrective action, or  
44  
45 2. the Pay Factor (PF<sub>i</sub>) for any constituent of a mixture or  
46 compaction lot in progress drops below 0.95 and the Contractor  
47 is taking no corrective action, or  
48  
49 3. either the PF<sub>i</sub> for any constituent (or the CPF) of a mixture or  
50 compaction lot in progress is less than 0.75.

51  
52 **5-04.3(11)G Rejection – An Entire Lot (Mixture or Compaction)**

53 An entire lot with a CPF of less than 0.75 will be rejected.

1  
2 **5-04.3(12) Joints**

3 **5-04.3(12)A HMA Joints**

4 **5-04.3(12)A1 Transverse Joints**

5 Conduct operations such that placement of the top or wearing course  
6 is a continuous operation or as close to continuous as possible.

7 Unscheduled transverse joints will be allowed, but the roller may  
8 pass over the unprotected end of the freshly laid HMA only when the  
9 placement of the course is discontinued for such a length of time that  
10 the HMA will cool below compaction temperature. When the Work is  
11 resumed, cut back the previously compacted HMA to produce a  
12 slightly beveled edge for the full thickness of the course.

13  
14 Construct a temporary wedge of HMA on a 50H:1V where a  
15 transverse joint as a result of paving or planing is open to traffic.  
16 Separate the HMA in the temporary wedge from the permanent HMA  
17 upon which it is placed by strips of heavy wrapping paper or other  
18 methods approved by the Engineer. Remove the wrapping paper  
19 and trim the joint to a slightly beveled edge for the full thickness of  
20 the course prior to resumption of paving.

21  
22 Waste the material that is cut away and place new HMA against the  
23 cut. Use rollers or tamping irons to seal the joint.

24  
25 **5-04.3(12)A2 Longitudinal Joints**

26 Offset the longitudinal joint in any one course from the course  
27 immediately below by not more than 6 inches nor less than 2 inches.  
28 Locate all longitudinal joints constructed in the wearing course at a  
29 lane line or an edge line of the Traveled Way. Construct a notched  
30 wedge joint along all longitudinal joints in the wearing surface of new  
31 HMA unless otherwise approved by the Engineer. The notched  
32 wedge joint shall have a vertical edge of not less than the maximum  
33 aggregate size nor more than 1/2 of the compacted lift thickness, and  
34 then taper down on a slope not steeper than 4H:1V. Uniformly  
35 compact the sloped portion of the HMA notched wedge joint.

36  
37 On one-lane ramps a longitudinal joint may be constructed at the  
38 center of the traffic lane, subject to approval by the Engineer, if:

- 39  
40 1. The ramp must remain open to traffic, or  
41  
42 2. The ramp is closed to traffic and a hot-lap joint is  
43 constructed.  
44  
45 a. Two paving machines shall be used to construct the  
46 hot-lap joint.  
47  
48 b. The pavement within 6 inches of the hot-lap joint will  
49 not be excluded from random location selection for  
50 compaction testing.  
51  
52 c. Construction equipment other than rollers shall not  
53 operate on any uncompacted HMA.

When HMA is placed adjacent to cement concrete pavement, construct longitudinal joints between the HMA and the cement concrete pavement. Saw the joint to the dimensions shown on Standard Plan A-40.10 and fill with joint sealant meeting the requirements of Section 9-04.2.

#### **5-04.3(12)B Bridge Paving Joint Seals**

##### **5-04.3(12)B1 HMA Sawcut and Seal**

Prior to placing HMA on the bridge deck, establish sawcut alignment points at both ends of the bridge paving joint seal to be placed at the bridge ends, and at interior joints within the bridge deck when and where shown in the Plans. Establish the sawcut alignment points in a manner that they remain functional for use in aligning the sawcut after placing the HMA overlay.

Submit a Type 1 Working Drawing consisting of the sealant manufacturer's application procedure.

Construct the bridge paving joint seal as specified in the Plans and in accordance with the detail shown in the Standard Plans. Construct the sawcut in accordance with Section 5-05.3(8). Apply the sealant in accordance with Section 5-05.3(8)B and the manufacturer's application procedure.

##### **5-04.3(12)B2 Paved Panel Joint Seal**

Construct the paved panel joint seal in accordance with the requirements specified in Section 5-04.3(12)B1 and the following requirement:

1. Clean and seal the existing joint between concrete panels in accordance with Section 5-01.3(8) and the details shown in the Standard Plans.

#### **5-04.3(13) Surface Smoothness**

The completed surface of all courses shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. The completed surface of the wearing course shall not vary more than  $\frac{1}{8}$  inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline. The transverse slope of the completed surface of the wearing course shall vary not more than  $\frac{1}{4}$  inch in 10 feet from the rate of transverse slope shown in the Plans.

When deviations in excess of the above tolerances are found that result from a high place in the HMA, correct the pavement surface by one of the following methods:

1. Remove material from high places by grinding with an approved grinding machine, or
2. Remove and replace the wearing course of HMA, or
3. By other method approved by the Engineer.

Correct defects until there are no deviations anywhere greater than the allowable tolerances.

Deviations in excess of the above tolerances that result from a low place in the HMA and deviations resulting from a high place where corrective action, in the opinion of the Engineer, will not produce satisfactory results will be accepted with a price adjustment. The Engineer shall deduct from monies due or that may become due to the Contractor the sum of \$500.00 for each and every section of single traffic lane 100 feet in length in which any excessive deviations described above are found.

When portland cement concrete pavement is to be placed on HMA, the surface tolerance of the HMA shall be such that no surface elevation lies above the Plan grade minus the specified Plan depth of portland cement concrete pavement. Prior to placing the portland cement concrete pavement, bring any such irregularities to the required tolerance by grinding or other means approved by the Engineer.

When utility appurtenances such as manhole covers and valve boxes are located in the Traveled Way, pave the Roadway before the utility appurtenances are adjusted to the finished grade.

#### **5-04.3(14) Planing Bituminous Pavement**

Plane in such a manner that the underlying pavement is not torn, broken, or otherwise damaged by the planing operation. Delamination or raveling of the underlying pavement will not be construed as damage due to the Contractor's operations. Pavement outside the limits shown in the Plans or designated by the Engineer that is damaged by the Contractor's operations shall be repaired to the satisfaction of the Engineer at no additional cost to the Contracting Agency.

For mainline planing operations, use equipment with automatic controls and with sensors for either or both sides of the equipment. The controls shall be capable of sensing the grade from an outside reference line, or a mat-referencing device. The automatic controls shall have a transverse slope controller capable of maintaining the mandrel at the desired transverse slope (expressed as a percentage) within plus or minus 0.1 percent.

Remove all loose debris from the planed surface before opening the planed surface to traffic. The planings and other debris resulting from the planing operation shall become the property of the Contractor and be disposed of in accordance with Section 2-03.3(7)C, or as otherwise allowed by the Contract.

#### **5-04.3(15) Sealing Pavement Surfaces**

Apply a fog seal where shown in the Plans. Construct the fog seal in accordance with Section 5-02.3. Unless otherwise approved by the Engineer, apply the fog seal prior to opening to traffic.

#### **5-04.3(16) HMA Road Approaches**

Construct HMA approaches at the locations shown in the Plans or where staked by the Engineer, in accordance with Section 5-04.

#### 5-04.4 Measurement

HMA Cl. \_\_\_\_ PG \_\_\_\_, HMA for \_\_\_\_ Cl. \_\_\_\_ PG \_\_\_\_, and Commercial HMA will be measured by the ton in accordance with Section 1-09.2, with no deduction being made for the weight of asphalt binder, mineral filler, or any other component of the HMA. If the Contractor elects to remove and replace HMA as allowed by Section 5-04.3(11), the material removed will not be measured.

Roadway cores will be measured per each for the number of cores taken.

Crack Sealing-LF will be measured by the linear foot along the line of the crack.

Soil residual herbicide will be measured by the mile for the stated width to the nearest 0.01 mile or by the square yard, whichever is designated in the Proposal.

Pavement repair excavation will be measured by the square yard of surface marked prior to excavation.

Asphalt for fog seal will be measured by the ton, as provided in Section 5-02.4.

Longitudinal joint seals between the HMA and cement concrete pavement will be measured by the linear foot along the line and slope of the completed joint seal.

HMA sawcut and seal, and paved panel joint seal, will be measured by the linear foot along the line and slope of the completed joint seal.

Planing bituminous pavement will be measured by the square yard.

Temporary pavement marking will be measured by the linear foot as provided in Section 8-23.4.

Water will be measured by the M gallon as provided in Section 2-07.4.

#### 5-04.5 Payment

Payment will be made for each of the following Bid items that are included in the Proposal:

“HMA Cl. \_\_\_\_ PG \_\_\_\_, per ton.

“HMA for Approach Cl. \_\_\_\_ PG \_\_\_\_, per ton.

“HMA for Preleveling Cl. \_\_\_\_ PG \_\_\_\_, per ton.

“HMA for Pavement Repair Cl. \_\_\_\_ PG \_\_\_\_, per ton.

“Commercial HMA”, per ton.

The unit Contract price per ton for “HMA Cl. \_\_\_\_ PG \_\_\_\_, “HMA for Approach Cl. \_\_\_\_ PG \_\_\_\_, “HMA for Preleveling Cl. \_\_\_\_ PG \_\_\_\_, “HMA for Pavement Repair Cl. \_\_\_\_ PG \_\_\_\_, and “Commercial HMA” shall be full compensation for all costs, including anti-stripping additive, incurred to carry out the requirements of Section 5-04 except for those costs included in other items which are included in this Subsection and which are included in the Proposal.

“Crack Sealing-FA”, by force account.



1 “Crack Sealing-FA” will be paid for by force account as specified in Section 1-09.6.  
2 For the purpose of providing a common Proposal for all Bidders, the Contracting  
3 Agency has entered an amount in the Proposal to become a part of the total Bid by  
4 the Contractor.

5  
6 “Crack Sealing-LF”, per linear foot.  
7 The unit Contract price per linear foot for “Crack Sealing-LF” shall be full payment  
8 for all costs incurred to perform the Work described in Section 5-04.3(4)A.

9  
10 “Soil Residual Herbicide \_\_\_\_ ft. Wide”, per mile, or  
11 “Soil Residual Herbicide”, per square yard.  
12 The unit Contract price per mile or per square yard for “Soil Residual Herbicide”  
13 shall be full payment for all costs incurred to obtain, provide and install herbicide in  
14 accordance with Section 5-04.3(4)B.

15  
16 “Pavement Repair Excavation Incl. Haul”, per square yard.  
17 The unit Contract price per square yard for “Pavement Repair Excavation Incl.  
18 Haul” shall be full payment for all costs incurred to perform the Work described in  
19 Section 5-04.3(4)C with the exception, however, that all costs involved in the  
20 placement of HMA shall be included in the unit Contract price per ton for “HMA for  
21 Pavement Repair Cl. \_\_\_\_ PG \_\_\_\_”, per ton.

22  
23 “Asphalt for Fog Seal”, per ton.  
24 Payment for “Asphalt for Fog Seal” is described in Section 5-02.5.

25  
26 “Longitudinal Joint Seal”, per linear foot.  
27 The unit Contract price per linear foot for “Longitudinal Joint Seal” shall be full  
28 payment for all costs incurred to construct the longitudinal joint between HMA and  
29 cement concrete pavement, as described in Section 5-04.3(12)B.

30  
31 “HMA Sawcut And Seal”, per linear foot.  
32 The unit Contract price per linear foot for “HMA Sawcut And Seal” shall be full  
33 payment for all costs incurred to perform the Work described in  
34 Section 5-04.3(12)B1.

35  
36 “Paved Panel Joint Seal”, per linear foot.  
37 The unit Contract price per linear foot for “Paved Panel Joint Seal” shall be full  
38 payment for all costs incurred to perform the Work described in  
39 Section 5-04.3(12)B2.

40  
41 “Planing Bituminous Pavement”, per square yard.  
42 The unit Contract price per square yard for “Planing Bituminous Pavement” shall  
43 be full payment for all costs incurred to perform the Work described in  
44 Section 5-04.3(14).

45  
46 “Temporary Pavement Marking”, per linear foot.  
47 Payment for “Temporary Pavement Marking” is described in Section 8-23.5.

48  
49 “Water”, per M gallon.  
50 Payment for “Water” is described in Section 2-07.5.

“Job Mix Compliance Price Adjustment”, by calculation.

“Job Mix Compliance Price Adjustment” will be calculated and paid for as described in Section 5-04.3(9)B6 and 5-04.3(9)D1.

“Compaction Price Adjustment”, by calculation.

“Compaction Price Adjustment” will be calculated and paid for as described in Section 5-04.3(10)C3.

“HMA Core – Bridge”, per each.

The unit Contract price per each for “HMA Core – Bridge” shall be full payment for all costs, including traffic control, associated with taking HMA density cores in pavement that is on a bridge deck.

“HMA Core – Roadway”, per each.

The unit Contract price per each for “HMA Core – Roadway” shall be full payment for all costs, including traffic control, associated with taking HMA density cores in pavement that is not on a bridge deck.

“Cyclic Density Price Adjustment”, by calculation.

“Cyclic Density Price Adjustment” will be calculated and paid for as described in Section 5-04.3(10)B.

5-05.AP5

## **Section 5-05, Cement Concrete Pavement**

**January 3, 2017**

### **5-05.3(1) Concrete Mix Design for Paving**

In last sentence of the second paragraph of item number 1, the reference to “Section 9-01.2(4)” is revised to read “Section 9-01.2(1)B”.

The following is inserted after item number 2:

3. **Mix Design Modifications** - The Contractor may initiate adjustments to the aggregate proportions of the approved mix design. An adjustment in both the fine and coarse aggregate batch target weights of plus or minus 200 pounds per cubic yard will be allowed without resubmittal of the mix design. The adjusted aggregate weights shall become the new batch target weights for the mix design.

Item number 3 is renumbered to 4 and revised (up until the table) to read:

4. **Conformance to Mix Design** - Cement and coarse and fine aggregate weights shall be within the following tolerances of the batch target weights of the mix design:

| <b>Portland Cement Concrete Batch Weights</b> |     |     |
|-----------------------------------------------|-----|-----|
| Cement                                        | +5% | -1% |
| Coarse Aggregate                              | +2% | -2% |
| Fine Aggregate                                | +2% | -2% |

### 5-05.3(3)B Mixing Equipment

The last sentence of item number 4 is revised to read:

Plant-mixed concrete may be transported in nonagitated vehicles provided that the concrete is in a workable condition when placed and:

- a. discharge is completed within 45 minutes after the introduction of mixing water to the cement and aggregates, or
- b. discharge is completed within 60 minutes after the introduction of mixing water to the cement and aggregates, provided the concrete mix temperature is 70°F or below during placement, or
- c. discharge is completed within 60 minutes after the introduction of mixing water to the cement and aggregates, provided the mix contains an approved set retarder at the manufacturer's minimum dosage rate.

### 5-05.3(6) Subgrade

This section, including title, is revised to read:

#### 5-05.3(6) Surface Preparation

The Subgrade surface shall be prepared and compacted a minimum of 3 feet beyond each edge of the area which is to receive concrete pavement in order to accommodate the slip-form equipment.

Concrete shall not be placed during a heavy rainfall. Prior to placing concrete:

1. The surface shall be moist;
2. Excess water (e.g., standing, pooling or flowing) shall be removed from the surface.
3. The surface shall be clean and free of any deleterious materials.
4. The surface temperature shall not exceed 120°F or be frozen.

### 5-05.3(7)A Slip-Form Construction

The second sentence of the first paragraph is revised to read:

The alignment and elevation of the paver shall be regulated from outside reference lines established for this purpose, or by an electronic control system capable of controlling the line and grade within required tolerances.

6-02.AP6

## Section 6-02, Concrete Structures August 7, 2017

### 6-02.2 Materials

The item "Elastomeric Bearing Pads" is revised to read "Fabricated Bridge Bearing Assemblies".

1  
2 **6-02.3(2) Proportioning Materials**

3 In the sixth paragraph, the reference to "Section 9-01.2(4)" is revised to read "9-01.2(1)B".  
4

5 **6-02.3(2)A Contractor Mix Design**

6 The following new sentence is inserted after the first sentence of the third paragraph:  
7

8       The mix design submittal shall also include test results no older than one year showing  
9       that the Aggregates do not contain Deleterious Substances in accordance with Section  
10       9-03.  
11

12 **6-02.3(2)A1 Contractor Mix Design for Concrete Class 4000D**

13 Item number 4 of the first paragraph is deleted.  
14

15 Items number 5, 6, and 7 of the first paragraph are renumbered to 4, 5, and 6, respectively.  
16

17 The following new sentence is inserted after the second sentence of the last paragraph:  
18

19       Mix designs using shrinkage reducing admixture shall state the specific quantity  
20       required.  
21

22 The following new sentence is inserted before the last sentence of the last paragraph:  
23

24       Testing samples of mixes using shrinkage reducing admixture shall use the admixture  
25       amount specified in the mix design submittal.  
26

27 **6-02.3(2)B Commercial Concrete**

28 The last sentence of the first paragraph is revised to read:  
29

30       Commercial concrete does not require mix design or source approvals for cement,  
31       aggregate, and other admixtures.  
32

33 **6-02.3(5)G Sampling and Testing for Temperature, Consistency and Air**  
34 **Content**

35 The last three paragraphs are revised to read:  
36

37       Sampling and testing will be performed before concrete placement from the first load.  
38       Concrete shall not be placed until all tests have been completed by the Engineer, and  
39       the results indicate that the concrete is within acceptable limits. If the concrete is not  
40       within acceptable limits, sampling and testing will continue before concrete placement  
41       for each load until one load meets all of the applicable acceptance requirements. After  
42       one test indicates that the concrete is within specified limits, the concrete may be  
43       placed and the sampling and testing frequency may decrease to one for every  
44       100 cubic yards. Sampling shall be performed in accordance with FOP for WAQTC  
45       TM 2 and random samples shall be selected in accordance with WSDOT T 716. After  
46       the first acceptable load of concrete, up to ½ cubic yard may be placed from  
47       subsequent loads to be tested prior to testing for acceptance.  
48

49       When the results for any subsequent acceptance test indicates that the concrete as  
50       delivered and approved by the Contractor for placement does not conform to the

specified limits, the sampling and testing frequency will be resumed for each load. Whenever one subsequent test indicates that the concrete is within the specified limits, the random sampling and testing frequency of one for every 100 cubic yards may resume.

Sampling and testing for a placement of one class of concrete consisting of 50 cubic yards or less will be as listed above, except that after one set of tests indicate that the concrete is within specified limits, the remaining concrete to be placed may be accepted by visual inspection.

#### **6-02.3(6)A1 Hot Weather Protection**

This section is revised to read:

The Contractor shall provide concrete within the specified temperature limits. Cooling of the coarse aggregate piles by sprinkling with water is permitted provided the moisture content is monitored and the mixing water is adjusted for the free water in the aggregate. Shading or cooling aggregate piles (sprinkling of fine aggregate piles with water is not allowed). If sprinkling of the coarse aggregates is to be used, the piles moisture content shall be monitored and the mixing water adjusted for the free water in the aggregate. In addition, when removing the coarse aggregate, it shall be removed from at least 1 foot above the bottom of the pile. Refrigerating mixing water; or replacing all or part of the mixing water with crushed ice, provided the ice is completely melted by placing time.

If air temperature exceeds 90°F, the Contractor shall use water spray or other accepted methods to cool all concrete-contact surfaces to less than 90°F. These surfaces include forms, reinforcing steel, steel beam flanges, and any others that touch the mix.

#### **6-02.3(6)A2 Cold Weather Protection**

This section is revised to read:

Concrete shall be maintained at or above a temperature of 40°F during the first seven days of the Cold Weather Protection Period and at or above a temperature of 35°F during the remainder of the Cold Weather Protection Period. Cold weather protection requirements do not apply to concrete in shafts and piles placed below the ground line.

Prior to placing concrete in cold weather, the Contractor shall submit a Type 2 Working Drawing with a written procedure for cold weather concreting. The procedure shall detail how the Contractor will adequately cure the concrete and prevent the concrete temperature from falling below the minimum temperature. Extra protection shall be provided for areas especially vulnerable to freezing (such as exposed top surfaces, corners and edges, thin sections, and concrete placed into steel forms). Concrete placement will only be allowed if the Contractor's cold weather protection plan has been accepted by the Engineer.

Prior to concrete placement, the Contractor shall review the 7-day temperature predictions for the job site from the Western Region Headquarters of the National Weather Service ([www.wrh.noaa.gov](http://www.wrh.noaa.gov)). When temperatures below 35°F are predicted, the Contractor shall:

1. Install temperature sensors in each concrete placement. One sensor shall be installed for every 100 cubic yards of concrete placed. Sensors shall be installed at locations directed by the Engineer, and shall be placed 1.5 inches from the face of concrete.
2. Immediately after concrete placement, temperature sensors shall be installed on the concrete surface at locations directed by the Engineer. One sensor shall be installed for every 100 cubic yards of concrete placed.

Temperatures shall be measured and recorded a minimum of every hour for the duration of the Cold Weather Protection Period. Temperature data shall be submitted to the Engineer as a Type 1 Working Drawing within three days following the end of the Cold Weather Protection Period.

For each day that the concrete temperature falls below 40°F during the first seven days of the Cold Weather Protection Period, no curing time is awarded for that day and the Cold Weather Protection Period is extended for one additional day. If the concrete temperature falls below 35°F during the Cold Weather Protection Period, the concrete may be rejected by the Engineer.

#### **6-02.3(7) Concrete Exposed to Sea Water**

This section including title is revised to read:

#### **6-02.3(7) Vacant**

#### **6-02.3(8) Concrete Exposed to Alkaline Soils or Water**

This section including title is revised to read:

#### **6-02.3(8) Vacant**

#### **6-02.3(10)D4 Monitoring Bridge Deck Concrete Temperature After Placement**

This section is revised to read:

The Contractor shall measure and record the concrete temperature and ambient temperature a minimum of every hour for seven calendar days after concrete placement. The Contractor shall place two temperature sensors in the bridge deck at locations specified by the Engineer. The Contractor shall measure ambient temperature near the locations where concrete temperature is being measured. When the bridge deck is being enclosed and heated to meet cold weather requirements, ambient temperature readings shall be taken within the enclosure. The Contractor shall submit the concrete temperature and ambient temperature data as a Type 1 Working Drawing in spreadsheet format within 14 calendar days from placing the bridge deck concrete.

The Contractor shall submit a Type 1 Working Drawing consisting of the type and model of each device and the method used to measure and record the temperatures.

1 **6-02.3(13)A Strip Seal Expansion Joint System**

2 The first paragraph is revised to read:

3  
4 The Contractor shall submit Type 2 Working Drawings consisting of the strip seal  
5 expansion joint shop drawings. These plans shall include, at a minimum, the following:

- 6  
7 1. Plan, elevation, and sections of the joint system and all components, with  
8 dimensions and tolerances.  
9  
10 2. All material designations.  
11  
12 3. Manufacturer's written installation procedure. The installation procedure shall  
13 indicate how the extrusions set into the two sides of the joint will be allowed to  
14 move independently of one another.  
15  
16 4. Corrosion protection system used on the metal components.  
17  
18 5. Locations of welded shear studs, lifting mechanisms, temperature setting  
19 devices, and construction adjustment devices.  
20  
21 6. Method of sealing the system to prevent leakage of water through the joint.  
22  
23 7. Details of the temporary supports for the steel extrusions while the  
24 encapsulating concrete of the headers is placed and cured.  
25  
26 8. The gland installation procedure, including the means and methods used to  
27 install the gland and assure correct seating of the gland within the steel  
28 extrusions.  
29

30 The following new paragraph is inserted after the third paragraph:

31  
32 If the gland is installed in the field, the Contractor shall have the services of a strip seal  
33 expansion joint system manufacturer's technical representative physically present at  
34 the job site. The manufacturer's technical representative shall train the Contractor's  
35 personnel performing the field installation of the gland, provide technical assistance for  
36 installing the gland, and observe and inspect the installation of at least the first  
37 complete joint.  
38

39 The second to last paragraph is deleted.

40  
41 **6-02.3(14)D General Requirements for Concrete Surface Finishes Produced**  
42 **by Form Liners**

43 The first two sentences of the third paragraph are deleted.

44  
45 **6-02.3(16) Plans for Falsework and Formwork**

46 The last sentence of the first paragraph is revised to read:

47  
48 A submittal is not required for footing or retaining wall formwork if the concrete  
49 placement is 4 feet or less in height.  
50

The second to last paragraph is revised to read:

The Contractor shall furnish associated design calculations to the Engineer as part of the submittal. The design calculations shall include the structural and geotechnical design of the foundation and shall show the stresses and deflections in all load-carrying members that are part of the falsework system. Construction details which may be shown in the form of sketches on the calculation sheets shall be shown in the falsework or formwork drawings as well. Falsework or formwork plans will not be accepted in cases where it is necessary to refer to the calculation sheets for information needed for complete understanding of the falsework and formwork plans or how to construct the falsework and formwork.

The last paragraph is deleted.

#### **6-02.3(17)D Falsework Support Systems: Piling, Temporary Concrete Footings, Timber Mudsills, Manufactured Shoring Towers, Caps, and Posts**

This section, including title, is revised to read:

##### **6-02.3(17)D Falsework Support Systems: Foundations, Manufactured Shoring Towers, Caps, and Posts**

Foundations for falsework shall be designed for conditions stated in this Section using methods shown in the AASHTO Standard Specifications for Highway Bridges Seventeenth Edition – 2002 for allowable stress design, the AASHTO LRFD Bridge Design Specifications for load and resistance factor design or the AASHTO Guide Design Specifications for Bridge Temporary Works. Allowable stresses for materials shall not exceed stresses and conditions allowed by Section 6-02.3(17)B.

##### **6-02.3(17)D1 Piling**

This section including title is revised to read:

##### **6-02.3(17)D1 Vacant**

##### **6-02.3(17)D2 Temporary Concrete Footings and Timber Mudsills**

This section including title is revised to read:

##### **6-02.3(17)D2 Vacant**

##### **6-02.3(17)D4 Manufactured Shoring Tower Systems and Devices**

The fifth paragraph is deleted.

##### **6-02.3(17)D5 Cross-Braced Type Base Frames**

This section is deleted in its entirety.

##### **6-02.3(17)D6 Ladder Type Base Frames**

This section is deleted in its entirety.

##### **6-02.3(17)D7 Intermediate Strength Shoring**

This section is deleted in its entirety.



1 **6-02.3(17)D8 Heavy-Duty Shoring Systems**

2 This section is deleted in its entirety.

4 **6-02.3(17)K Concrete Forms on Steel Spans**

5 In the last paragraph, "ASTM A325" is revised to read "ASTM F3125 Grade A325".

7 **6-02.3(17)N Removal of Falsework and Forms**

8 The fifth paragraph is deleted.

10 **6-02.3(19)A Vacant**

11 This section, including title, is revised to read:

13 **6-02.3(19)A Submittals of Acceptance Test Reports and Certificates**

14 The Contractor shall submit the following production samples and test reports and  
15 certificates for fabricated bridge bearing assemblies as applicable:

- 17 1. A Type 2 Working Drawing consisting of a six-inch square by 1/8-inch thick  
18 sample of PTFE taken from the lot of production material.
- 20 2. A Type 2 Working Drawing consisting of a six-inch square by 1-inch thick  
21 sample of pre-formed fabric pad taken from the lot of production material.
- 23 3. Type 1 Working Drawings consisting of Manufacturers' Certificates of  
24 Compliance for the PTFE, polyether urethane, pre-formed fabric pad duck,  
25 silicone grease, epoxy gel, and resin filler.
- 27 4. Type 1 Working Drawings consisting of certified mill test reports for all steel  
28 and stainless steel in the bearing assemblies.
- 30 5. Type 1 Working Drawings consisting of certified test reports confirming that  
31 the pre-formed fabric pads meet the specific requirements of proof load.

33 **6-02.3(24)A Field Bending**

34 This section (excluding the tables) is revised to read:

36 Field bending of AASHTO M31 Grade 60 and ASTM A706 Grade 60 reinforcement  
37 shall be done in accordance with the requirements of this section. Field bending of all  
38 other reinforcement shall require a Type 2 Working Drawing showing the bend radii,  
39 bending and heating procedures, and any inspection or testing requirements.

41 Field bending shall not be done on reinforcement within the top or bottom third of  
42 column lengths or within plastic hinge regions identified in the Plans. Field bending  
43 shall not be done on bar sizes No. 14 or No. 18.

45 In field-bending steel reinforcing bars, the Contractor shall:

- 47 1. Make the bend gradually using a bending tool equipped with a bending  
48 diameter as listed in Table 1. Bending shall not be done by means of hammer  
49 blows and pipe sleeves. When bending to straighten a previously bent bar,  
50 move a hickey bar progressively around the bend.

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2. Apply heat as described below for bending bar sizes No. 6 through No. 11 and for bending bar sizes No. 5 and smaller when the bars have been previously bent. Previously unbent bars of sizes No. 5 and smaller may be bent without heating when the bar temperature is 40°F or higher. When previously unbent bars of sizes No. 5 and smaller have a bar temperature lower than 40°F, they shall be heated to within the range of 100°F to 150°F prior to bending. In applying heat for field-bending steel reinforcing bars, the Contractor shall:
    - a. Avoid damage to the concrete by insulating any concrete within 6 inches of the heated bar area;
    - b. Apply two heat tips simultaneously at opposite sides of bar sizes No. 7 or larger;
    - c. Heat the bar to within the required temperature range shown in Table 2 as verified by using temperature-indicating crayons or other suitable means;
    - d. Heat a minimum bar length as shown in Table 3. Locate the heated section of the bar to include the entire bending length;
    - e. Bend immediately after the required temperature range has been achieved. Maintain the bar within the required temperature range during the entire bending process;
    - f. Do not cool bars artificially with water, forced air, or other means.
  3. Limit any bend or straightening to these maximum angles: 135 degrees for bar sizes No. 8 or smaller, and 90 degrees for bar sizes No. 9 through No. 11.
  4. Repair epoxy coating on epoxy coated bars in accordance with Section 6-02.3(24)H.

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### 6-02.3(25) Prestressed Concrete Girders

Under the heading “**Prestressed Concrete Slab Girder**”, the second sentence is deleted.

39  
40  
41

### 6-02.3(25)A Shop Drawings

The sixth paragraph is deleted.

42  
43  
44  
45

### 6-02.3(25)F Prestress Release

The last two sentences of the last paragraph are deleted and replaced with the following single sentence:

46 This request shall be submitted as a Type 2E Working Drawing analyzing changes in  
47 vertical deflection, girder lateral stability and concrete stresses in accordance with  
48 Section 6-02.3(25)L2.  
49

**6-02.3(25)H Finishing**

Item number 2 in the first paragraph is revised to read:

2. The bottoms, sides, and tops of the lower flanges on all girders, including the top of the bottom slab between the tub girder webs.

**6-02.3(25)I Fabrication Tolerances**

Items 4 and 5 in the first paragraph are revised to read:

4. Flange Depth:  $\pm \frac{1}{4}$  inch
5. Strand Position:  
Individual strands:  $\pm \frac{1}{4}$  inch  
Bundled strands:  $\pm \frac{1}{2}$  inch  
Harped strand group center of gravity at the girder ends:  $\pm 1$  inch

Items 7, 8, 9 and 10 in the first paragraph are revised to read:

7. Position of an Interior Void, vertically and horizontally:  $\pm \frac{1}{2}$  inch.
8. Bearing Recess (center of recess to girder end):  $\pm \frac{5}{8}$  inch.
9. Girder Ends (deviation from square or designated skew):  
Horizontal:  $\pm \frac{1}{8}$  inch per foot of girder width, up to a maximum of  $\pm \frac{1}{2}$  inch  
Vertical:  $\pm \frac{3}{16}$  inch per foot of girder depth, up to a maximum of  $\pm 1$  inch
10. Bearing Area Deviation from Plane (in length or width of bearing):  $\pm \frac{1}{8}$  inch

Items 14 and 15 in the first paragraph are revised to read:

14. Local smoothness of any surface:  $\pm \frac{1}{4}$  inch in 10 feet.
15. Differential Camber between Girders in a Span (measured in place at the job site):

|                                                                                                        |                                                                                                                    |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| For wide flange deck and deck bulb tee girders with a cast-in-place reinforced concrete deck:          | Cambers shall be equalized when the differences in cambers between adjacent girders exceeds $\pm \frac{3}{4}$ inch |
| For wide flange deck, deck bulb tee and slab girders without a cast-in-place reinforced concrete deck: | Cambers shall be equalized when the differences in cambers between adjacent girders exceeds $\pm \frac{1}{4}$ inch |

Item 17 in the first paragraph is revised to read:

17. Position of Lifting Embedments:  $\pm 3$  inches longitudinal,  $\pm \frac{1}{4}$  inch transverse.

### 6-02.3(25)J Horizontal Alignment

This section is revised to read:

The Contractor shall check and record the horizontal alignment (sweep) of each girder at the following times:

1. Initial – Upon removal of the girder from the casting bed
2. Shipment – Within 14 days prior to shipment; and
3. Erection – After girder erection and cutting temporary top strands but prior to any equalization, welding ties or placement of diaphragms.

Horizontal alignment of the top and bottom flanges shall be checked and recorded. Alternatively, the Contractor may check and record the horizontal alignment of the web near mid-height of the girder. Each check shall be made by measuring the maximum offset at mid-span relative to a chord that starts and stops at the girder ends. The Contractor shall check and record the alignment at a time when the girder is not influenced by temporary differences in surface temperature. Records for the initial check (item 1 above) shall be included in the Contractor's prestressed concrete certificate of compliance. Records for all other checks shall be submitted as a Type 1 Working Drawing.

For each check (Items 1 to 3 above), the alignment shall not be offset more than  $\frac{1}{8}$  inch for each 10 feet of girder length. Girders not meeting this tolerance for the shipment check (Item 2 above) shall require an analysis of girder lateral stability and stresses in accordance with Section 6-02.3(25)L1. The Contractor shall perform this analysis and submit it as a Type 2E Working Drawing prior to shipment of the girder. Any girder that exceeds an offset of  $\frac{1}{8}$  inch for each 10 feet of girder length for the erection check (Item 3 above) shall be corrected at the job site to the  $\frac{1}{8}$  inch maximum offset per 10 feet of girder length before concrete is placed into the diaphragms. The Contractor shall submit a Type 2 Working Drawing for any required corrective action.

The maximum distance between the side of a prestressed concrete slab girder, or the edge of the top flange of a wide flange deck, wide flange thin deck or deck bulb tee girder, and a chord that extends the full length of the girder shall be  $\pm\frac{1}{2}$  inch after erection (Item 3 above).

### 6-02.3(25)K Vertical Deflection

Items 2 and 3 in the first paragraph are revised to read:

2. Shipment – Within 14 days prior to shipment;
3. Erection – After girder erection and cutting temporary top strands but prior to any equalization, welding ties or placement of diaphragms.

The following new paragraph is inserted after the second paragraph:

Girders with vertical deflections not meeting the limit shown in the Plans for the shipment check (Item 2 above) shall require an analysis of girder lateral stability and

stresses in accordance with Section 6-02.3(25)L1. The Contractor shall perform this analysis and submit it as a Type 2E Working Drawing prior to shipment.

The following new sentence is inserted after the second sentence of the fourth to last paragraph:

Any diaphragms are assumed to be placed.

The last three paragraphs are deleted and replaced with the following:

If the girder vertical deflection measured for the erection check (Item 3 above) is not between the lower "D" dimension bound shown in the Plans and the upper "D" dimension bound shown in the Plans plus  $\frac{3}{4}$  inches, the Engineer may require corrective action. The Contractor shall submit a Type 2 Working Drawing for any required corrective action.

#### **6-02.3(25)L Handling and Storage**

The second paragraph is revised to read:

For strand lift loops, only  $\frac{1}{2}$ -inch diameter or 0.6-inch diameter strand conforming to Section 9-07.10 shall be used, and a minimum 2-inch diameter straight pin of a shackle shall be used through the loops. Multiple loops shall be held level in the girder during casting in a manner that allows each loop to carry its share of the load during lifting. The minimum distance from the end of the girder to the centroid of the strand lift loops shall be 3 feet. The loops for all prestressed concrete girders, with the exception of prestressed concrete slab girders, shall project a minimum of 1'-6" from the top of the girder. The loops for prestressed concrete slab girders shall project a minimum of 4 inches. Loops shall extend to within 3 inches clear of the bottom of the girder, terminating with a 9-inch long 90-degree hook. Loads on individual loops shall be limited to 12 kips, and all girders shall be picked up at a minimum angle of 60 degrees from the top of the girder.

The third sentence of the fourth paragraph is revised to read:

Alternatively, these temporary strands may be post-tensioned provided the strands are stressed on the same day that the permanent prestress is released into the girder and the strands are tensioned prior to lifting the girder.

The second to last sentence of the fourth paragraph is revised to read:

When the post-tensioned alternative is used, the Contractor shall be responsible for properly sizing the anchorage plates, and configuring the reinforcement adjacent to the anchorage plates, to prevent bursting or splitting of the concrete in the top flange.

The second to last paragraph is deleted.

This section is supplemented with the following new subsections:

#### **6-02.3(25)L1 Girder Lateral Stability and Stresses**

The Contractor shall be responsible for safely lifting, storing, shipping and erecting prestressed concrete girders.

The Contract documents may provide shipping and handling details for girders including lifting embedment locations ( $L$ ), shipping support locations ( $L_1$  and  $L_2$ ), minimum shipping support rotational spring constants ( $K_\theta$ ), minimum shipping support center-to-center wheel spacings ( $W_{cc}$ ), vertical deflections and number of temporary top strands. These shipping and handling details have been determined in accordance with Section 6-02.3(25)L2.

The Contractor shall submit a Type 2E Working Drawing analyzing girder lateral stability and concrete stresses during lifting, storage, shipping and erection in accordance with Section 6-02.3(25)L2 in the following cases:

1. Any of the analysis assumptions listed in Section 6-02.3(25)L2 are invalid. Determination of validity shall be made by the Contractor, except that analysis assumptions shall be considered invalid if the actual values are outside of the provided tolerances.
2. The Contractor intends to alter the shipping and handling details provided in the Contract documents.
3. The Contract documents do not provide shipping and handling details.

#### **6-02.3(25)L2 Lateral Stability and Stress Analysis**

Analysis for girder lateral stability and concrete stresses during lifting, storage, shipping and erection shall be in accordance with the PCI Recommended Practice for Lateral Stability of Precast, Prestressed Concrete Bridge Girders, First Edition, Publication CB-02-16-E and the AASHTO LRFD Bridge Design Specifications edition identified in the Contract documents. The following design criteria shall be met:

1. Factor of Safety against cracking shall be at least 1.0
2. Factor of Safety against failure shall be at least 1.5
3. Factor of Safety against rollover shall be at least 1.5
4. Allowable concrete stresses shall be as specified in Section 6-02.3(25)L3

The analysis shall address any effects on girder vertical deflection (camber), "A" dimensions at centerline of bearings and deck screed cambers (C).

Shipping and handling details provided in the Contract documents have been determined using the following analysis assumptions:

1. Girder dimensions, strand locations and lifting embedment locations are within the tolerances specified in Section 6-02.3(25)I
2. Girder horizontal alignment (sweep) is within the tolerance specified in Section 6-02.3(25)J
3. Girder vertical deflection (camber) at midspan is less than or equal to the value shown in the Plans for shipping

4. Minimum concrete compressive strength at release ( $f'_{ci}$ ) has been reached before initial lifting from casting bed. Minimum concrete compressive strength at 28 days ( $f'_c$ ) has been reached before shipping.
5. Height of girder bottom above roadway at shipping supports is less than or equal to 72 inches
6. Height of shipping support roll center above roadway is 24 inches,  $\pm 2$  inches
7. Shipping support longitudinal placement ( $L_1$  and  $L_2$ ) tolerance is  $\pm 6$  inches
8. Shipping support lateral placement tolerance is  $\pm 1$  inches
9. Shipping supports provide the minimum shipping support rotational spring constant ( $K_\theta$ ) and minimum shipping support center-to-center wheel spacings ( $W_{cc}$ ) shown in the Plans
10. For shipping at highway speeds a  $\pm 20\%$  dynamic load allowance (impact) is included with a typical roadway superelevation of 2%
11. For turning at slow speeds, no dynamic load allowance (impact) is included with a maximum roadway superelevation of 6%
12. Wind, centrifugal and seismic forces are not considered

#### **6-02.3(25)L3 Allowable Stresses**

Prestressed concrete girder stresses shall be limited to the following values at all stages of construction and in service:

| Condition                                                 | Stress      | Location                                                                                     | Allowable Stress (ksi)                 |
|-----------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------|----------------------------------------|
| Temporary Stress at Transfer and Lifting from Casting Bed | Tensile     | In areas without bonded reinforcement sufficient to resist the tensile force in the concrete | $0.0948\lambda\sqrt{f'_{ci}} \leq 0.2$ |
|                                                           |             | In areas with bonded reinforcement sufficient to resist the tensile force in the concrete    | $0.24\lambda\sqrt{f'_{ci}}$            |
|                                                           | Compressive | All locations                                                                                | $0.65f'_{ci}$                          |
| Temporary Stress at Shipping and Erection                 | Tensile     | In areas without bonded reinforcement sufficient to resist the tensile force in the concrete | $0.0948\lambda\sqrt{f'_c} \leq 0.2$    |
|                                                           |             | In areas with bonded reinforcement sufficient to resist the tensile force in the concrete    | $0.19\lambda\sqrt{f'_c}$               |

| Condition                      | Stress      | Location                                                                                                                                     | Allowable Stress (ksi)   |
|--------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|                                |             | In areas with bonded reinforcement sufficient to resist the tensile force in the concrete when shipping at 6% superelevation, without impact | $0.24\lambda\sqrt{f'_c}$ |
|                                | Compressive | All locations                                                                                                                                | $0.65f'_c$               |
| Final Stresses at Service Load | Tensile     | Precompressed tensile zone                                                                                                                   | 0.0                      |
|                                | Compressive | Effective prestress and permanent loads                                                                                                      | $0.45f'_c$               |
|                                |             | Effective prestress, permanent loads and transient (live) loads                                                                              | $0.60f'_c$               |
| Final Stresses at Fatigue Load | Compressive | Fatigue I Load Combination plus one-half effective prestress and permanent loads                                                             | $0.40f'_c$               |

Variables are as defined in the AASHTO LRFD Bridge Design Specifications.

### 6-02.3(25)M Shipping

The last four paragraphs are deleted and replaced with the following:

Girder lateral stability and stresses during shipping shall be in accordance with Section 6-02.3(25)L1.

If the Contractor elects to assemble spliced prestressed concrete girders into shipping configurations not shown in the Contract documents, the Contractor shall submit a Type 2E Working Drawing analyzing girder lateral stability and concrete stresses in accordance with Section 6-02.3(25)L2 before shipping.

### 6-02.3(25)N Prestressed Concrete Girder Erection

The second sentence of the first paragraph is revised to read:

The erection plan shall conform to Section 6-02.3(25)L1.

The last paragraph is revised to read:

Stop plates and dowel bars for prestressed concrete girders shall be set with either epoxy grout conforming to Section 9-26.3 or type IV epoxy bonding agent conforming to Section 9-26.1.



### **6-02.3(25)O Girder to Girder Connections**

The second paragraph is revised to read:

Prestressed concrete girders shall be constructed in the following sequence:

1. If required, deflections shall be equalized in accordance with the Contractor's equalization plan.
2. Any intermediate diaphragms shall be placed and any weld ties shall be welded in accordance with Section 6-03.3(25). Welding ground shall be attached directly to the steel plates being welded when welding the weld-ties.
3. Any keyways between adjacent girders shown in the Plans to receive grout shall be filled flush with the surrounding surfaces using a grout conforming to Section 9-20.3(2).
4. Equalization equipment shall not be removed and other construction equipment shall not be placed on the structure until intermediate diaphragms and keyway grout have attained a minimum compressive strength of 2,500 psi.

### **6-02.3(26)D2 Test Block Dimensions**

The first sentence is revised to read:

The dimensions of the test block perpendicular to the tendon in each direction shall be the smaller of twice the minimum edge distance or the minimum spacing specified by the special anchorage device manufacturer, with the stipulation that the concrete cover over any confining reinforcing steel or supplementary skin reinforcement shall be appropriate for the project-specific application and circumstances.

### **6-02.3(26)E2 Ducts for External Exposed Installation**

In the first paragraph, "ASTM D3350" is revised to read "ASTM D3035".

In the fourth paragraph, "ASTM D3505" is revised to read "ASTM D3035".

### **6-02.3(26)G Tensioning**

Item number 1 of the second paragraph is revised to read:

1. All concrete has reached a compressive strength of at least 4,000 psi or the strength specified in the Plans. When tensioning takes place prior to 28-day compressive strength testing on concrete sampled in accordance with Section 6-02.3(25)H, compressive strength shall be verified on field cured cylinders in accordance with the FOP for AASHTO T23.

### **6-02.3(27)A Use of Self-Consolidating Concrete for Precast Units**

Item number 2 of the first paragraph is revised to read:

2. Precast reinforced concrete three-sided structures, box culverts and split box culverts in accordance with Section 7-02.3(6).

6-03.AP6

## **Section 6-03, Steel Structures**

**January 3, 2017**

### **6-03.3(33) Bolted Connections**

In this section, "AASHTO M253" is revised to read "ASTM F3125 Grade A490", "ASTM F1852" is revised to read "ASTM F3125 Grade F1852", and "ASTM A325" is revised to read "ASTM F3125 Grade A325".

In the headings of Table 3, "A 325" is revised to read "ASTM F3125 Grade A325".

In the headings of Table 3, "M 253" is revised to read "ASTM F3125 Grade A490".

6-05.AP6

## **Section 6-05, Piling**

**August 1, 2016**

In this section, the words "capacity" and "capacities" are replaced with "resistance" and "resistances", respectively.

### **6-05.3(1) Piling Terms**

The third paragraph is revised to read:

**Overdriving** – Over-driving of piles occurs when the ultimate bearing resistance calculated from the equation in Section 6-05.3(12), or the wave equation driving criteria if applicable, exceeds the ultimate bearing resistance required in the Contract in order to reach the minimum tip elevation specified in the Contract, or as required by the Engineer.

The first sentence of the last paragraph is revised to read:

**Minimum Tip Elevation** – The minimum tip elevation is the elevation to which the pile tip shall be driven.

### **6-05.3(3)A Casting and Stressing**

The last sentence of the third paragraph is revised to read:

If the corrective action is not acceptable to the Engineer, the piling(s) will be subject to rejection by the Engineer.

### **6-05.3(5) Manufacture of Steel Piles**

This section is supplemented with the following new paragraph:

At least 14-days prior to the start of production of the piling, the Contractor shall advise the Engineer of the production schedule. The Contractor shall give the Inspector safe and free access to the Work. If the Inspector observes any nonspecification Work or unacceptable quality control practices, the Inspector will advise the plant manager. If the corrective action is not acceptable to the Engineer, the piling(s) will be subject to rejection by the Engineer.

1 **6-05.3(9)A Pile Driving Equipment Approval**

2 The first sentence of the second paragraph is revised to read:

3  
4 The Contractor shall submit Type 2E Working Drawings consisting of a wave equation  
5 analysis for all pile driving systems used to drive piling with required maximum driving  
6 resistances of greater than 300 tons.  
7

8 6-07.AP6

9 **Section 6-07, Painting**

10 **August 7, 2017**

11 **6-07.3(2) Submittals**

12 This section is revised to read:

13  
14 The Contractor shall submit a painting plan consisting of one comprehensive submittal  
15 including all components described in this Section. The Contractor shall submit Type 2  
16 Working Drawings of the painting plan components.  
17

18 For shop application of paint, the painting plan shall include the documents and  
19 samples listed in Sections 6-07.3(2)B, 6-07.3(2)C, and 6-07.3(2)E.  
20

21 For field application of paint, the painting plan shall include the documents and  
22 samples listed in Section 6-07.3(2)A through 6-07.3(2)F.  
23

24 **6-07.3(2)A Work Force Qualifications Submittal Component**

25 Item number 2 is revised to read:

- 26  
27 2. Résumé of qualifications and contact information for the Contractor's on-site  
28 supervisors. Each on-site supervisor shall have 3 years' minimum of industrial  
29 painting field experience with 1 year minimum of field supervisory or management  
30 experience in bridge painting projects.  
31

32 **6-07.3(2)D Hazardous Waste Containment, Collection, Testing, and Disposal**  
33 **Submittal Component**

34 This section is revised to read:

35  
36 The hazardous waste containment, collection, testing, and disposal submittal  
37 component of the painting plan shall include the following:  
38

- 39 1. Abrasive blasting containment system attachment and support in accordance  
40 with Section 6-07.3(10)A, with a complete description of each attachment  
41 device.  
42  
43 2. Details of jobsite material storage facilities and containment waste storage  
44 facilities, including location, security, and environmental control.  
45  
46 3. Methods and materials used to contain, collect, and dispose of all  
47 containment waste and all construction-related waste, including transportation  
48 of waste.  
49

4. Details of the containment waste sampling plan conforming to WAC 173-303 for waste designated as dangerous waste or extremely hazardous waste.
5. The name of, and contact information for, the accredited analytical laboratory performing the testing of the containment waste samples in accordance with Section 6-07.3(10)F.
6. Process for tracking the disposal of hazardous waste, including a sample form of the tracking documentation.
7. When a wind speed threshold is specified, a description of the method to lower or withdraw tarps, plastic exterior, and other containment components presenting an exposed face to wind, and the estimated time required to accomplish this action.
8. Provisions for dust and debris collection, ventilation, and auxiliary lighting within the containment system.

#### **6-07.3(2)E Cleaning and Surface Preparation Equipment Submittal Component**

This section, including title, is revised to read:

##### **6-07.3(2)E Cleaning and Surface Preparation Submittal Component**

The cleaning and surface preparation submittal component of the painting plan shall include the following:

1. Details of the abrasive blast cleaning operation, including:
  - a. Description of the abrasive blast cleaning procedure.
  - b. Type, manufacturer, and brand of abrasive blast material and all associated additives, including Materials Safety Data Sheets (MSDS).
  - c. Description of the abrasive blast cleaning equipment to be used.

#### **6-07.3(3)A Quality Control and Quality Assurance for Shop Application of Paint**

In this section, “approved” is revised to read “accepted”.

#### **6-07.3(3)B Quality Control and Quality Assurance for Field Application of Paint**

The first sentence of the first paragraph is revised to read:

For field application of paint, the Contractor shall conduct quality control inspections as required by SSPC-PA 1, using the personnel and the processes outlined in the painting plan.

The second paragraph is revised to read:

A Type 1 Working Drawing consisting of the Contractor's daily quality control report, signed and dated by the Contractor's quality control inspector, accompanied by copies of the test results of quality control tests performed on the work covered by the daily quality control report, shall be submitted before the end of the next day's work shift.

In the third paragraph, "approval" is revised to read "acceptance".

Item number 2 of the fourth paragraph is deleted.

In the fourth paragraph, items 3, 4 and 5 are renumbered to 2, 3 and 4, respectively.

#### **6-07.3(9)F Shop Surface Cleaning and Preparation**

In the first sentence, "approved" is revised to read "accepted".

#### **6-07.3(9)G Application of Shop Primer Coat**

In the first sentence of the first paragraph, "approval" is revised to read "acceptance".

The last sentence of the first paragraph is revised to read:

Primer shall be applied with the spray nozzles and pressures recommended by the manufacturer of the paint system, to attain the film thicknesses specified.

In the third paragraph, the first sentence is revised to read:

The Contractor shall provide access to the steel to permit inspection by the Engineer.

#### **6-07.3(9)I Application of Field Coatings**

The following new paragraph is inserted before to the first paragraph:

An on-site supervisor shall be present for each work shift at the bridge site.

In the fourth paragraph (after the preceding Amendment is applied), "approved" is deleted from the first sentence.

The first sentence of the last paragraph is revised to read:

All paint damage that occurs shall be repaired in accordance with the manufacturer's written recommendations.

#### **6-07.3(10)A Containment**

The first four paragraphs are deleted and replaced with the following three paragraphs:

The containment system shall be in accordance with SSPC Technology Guide No. 6, Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations Class 1. The containment system shall fully enclose the steel to be painted and not allow any material to escape the containment system. The Contractor shall protect the surrounding environment from all debris or damage resulting from the Contractor's operations.

1  
2 Except as otherwise specified in the Contract, the containment length shall not exceed  
3 the length of a span (defined as pier to pier). The containment system shall not cause  
4 any damage to the existing structure. Attachment devices shall not mark or otherwise  
5 damage the steel member to which they are attached. Field-welding of attachments to  
6 the existing structure will not be allowed. The Contractor shall not drill holes into the  
7 existing structure or through existing structural members except as shown in the  
8 Contractor's painting plan Working Drawing submittal.  
9

10 Emissions shall be assessed by Visible Emission Observations (Method A) in SSPC  
11 Technology Update No. 7 Section 6.2 and shall be limited to the Level A Acceptance  
12 Criteria Option Level 0 Emissions standard. If visible emissions occur or if failure to the  
13 containment system occurs or if signs of failure to the containment system are present,  
14 the Contractor shall stop work immediately. Work shall not resume until the failure has  
15 been corrected to the satisfaction of the Engineer.  
16

#### 17 **6-07.3(10)B Bird Guano, Fungus, and Vegetation Removal**

18 The last paragraph is revised to read:  
19

20 Bird guano, bird nesting materials, fungus, and vegetative growth shall be disposed of  
21 at a land disposal site accepted by the Engineer. The Contractor shall submit a Type 1  
22 Working Drawing consisting of a copy of the disposal receipt, which shall include a  
23 description of the disposed material.  
24

#### 25 **6-07.3(10)C Dry Cleaning**

26 This section is revised to read:  
27

28 Dry cleaning shall include removal of accumulated dirt and debris on the surfaces to be  
29 painted. Collected dirt and debris shall be disposed of at a land disposal site accepted  
30 by the Engineer. The Contractor shall submit a Type 1 Working Drawing consisting of a  
31 copy of the disposal receipt, which shall include a description of the disposed material.  
32

#### 33 **6-07.3(10)D Surface Preparation Prior to Overcoat Painting**

34 The second paragraph is revised to read:  
35

36 Following any preparation by SSPC-SP1, all steel surfaces to be painted shall be  
37 prepared in accordance with SSPC-SP 7, brush-off blast cleaning. Surfaces  
38 inaccessible to brush-off blast shall be prepared in accordance with SSPC-SP 15,  
39 commercial grade power tool cleaning, as allowed by the Engineer.  
40

41 The first sentence of the third paragraph is revised to read:  
42

43 Following brush-off blast cleaning, the Contractor shall perform spot abrasive blast  
44 cleaning in accordance with SSPC-SP 6, commercial blast cleaning.  
45

46 In the fifth sentence of the third paragraph, "approved" is revised to read "accepted".  
47

48 The second sentence of the last paragraph is deleted.  
49

1 **6-07.3(10)F Collecting, Testing, and Disposal of Containment Waste**

2 The third, fourth and fifth paragraphs are deleted and replaced with the following two new  
3 paragraphs:

4  
5 Containment waste is defined as all paint chips and debris removed from the steel  
6 surface and all abrasive blast media, as contained by the containment system. After all  
7 waste from the containment system has been collected, the Contractor shall collect  
8 representative samples of the components that field screening indicates are  
9 lead-contaminated material. The Contractor shall collect at least one representative  
10 sample from each container. The Contractor may choose to collect a composite sample  
11 of each container, but the composite sample must consist of several collection points (a  
12 minimum of 3 random samples) that are representative of the entire contents of the  
13 container and representative of the characteristics of the type of waste in the container.  
14 In accordance with WAC 173-303-040, a representative sample means "a sample  
15 which can be expected to exhibit the average properties of the sample source."  
16

17 The debris shall be tested for metals using the Toxicity Characteristics Leaching  
18 Procedure (TCLP) and EPA Methods 1311 and 6010. At a minimum, the materials  
19 should be analyzed for the Resource Conservation and Recovery Act (RCRA) 8 Metals  
20 (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). Pursuant  
21 to the Dangerous Waste (DW) Regulations Chapter 173-303-90(8)(c) WAC, "Any  
22 waste that contains contaminants which occur at concentrations at or above the DW  
23 threshold must be designated as DW." All material within each individual container or  
24 containment system that designates as DW shall be disposed of at a legally permitted  
25 Subtitle C Hazardous Waste Landfill. All material within each individual container or  
26 containment system that designate below the DW threshold, will be designated as  
27 "Solid Waste" and shall be disposed of at a legally permitted Subtitle D Landfill.  
28 Disposal shall be in accordance with WAC 173-303 for waste designated "Dangerous  
29 Waste" and pursuant to WAC 173-350 for waste designated as "Solid Waste".  
30

31 The first sentence of the fifth to last paragraph is revised to read:

32  
33 The Contractor shall submit a Type 1 Working Drawing consisting of two copies of the  
34 transmittal documents or bill of lading listing the waste material shipped from the  
35 construction site to the waste disposal site.  
36

37 **6-07.3(10)G Treatment of Pack Rust and Gaps**

38 In this section, "approved by the Engineer" is revised to read "accepted by the Engineer".  
39

40 **6-07.3(10)H Paint System**

41 In the last paragraph, "approved" is revised to read "allowed".  
42

43 **6-07.3(10)I Paint Color**

44 In the last sentence, "approved" is revised to read "allowed".  
45

46 **6-07.3(10)J Mixing and Thinning Paint**

47 In the third paragraph, "approved" is revised to read "allowed".  
48

1 **6-07.3(10)O Applying Field Coatings**

2 The following new paragraph is inserted before the first paragraph:

3  
4 An on-site supervisor shall be present for each work shift at the bridge site.

5  
6 In the sixth paragraph (after the preceding Amendment is applied), “approved” and  
7 “approval” are revised to read “accepted” and “acceptance”, respectively.

8  
9 In the seventh paragraph (after the preceding Amendment is applied), “approval” is revised  
10 to read “concurrence”.

11  
12 The second sentence of the last paragraph is revised to read:

13  
14 Any plank removal or cutting shall be done with the concurrence of the Engineer.

15  
16 **6-07.3(10)P Field Coating Repair**

17 In the second to last sentence, “approved” is revised to read “accepted”.

18  
19 The last sentence is deleted.

20  
21 **6-07.3(11)A Painting of Galvanized Surfaces**

22 In the last sentence, “approval” is revised to read “acceptance”.

23  
24 **6-07.5 Payment**

25 The following new paragraph is inserted after the paragraph following the Bid item  
26 “Cleaning and Painting - \_\_\_\_\_”, lump sum:

27  
28 When a weather station is specified, all costs in connection with furnishing, installing,  
29 operating, and removing the weather station, including furnishing mounting hardware  
30 and repeaters, accessories and wireless display console units, processing and  
31 submitting daily weather data reports, maintenance and upkeep, shall be included in  
32 the lump sum Contract price for “Cleaning And Painting – \_\_\_\_\_”.

33  
34 6-08.AP6

35 **Section 6-08, Waterproofing**  
36 **January 3, 2017**

37 This section and all subsections, including title, is revised to read:

38  
39 **6-08 Bituminous Surfacing on Structure Decks**

40 **6-08.1 Description**

41 This Work consists of removing and placing Hot Mix Asphalt (HMA) or Bituminous  
42 Surface Treatment (BST) directly on or over a Structure. This Work also includes  
43 performing concrete bridge deck repair, applying waterproofing membrane, and  
44 sealing paving joints.

45  
46 **6-08.2 Materials**

47 Materials shall meet the requirements of the following sections:

48

|                                 |        |
|---------------------------------|--------|
| 49 Bituminous Surface Treatment | 5-02.2 |
| 50 Hot Mix Asphalt              | 5-04.2 |
| 51 Joint Sealants               | 9-04.2 |



|                                    |            |
|------------------------------------|------------|
| Closed Cell Foam Backer Rod        | 9-04.2(3)A |
| Waterproofing Membrane (Deck Seal) | 9-11       |
| Bridge Deck Repair Material        | 9-20.5     |

## 6-08.3 Construction Requirements

### 6-08.3(1) Definitions

**Adjusted Removal Depth** – the Bituminous Pavement removal depth specified by the Engineer to supersede the Design Removal Depth after review of the Contractor survey of the existing Bituminous Pavement grade profile.

**Bituminous Pavement** – the surfacing material containing an asphalt binder.

**Design Removal Depth** – the value shown in the "pavement schedule" or elsewhere in the Plans to indicate the design thickness of Bituminous Pavement to be removed.

**Final Grade Profile** – the compacted finished grade surface of completed Bituminous Pavement surfacing consisting of a vertical profile and superelevation cross-slope, developed by the Engineer for Grade Controlled Structure Decks based on the Contractor survey.

**Grade Controlled** – a Structure Deck requiring restriction of Bituminous Pavement work, including restriction of pavement removal methods and restriction of overlay pavement thicknesses.

**Structure Deck** – the bridge deck (concrete or timber), bridge approach slab, top of concrete box culvert, or other concrete surfaces over or upon which existing Bituminous Pavement is removed and new Bituminous Pavement is applied.

### 6-08.3(2) Contractor Survey for Grade Controlled Structure Decks

Prior to removing existing Bituminous Pavement from a Grade Controlled Structure Deck, the Contractor shall complete a survey of the existing surface for use in establishing the existing cross section and grade profile elevations. When removal of Bituminous Pavement is to be achieved by rotary milling/planing, the Contractor's survey shall also include the depths of the existing surfacing at each survey point.

The Contractor is responsible for all calculations, surveying, installation of control points, and measuring required for setting, maintaining and resetting equipment and materials necessary for the construction of the overlay to the Final Grade Profile.

#### 6-08.3(2)A Survey Requirements

The Contractor shall establish at least two primary survey control points for controlling actual Bituminous Pavement removal depth and the Final Grade Profile. Horizontal control shall be by station and offset which shall be tied to either the Roadway centerline or the Structure centerline. Vertical control may be an assumed datum established by the Contractor.

Primary control points shall be described by station or milepost and offset on the baseline selected by the Contractor. The Contractor may expand the survey control information to include secondary horizontal and vertical control points as needed for the project.

Survey information collected shall include station or milepost, offset, and elevation for each lane line and curb line. Survey information shall be collected at even 20 foot station intervals, and along the centerline of each bridge expansion joint. The survey shall extend 300'-0" beyond the bridge back of pavement seat or end of Structure Deck. The survey information shall include the top of Bituminous Pavement elevation and, when rotary milling/planing equipment is used, the corresponding depth of Bituminous Pavement to the Structure Deck. The Contractor shall ensure a surveying accuracy to within  $\pm 0.01$  feet for vertical control and  $\pm 0.2$  feet for horizontal control.

Voids in HMA created by the Contractor's Bituminous Pavement depth measurements shall be filled by material conforming to Section 9-20 or another material acceptable to the Engineer.

#### **6-08.3(2)B Survey Submittal**

The Contractor's survey records shall include descriptions of all survey control points including station/milepost, offset, and elevations of all secondary control points. The Contractor shall maintain survey records of sufficient detail to allow the survey to be reproduced. The Contractor shall submit a Type 2 Working Drawing consisting of the compiled survey records and information. Survey data shall be submitted as an electronic file in Microsoft Excel format.

#### **6-08.3(2)C Final Grade Profile and Adjusted Removal Depth**

Based on the results of the survey, the Engineer may develop a Final Grade Profile and Adjusted Removal Depth. If they are developed, the Final Grade Profile and Adjusted Removal Depth will be provided to the Contractor within three working days after receiving the Contractor's survey information. When provided, the Adjusted Removal Depth supersedes the Design Removal Depth to become the Bituminous Pavement removal depth for that Structure Deck.

#### **6-08.3(3) General Bituminous Pavement Removal Requirements**

The Contractor shall remove Bituminous Pavement and associated deck repair material from Structure Decks to the horizontal limits shown in the Plans and to either the specified or adjusted Bituminous Pavement removal depth as applicable.

Removal of Bituminous Pavement within 12-inches of existing permanent features that limit the reach of the machine or the edge of the following items shall be by hand or by hand operated (nominal 30-pounds class) power tools: existing bridge expansion joint headers; steel expansion joint assemblies; concrete butt joints between back of pavement seats and bridge approach slabs, bridge drain assemblies; three beam post steel anchorage assemblies fastened to the side or top of the Structure Deck.

When removing Bituminous Pavement with a planer, Section 5-04.3(14) shall apply. If the planer contacts the Structure Deck in excess of the specified planing depth tolerance, or contacts steel reinforcing bars at any time, the Contractor shall immediately cease planing operations and notify the Engineer. Planing operations shall not resume until completion of the appropriate adjustments to the planing machine and receiving the Engineer's concurrence to resume.

**6-08.3(4) Partial Depth Removal of Bituminous Pavement from Structure Decks**

The depth of surfacing removal, as measured to the bottom of the lowest milling groove generated by the rotary milling/planing machine shall be +0.01, -0.02-feet of the specified or Adjusted Removal Depth as applicable.

**6-08.3(5) Full Depth Removal of Bituminous Pavement from Structure Decks**

**6-08.3(5)A Method of Removal**

The Contractor shall perform full depth removal by a method that does not damage or remove the Structure Deck in excess of the specified Bituminous Pavement removal tolerance. The Contractor shall submit a Type 2 Working Drawing consisting of the proposed methods and equipment to be used for full depth removal.

**6-08.3(5)B Planer Requirements for Full Depth Removal**

The final planed surface shall have a finished surface with a tolerance of +0.01, -0.02 feet within the planed surface profile, as measured from a 10-foot straight edge. Multiple passes of planing to achieve smoothness will not be allowed.

In addition to Section 6-08.3(3), the planing equipment shall conform to the following additional requirements:

1. The cutting tooth spacing on the rotary milling head shall be less than or equal to 1/4 inch.
2. The rotary milling/planing machine shall have cutting teeth that leave a uniform plane surface at all times. All teeth on the mill head shall be kept at a maximum differential tolerance of 3/8-inch between the shortest and longest tooth, as measured by a straight edge placed the full width of the rotary milling head.
3. Cutting tips shall be replaced when 30 percent of the total length of the cutting tip material remains.

Prior to each day's Bituminous Pavement removal operations, the Contractor shall confirm to the satisfaction of the Engineer that the rotary head cutting teeth are within the specified tolerances.

1                   **6-08.3(5)C Structure Deck Cleanup after Bituminous Pavement**  
2                   **Removal**

3                   Waterproofing membrane that is loose or otherwise not firmly bonded to  
4                   the Structure Deck shall be removed as an incidental component of the  
5                   Work of surfacing removal. Existing waterproofing membrane bonded to  
6                   the Structure Deck need not be removed.  
7

8                   **6-08.3(6) Repair of Damage due to Bituminous Pavement Removal**  
9                   **Operations**

10                  All concrete bridge deck, pavement seat, and steel reinforcing bar damage  
11                  due to the Contractor's surfacing removal operations shall be repaired by the  
12                  Contractor in accordance with Section 1-07.13, and as specified below.  
13

14                  Damaged concrete in excess of the specified Bituminous Pavement removal  
15                  tolerance shall be repaired in accordance with Section 6-08.3(7), with the  
16                  bridge deck repair material placed to the level of the surrounding bridge deck  
17                  and parallel to the final grade paving profile.  
18

19                  Damaged steel reinforcing bar shall be repaired as follows:  
20

- 21                   1.   Damage to steel reinforcing bar resulting in a section loss less than  
22                   20-percent of the bar with no damage to the surrounding concrete  
23                   shall be left in place and shall be repaired by removing the concrete  
24                   to a depth ¾-inches around the top steel reinforcing bar and placing  
25                   bridge deck repair material accepted by the Engineer to the level of  
26                   the bridge deck and parallel to the final grade paving profile.  
27
- 28                   2.   Damage to steel reinforcing bar resulting in a section loss of  
29                   20-percent or more in one location, bars partially or completely  
30                   removed from the bridge deck, or where there is a lack of bond to  
31                   the concrete, shall be repaired by removing the adjacent concrete  
32                   and splicing a new bar of the same size. Concrete shall be removed  
33                   to provide a ¾-inch minimum clearance around the bars. The splice  
34                   bars shall extend a minimum of 40 bar diameters beyond each end  
35                   of the damage.  
36

37                   **6-08.3(7) Concrete Deck Repair**

38                   This Work consists of repairing the concrete deck after Bituminous Pavement  
39                   has been removed.  
40

41                   **6-08.3(7)A Concrete Deck Preparation**

42                   The Contractor, with the Engineer, shall inspect the exposed concrete  
43                   deck to establish the extent of bridge deck repair in accordance with  
44                   Section 6-09.3(6), except item 4 in Section 6-09.3(6) does not apply.  
45                   Areas of Structure Deck left with existing well bonded waterproof  
46                   membrane after full depth Bituminous Pavement removal are exempt  
47                   from this inspection requirement.  
48

49                   All loose and unsound concrete within the repair area shall be removed  
50                   with jackhammers or chipping hammers no more forceful than the  
51                   nominal 30 pounds class, or other mechanical means acceptable to the

Engineer, and operated at angles less than 45 degrees as measured from the surface of the deck to the tool. If unsound concrete exists around the existing steel reinforcing bars, or if the bond between concrete and steel reinforcing bar is broken, the Contractor shall remove the concrete to provide a ¾ inch minimum clearance to the bar. The Contractor shall take care to prevent damage to the existing steel reinforcing bars and concrete to remain.

After removing sufficient concrete to establish the limits of the repair area, the Contractor shall make ¾ inch deep vertical saw cuts and maintain square edges at the boundaries of the repair area. The exposed steel reinforcing bars and concrete in the repair area shall be abrasive blasted and blown clean just prior to placing the bridge deck repair material.

#### **6-08.3(7)B Ultra-Low Viscosity, Two-Part Liquid, Polyurethane-Hybrid Polymer Concrete**

The ultra-low viscosity, two-part liquid, polyurethane-hybrid polymer concrete shall be mixed in accordance with the manufacturer's recommendations.

Aggregate shall conform to the gradation limit requirements recommended by the manufacturer. The aggregate and the ultra-low viscosity, two-part liquid, polyurethane-hybrid polymer concrete shall be applied to the repair areas in accordance with the sequence and procedure recommended by the manufacturer.

All repairs shall be float finished flush with the surrounding surface within a tolerance of 1/8 inch of a straight edge placed across the full width and breadth of the repair area.

#### **6-08.3(7)C Pre-Packaged Cement Based Repair Mortar**

The Contractor shall mix the pre-packaged cement based repair mortar using equipment, materials and proportions, batch sizes, and process as recommended by the manufacturer.

All repairs shall be float finished flush with the surrounding surface within a tolerance of 1/8 inch of a straight edge placed across the full width and breadth of the repair area.

#### **6-08.3(7)D Cure**

All bridge deck repair areas shall be cured in accordance with the manufacturer's recommendations and attain a minimum compressive strength of 2,500 psi before allowing vehicular and foot traffic on the repair and placing waterproofing membrane on the bridge deck over the repair.

#### **6-08.3(8) Waterproof Membrane for Structure Decks**

This work consists of furnishing and placing a waterproof sheet membrane system over a prepared Structure Deck prior to placing an HMA overlay. The waterproof membrane system shall consist of a sheet membrane adhered to the Structure Deck with a primer.

The Contractor shall comply with all membrane manufacturer's installation recommendations.

**6-08.3(8)A Structure Deck Preparation**

The Structure Deck and ambient air temperatures shall be above 50°F and the Structure Deck shall be surface-dry at the time of the application of the primer and membrane.

All areas of a Structure Deck that have fresh cast bridge deck concrete less than 28 days old (not including bridge deck repair concrete placed in accordance with Section 6-08.3(7)) shall cure for a period of time recommended by the membrane manufacturer, or as specified by the Engineer, before application of the membrane.

The entire Structure Deck and the sides of the curb and expansion joint headers to the height of the HMA overlay shall be free of all foreign material such as dirt, grease, etc. Prior to applying the primer or sheet membrane, all dust and loose material shall be removed from the Structure Deck with compressed air. All surface defects such as spalled areas, cracks, protrusions, holes, sharp edges, ridges, etc., and other surface imperfections greater than ¼ inch in width shall be corrected prior to application of the membrane.

**6-08.3(8)B Applying Primer**

The primer shall be applied to the cleaned deck surfaces at the rate according to the procedure recommended by the membrane manufacturer. All surfaces to be covered by the membrane shall be thoroughly and uniformly coated with primer. Structure Deck areas left with existing well bonded waterproof membrane after bituminous surfacing removal shall receive an application of primer in accordance with the membrane manufacturer's recommendations. Precautionary measures shall be taken to ensure that pools and thick layers of primer are not left on the deck surface. The membrane shall not be applied until the primer has cured or volatile material has substantially dissipated, in accordance with the membrane manufacturer's recommendations.

The primer and waterproof membrane shall extend from the bridge deck up onto the curb face and expansion joint header face the thickness of the HMA overlay. The membrane shall adhere to the vertical surface.

**6-08.3(8)C Placing Waterproof Membrane**

Membrane application shall begin at the low point on the deck, and continue in a lapped shingle pattern. The overlap shall be a minimum of six inches or greater if recommended by the membrane manufacturer. Membrane seams shall be sealed as recommended by the membrane manufacturer. Hand rollers or similar tools shall be used on the applied membrane to assure firm and uniform contact with the primed Structure surfaces.

1 The fabric shall be neatly cut and contoured at all expansion joints and  
2 drains. The cuts at bridge drains shall be two right angle cuts made to the  
3 inside diameter of the bridge deck drain outlet, after which the corners of  
4 the waterproof membrane shall be turned down into the drains and laid in  
5 a coating of primer.

#### 6-08.3(8)D Membrane Repair and Protection

6  
7  
8 The waterproof membrane will be visually inspected by the Engineer for  
9 uniformity, tears, punctures, bonding, bubbles, wrinkles, voids and other  
10 defects. All such deficiencies shall be repaired in accordance with the  
11 membrane manufacturer's recommendations prior to placement of the  
12 HMA overlay.

13  
14 The membrane material shall be protected from damage due to the  
15 paving operations in accordance with the membrane manufacturer's  
16 recommendations. No traffic or equipment except that required for the  
17 actual waterproofing and paving operations will be permitted to travel or  
18 rest on the membrane until it is covered by the HMA overlay. The use of  
19 windrows is not allowed for laydown of HMA on a membrane.

20  
21 Where waterproofing membrane is placed in stages or applied at different  
22 times, a strip of temporary paper shall be used to protect the membrane  
23 overlap from the HMA hand removal methods.

#### 6-08.3(9) Placing Bituminous Pavement on Structure Decks

24  
25 HMA overlay shall be applied on Grade Controlled Structure Decks using  
26 reference lines for vertical control in accordance with Section 5-04.3(3)C.

27  
28 The compacted elevation of the HMA overlay on Structure Decks shall be  
29 within  $\pm 0.02$  feet of the specified overlay thickness or Final Grade Profile as  
30 applicable. Deviations from the final grade paving profile in excess of the  
31 specified tolerance and areas of non-conforming surface smoothness shall be  
32 corrected in accordance with Section 5-04.3(13).

33  
34 Final grade Roadway transitions to a Structure Deck with Bituminous  
35 Pavement shall not exceed a 0.20 percent change in grade in accordance  
36 with the bridge deck transition for HMA overlay Standard Plan, unless shown  
37 otherwise in the Plans.

38  
39 Final grade compacted HMA elevations shall be higher than an adjacent  
40 concrete edge by  $\frac{1}{4}$  inch  $\pm \frac{1}{8}$  inch at all expansion joint headers and concrete  
41 butt joints as shown in the concrete to asphalt butt joint details of the bridge  
42 paving joint seals Standard Plan. This also applies to steel edges within the  
43 limits of the overlay such as bridge drain frames and steel joint riser bars at  
44 bridge expansion joints.

#### 6-08.3(9)A Protection of Structure Attachments and Embedments

45  
46  
47 The Contractor is responsible for protecting all Structure attachments and  
48 embedments from the application of BST and HMA.  
49  
50

1 Drainage inlets that are to remain open, and expansion joints, shall be  
2 cleaned out immediately after paving is completed. Materials passing  
3 through expansion joints shall be removed from the bridge within  
4 10 working days.

5  
6 All costs incurred by the Contractor in protective measures and clean up  
7 shall be included in the unit Contract prices for the associated Bid items  
8 of Work.

9  
10 **6-08.3(10) HMA Compaction on Structure Decks**

11 Compaction of HMA on Structure Decks shall be in accordance with  
12 Section 5-04.3(10).

13  
14 Work rejected in accordance with Section 5-04.3(11) shall include the  
15 materials, work, and incidentals to repair an existing waterproof membrane  
16 damaged by the removal of the rejected work.

17  
18 **6-08.3(11) Paved Panel Joint Seals and HMA Sawcut and Seal**

19 Bridge paving joint seals shall be installed in accordance with  
20 Section 5-04.3(12)B and the details shown in the Plans and Standard Plans.

21  
22 When concrete joints are exposed after removal of Bituminous Pavement, the  
23 joints shall be cleaned and sealed in accordance with Section 5-01.3(8) and  
24 the paved panel joint seal details of the bridge paving joint seals Standard  
25 Plan, including placement of the closed cell backer rod at the base of the  
26 cleaned joint. If waterproofing membrane is required, the membrane shall be  
27 slack or folded at the concrete joint to allow for Structure movements without  
28 stress to the membrane. After placement of the HMA overlay, the second  
29 phase of the paved panel joint seal shall be completed by sawing the HMA  
30 and sealing the sawn joint in accordance with Section 5-04.3(12)B2.

31  
32 **6-08.4 Measurement**

33 Removing existing Bituminous Pavement from Structure Decks will be measured  
34 by the square yard of Structure Deck surface area with removed overlay.

35  
36 Bridge deck repair will be measured by the square foot surface area of deck  
37 concrete removed with the measurement taken at the plane of the top mat of steel  
38 reinforcing bars.

39  
40 Waterproof membrane will be measured by the square yard surface area of  
41 Structure Deck and curb and header surface area covered by membrane.

42  
43 **6-08.5 Payment**

44 Payment will be made for each of the following Bid items when they are included in  
45 the Proposal:

46  
47 "Structure Surveying", lump sum.

48  
49 "Removing Existing Overlay From Bridge Deck\_\_\_\_", per square yard.  
50 The unit Contract price per square yard for "Removing Existing Overlay From  
51 Bridge Deck\_\_\_\_", shall be full pay for performing the Work as specified for full



removal of Bituminous Pavement on Structure Decks, including the removal of existing waterproof membrane and disposing of materials.

"Bridge Deck Repair Br. No.\_\_\_\_", per square foot.

The unit Contract price per square foot for "Bridge Deck Repair Br. No.\_\_\_\_" shall be full pay for performing the Work as specified, including removing and disposing of the concrete within the repair area and furnishing, placing, finishing, and curing the repair concrete.

"Waterproof Membrane Br. No.\_\_\_\_", per square yard.

The unit Contract price per square yard for "Waterproof Membrane Br. No.\_\_\_\_" shall be full pay for performing the Work as specified, including repairing any damaged or defective waterproofing membrane and repair of damaged HMA overlay.

6-09.AP6

## **Section 6-09, Modified Concrete Overlays**

**April 4, 2016**

### **6-09.3(8)A Quality Assurance for Microsilica Modified and Fly Ash Modified Concrete Overlays**

The first sentence of the first paragraph is revised to read the following two new sentences:

The Engineer will perform slump, temperature, and entrained air tests for acceptance in accordance with Section 6-02.3(5)D and as specified in this Section after the Contractor has turned over the concrete for acceptance testing. Concrete samples for testing shall be supplied to the Engineer in accordance with Section 6-02.3(5)E.

The last paragraph is deleted.

### **6-09.3(8)B Quality Assurance for Latex Modified Concrete Overlays**

The first two paragraphs are deleted and replaced with the following:

The Engineer will perform slump, temperature, and entrained air tests for acceptance in accordance with Section 6-02.3(5)D and as specified in this Section after the Contractor has turned over the concrete for acceptance testing. The Engineer will perform testing as the concrete is being placed. Samples shall be taken on the first charge through each mobile mixer and every other charge thereafter. The sample shall be taken after the first 2 minutes of continuous mixer operation. Concrete samples for testing shall be supplied to the Engineer in accordance with Section 6-02.3(5)E.

The second to last sentence of the last paragraph is revised to read:

Recommendations made by the technical representative on or off the jobsite shall be adhered to by the Contractor.

6-10.AP6

## **Section 6-10, Concrete Barrier**

**August 7, 2017**

### **6-10.3(5) Temporary Concrete Barrier**

This section title is revised to read:

#### **Temporary Barrier**

The first paragraph is revised to read:

For temporary barrier, the Contractor may use precast concrete barrier or temporary steel barrier. Temporary concrete barrier shall comply with Standard Plan requirements and cross-sectional dimensions, except that: (1) it may be made in other lengths than those shown in the Standard Plan, and (2) it may have permanent lifting holes no larger than 4 inches in diameter or lifting loops. Temporary steel barrier shall be certified that it meets the requirements of NCHRP 350 or MASH Test Level 3 or 4 and shall be installed in accordance with the manufacturer's recommendations.

### **6-10.4 Measurement**

The first sentence of the second paragraph is revised to read:

Temporary barrier will be measured by the linear foot along the completed line and slope of the barrier, one time only for each setup of barrier protected area.

### **6-10.5 Payment**

The Bid item "Temporary Conc. Barrier", per linear foot, and the paragraph following this Bid item, is revised to read:

"Temporary Barrier", per linear foot.

The unit Contract price per linear foot for "Temporary Barrier" shall be full pay for all costs, including furnishing, installing, connecting, anchoring, maintaining, temporary storage, and final removal of the temporary barrier.

6-12.AP6

## **Section 6-12, Noise Barrier Walls**

**January 3, 2017**

### **6-12.3(9) Access Doors and Concrete Landing Pads**

The first sentence of the last paragraph is revised to read:

The Contractor shall construct concrete landing pads for each access door location as shown in the Plans.

### **6-12.5 Payment**

In the paragraph following the bid item "Noise Barrier Wall Access Door", per each, "concrete landing pad" is revised to read "concrete landing pads".

6-14.AP6

## **Section 6-14, Geosynthetic Retaining Walls**

**January 3, 2017**

### **6-14.3(2) Submittals**

The first sentence of the first paragraph is revised to read:

The Contractor shall submit Type 2E Working Drawings consisting of detailed plans for each wall.

### **6-14.5 Payment**

The bid item "Concrete Fascia Panel", per square foot, and the paragraph following this bid item are revised to read:

"Concrete Fascia Panel For Geosynthetic Wall", per square foot.

All costs in connection with constructing the concrete fascia panels as specified shall be included in the unit Contract price per square foot for "Concrete Fascia Panel For Geosynthetic Wall", including all steel reinforcing bars, premolded joint filler, polyethylene bond breaker strip, joint sealant, PVC pipe for weep holes, exterior surface finish, and pigmented sealer (when specified), constructing and placing the concrete footing, edge beam, anchor beam, anchor rod assembly, and backfill.

6-19.AP6

## **Section 6-19, Shafts**

**January 3, 2017**

### **6-19.3 Construction Requirements**

This section is supplemented with the following new subsection:

#### **6-19.3(10) Engineer's Final Acceptance of Shafts**

The Engineer will determine final acceptance of each shaft, based on the nondestructive QA test results and analysis for the tested shafts, and will provide a response to the Contractor within 3 working days after receiving the test results and analysis submittal.

### **6-19.3(1)B Nondestructive Testing of Shafts**

This section's content is deleted and replaced with the following new subsections:

#### **6-19.3(1)B1 Nondestructive Quality Assurance (QA) Testing of Shafts**

Unless otherwise specified in the Special Provisions, the Contractor shall perform nondestructive QA testing of shafts, except for those constructed completely in the dry. Either crosshole sonic log (CSL) testing in accordance with ASTM D 6760 or thermal integrity profiling (TIP) testing in accordance with ASTM D 7949 shall be used.

#### **6-19.3(1)B2 Nondestructive Quality Verification (QV) Testing of Shafts**

The Contracting Agency may perform QV nondestructive testing of shafts that have been QA tested by the Contractor. The Contracting Agency may test up to ten percent of the shafts. The Engineer will identify the shafts selected for QV testing and the testing method the Contracting Agency will use.

The Contractor shall accommodate the Contracting Agency's nondestructive testing.

#### **6-19.3(2) Shaft Construction Submittal**

This section is revised to read:

The shaft construction submittal shall be comprised of the following four components: construction experience; shaft installation narrative; shaft slurry technical assistance; and nondestructive QA testing personnel. The submittals shall be Type 2 Working Drawings, except the shaft slurry technical assistance and nondestructive QA testing personnel submittals shall be Type 1.

This section is supplemented with the following new subsection:

#### **6-19.3(2)D Nondestructive QA Testing Organization and Personnel**

The Contractor shall submit the names of the testing organizations, and the names of the personnel who will conduct nondestructive QA testing of shafts. The submittal shall include documentation that the qualifications specified below are satisfied. For TIP testing, the testing organization is the group that performs the data analysis and produces the final report. The testing organizations and the testing personnel shall meet the following minimum qualifications:

1. The testing organization shall have performed nondestructive tests on a minimum of three deep foundation projects in the last two years.
2. Personnel conducting the tests for the testing organization shall have a minimum of one year experience in nondestructive testing and interpretation.
3. The experience requirements for the organization and personnel shall be consistent with the testing methods the Contractor has selected for nondestructive testing of shafts.
4. Personnel preparing test reports shall be a Professional Engineers, licensed under Title 18 RCW, State of Washington, and in accordance with WAC 196-23-020.

#### **6-19.3(3) Shaft Excavation**

The second paragraph is revised to read:

Shaft excavation shall not be started until the Contractor has received the Engineer's acceptance for the reinforcing steel centralizers required when the casing is to be pulled during concrete placement.

This section is supplemented with the following:

Except as otherwise noted, the Contractor shall not commence subsequent shaft excavations until receiving the Engineer's acceptance of the first shaft, based on the results and analysis of the nondestructive testing for the first shaft. The Contractor may commence subsequent shaft excavations prior to receiving the Engineer's acceptance of the first shaft, provided the following condition is satisfied:

The Engineer permits continuing with shaft construction based on the Engineer's observations of the construction of the first shaft, including, but not limited to, conformance to the shaft installation narrative in accordance with Section 6-19.3(2)B, and the Engineer's review of Contractor's daily reports and Inspector's daily logs concerning excavation, steel reinforcing bar placement, and concrete placement.

#### **6-19.3(5)B Steel Reinforcing Bar Cage Centralizers**

This section is supplemented with the following new sentence:

The Contractor shall furnish and install additional centralizers as required to maintain the specified concrete cover throughout the length of the shaft.

#### **6-19.3(5)C Concrete Cover Over Steel Reinforcing Bars**

In the table, the second column (including heading) is revised to read:

| <b>Minimum Concrete Cover, and<br/>Concrete Cover Tolerance, Except at<br/>Permanent Slip Casing (Inches)</b> |
|---------------------------------------------------------------------------------------------------------------|
| 3, -1½                                                                                                        |
| 4, -2                                                                                                         |
| 4, -2                                                                                                         |
| 6, -3                                                                                                         |

The following new paragraph is inserted after the table:

The concrete cover tolerances specified above apply to the concrete cover specified in the Plans, even if it exceeds the minimum concrete cover.

#### **6-19.3(6) Access Tubes for Crosshole Sonic Log (CSL) Testing**

This section title is revised to read:

##### **6-19.3(6) Contractor Furnished Accessories for Nondestructive QA Testing**

This section is supplemented with the following three new subsections:

##### **6-19.3(6)D Shafts Requiring Thermal Wire**

The Contractor shall furnish and install thermal wire in all shafts receiving the thermal wire method of TIP testing, except as otherwise noted in Section 6-19.3(1)B1.

##### **6-19.3(6)E Thermal Wire and Thermal Access Points (TAPs)**

The thermal wire and associated couplers shall be obtained from the source specified in the Special Provisions.

The Contractor shall securely attach the thermal wire to the interior of the reinforcement cage of the shaft in conformance with the supplier's instructions. At a minimum, one thermal wire shall be furnished and installed for each foot of shaft diameter, rounded to the nearest whole number, as shown in the Plans. The number of thermal wires for shaft diameters specified as "X feet 6 inches" shall be rounded up to the next higher whole number. The thermal wires shall be placed around the shaft,

inside the spiral or hoop reinforcement, and tied to the vertical reinforcement with plastic "zip" ties at a maximum spacing of 2-feet. Steel tie wire shall not be used.

The thermal wire shall be installed in straight alignment and taut, but with enough slack to not be damaged during reinforcing cage lofting. The wires shall be as near to parallel to the vertical axis of the reinforcement cage as possible. The thermal wire shall extend from the bottom of the reinforcement cage to the top of the shaft, with 15-feet of slack wire provided above the top of shaft. Care shall be taken to prevent damaging the thermal wires during reinforcement cage installation and concrete placement operations in the shaft excavation.

After completing shaft reinforcement cage fabrication at the site and prior to installation of the cage into the shaft excavation, the Contractor shall install and connect thermal access points (TAPs) to the thermal wires. The TAPs shall record data for at least one hour after the cage is placed in the excavation to measure the slurry temperature and enable the steel and slurry temperatures to equilibrate prior to placing concrete in the shaft. The TAPs shall record and store data every 15 minutes. The TAPs shall remain active for a minimum of 36 hours.

Prior to beginning concrete placement the TAPs shall be checked to ensure they are recording data and that the wires have not been damaged. If a TAP unit is not functioning due to a damaged wire, the Contractor shall repair or replace the wire. If a TAP unit fails or a wire breaks after concrete placement has started, the Contractor shall not stop the concrete placement operation to repair the wire.

#### **6-19.3(6)F Use of Access Tubes for TIP Testing Under the Thermal Probe Method**

The Contractor may use access tubes for TIP testing under the thermal probe method. Access tubes shall be cared for in accordance with Section 6-19.3(6)C. Prior to TIP testing under the thermal probe method, the water in each tube shall be removed, collected, and stored in an insulated container. The access tube shall be blown dry and swabbed to remove residual water. After TIP testing, the collected and stored tube water shall be introduced back into the access tube. New potable water may be used, provided the water temperature is not more than 10°F cooler than the average concrete temperature measured by the probe.

#### **6-19.3(6)A Shafts Requiring CSL Access Tubes**

This section, including title, is revised to read:

##### **6-19.3(6)A Shafts Requiring Access Tubes**

The Contractor shall furnish and install access tubes in all shafts receiving CSL testing or the thermal probe method of TIP testing, except as otherwise noted in Section 6-19.3(1)B1.

#### **6-19.3(6)B Orientation and Assembly of the CSL Access Tubes**

This section's title is revised to read:

##### **6-19.3(6)B Orientation and Assembly of the Access Tubes**

1 **6-19.3(6)C Care for CSL Access Tubes from Erection through CSL Testing**

2 This section's title is revised to read:

3  
4 **6-19.3(6)C Care for Access Tubes from Erection Through Nondestructive QA**  
5 **Testing**

6  
7 The second sentence is revised to read:

8  
9 The Contractor shall keep all of a shaft's access tubes full of water through the  
10 completion of nondestructive QA testing of that shaft.

11  
12 **6-19.3(7)A Concrete Class for Shaft Concrete**

13 This section is revised to read:

14  
15 Shaft concrete shall be Class 5000P conforming to Section 6-02.

16  
17 **6-19.3(7)B Concrete Placement Requirements**

18 The last sentence of the last paragraph is revised to read:

19  
20 The Section 6-02.3(6) restriction for 5 feet maximum free fall shall not apply to  
21 placement of concrete into a shaft.

22  
23 **6-19.3(7)I Requirements for Placing Concrete Above the Top of Shaft**

24 This section is revised to read:

25  
26 Concrete shall not be placed above the top of shaft (for column splice zones, columns,  
27 footings, or shaft caps) until the Contractor receives the Engineer's acceptance of  
28 nondestructive QA testing, if performed at that shaft, and acceptance of the shaft.

29  
30 **6-19.3(9) Nondestructive Testing of Shafts (Crosshole Sonic Log (CSL)**  
31 **Testing)**

32 This section, including title, is revised to read:

33  
34 **6-19.3(9) Nondestructive QA Testing of Shafts**

35 The Contractor shall provide nondestructive QA testing and analysis on all shafts with  
36 access tubes or thermal wires and TAPs facilitating the testing (See  
37 Section 6-19.3(1)B). The testing and analysis shall be performed by the testing  
38 organizations identified by the Contractor's submittal in accordance with  
39 Section 6-19.3(2)D.

40  
41 The Engineer may direct that additional testing be performed at a shaft if anomalies or  
42 a soft bottom are detected by the Contractor's testing. If additional testing at a shaft  
43 confirms the presence of a defect(s) in the shaft, the testing costs and the delay costs  
44 resulting from the additional testing shall be borne by the Contractor in accordance with  
45 Section 1-05.6. If the additional testing indicates that the shaft has no defect, the  
46 testing costs and the delay costs resulting from the additional testing will be paid by the  
47 Contracting Agency in accordance with Section 1-05.6, and, if the shaft construction is  
48 on the critical path of the Contractor's schedule, a time extension equal to the delay  
49 created by the additional testing will be granted in accordance with Section 1-08.8.

1 **6-19.3(9)A Schedule of CSL Testing**

2 This section, including title, is revised to read:

3  
4 **6-19.3(9)A TIP Testing Using Thermal Probes or CSL Testing**

5 If selected as the nondestructive QA testing method by the Contractor, TIP testing  
6 using thermal probes, or CSL testing shall be performed after the shaft concrete has  
7 cured at least 96 hours. Additional curing time prior to testing may be required if the  
8 shaft concrete contains admixtures, such as set retarding admixture or water-reducing  
9 admixture, added in accordance with Section 6-02.3(3). The additional curing time prior  
10 to testing required under these circumstances shall not be grounds for additional  
11 compensation or extension of time to the Contractor in accordance with Section 1-08.8.  
12

13 **6-19.3(9)B Inspection of CSL Access Tubes**

14 This section's title is revised to read:

15  
16 **6-19.3(9)B Inspection of Access Tubes**

17  
18 **6-19.3(9)C Engineer's Final Acceptance of Shafts**

19 This section, including title, is revised to read:

20  
21 **6-19.3(9)C TIP Testing With Thermal Wires and TAPs**

22 If selected as the nondestructive QA testing method by the Contractor, TIP testing with  
23 thermal wires and TAPs (See Section 6-19.3(6)E) shall be performed. The TIP testing  
24 shall commence at the beginning of the concrete placement operation, recording  
25 temperature readings at 15-minute intervals until the peak temperature is captured in  
26 the data. Additional curing time may be required if the shaft concrete contains  
27 admixtures, such as set retarding admixture or water-reducing admixture, added in  
28 accordance with Section 6-02.3(3). The additional curing time required under these  
29 circumstances shall not be grounds for additional compensation or extension of time to  
30 the Contractor in accordance with Section 1-08.8.  
31

32 TIP testing shall be conducted at all shafts in which thermal wires and TAPs have been  
33 installed for thermal wire analysis (Section 6-19.3(6)A).  
34

35 **6-19.3(9)D Requirements to Continue Shaft Excavation Prior to Acceptance of**  
36 **First Shaft**

37 This section, including title, is revised to read:

38  
39 **6-19.3(9)D Nondestructive QA Testing Results Submittal**

40 The Contractor shall submit the results and analysis of the nondestructive QA testing  
41 for each shaft tested. The Contractor shall submit the test results within three working  
42 days of testing. Results shall be a Type 1 Working Drawing presented in a written  
43 report.  
44

45 TIP reports shall include:

- 46  
47 1. A map or plot of the wire/tube location within the shaft and their position  
48 relative to a known and identifiable location, such as North.  
49



2. Graphical displays of temperature measurements versus depth of each wire or tube for the analysis time selected, overall average temperature with depth, shaft radius or diameter with depth, concrete cover versus cage position with depth, and effective radius.
3. The report shall identify unusual temperatures, particularly significantly cooler local deviations from the overall average.
4. The report shall identify the location and extent where satisfactory or questionable concrete is identified.
  - a. Satisfactory (S) - 0 to 6% Effective Radius Reduction and Cover Criteria Met
  - b. Questionable (Q) - Effective Local Radius Reduction > 6%, Effective Local Average Diameter Reduction > 4%, or Cover Criteria Not Met
5. Variations in temperature between wire/tubes (at each depth) which in turn correspond to variations in cage alignment.
6. Where shaft specific construction information is available (e.g. elevations of the top of shaft, bottom of casing, bottom of shaft, etc.), these values shall be noted on all pertinent graphical displays.

CSL reports shall include:

1. A map or plot of the tube location within the shaft and their position relative to a known and identifiable location, such as North.
2. Graphical displays of CSL Energy versus Depth and CSL signal arrival time versus depth or velocity versus depth.
3. The report shall identify the location and extent where good, questionable, and poor concrete is identified, where no signal was received, or where water is present.
  - a. Good (G) - No signal distortion and decrease in signal velocity of 10% or less is indicative of good quality concrete.
  - b. Questionable (Q) - Minor signal distortion and a lower signal amplitude with a decrease in signal velocity between 10% and 20%.
  - c. Poor (P) - Severe signal distortion and much lower signal amplitude with a decrease in signal velocity of 20% or more.
  - d. No Signal (NS) - No signal was received.
  - e. Water (W) - A measured signal velocity of nominally  $V = 4,800$  to  $5,000$  fps.

All QA test reports will provide a recommendation to accept the shaft as-is, recommendation for further review by the Engineer, or will provide a plan for further testing, investigation or repair to address any deficiencies identified by the testing.

#### **6-19.3(9)E Additional CSL Testing**

This section, including title, is revised to read:

#### **6-19.3(9)E Vacant**

#### **6-19.3(9)I Requirements for CSL Access Tubes and Cored Holes After CSL Testing**

This section's title is revised to read:

#### **6-19.3(9)I Requirements for Access Tubes and Cored Holes After CSL Testing**

#### **6-19.4 Measurement**

This section is revised to read:

Constructing shafts will be measured by the linear foot. The linear foot measurement will be calculated using the top of shaft elevation and the bottom of shaft elevation for each shaft as shown in the Plans.

Rock excavation for shaft, including haul, will be measured by the linear foot of shaft excavated. The linear feet measurement will be computed using the top of the rock line, defined as the highest bedrock point within the shaft diameter, and the bottom elevation shown in the Plans.

QA shaft test will be measured once per shaft tested.

#### **6-19.5 Payment**

This section is revised to read:

Payment will be made for the following Bid items when they are included in the Proposal:

"Constructing\_\_\_Diam. Shaft", per linear foot.

The unit Contract price per linear foot for "Constructing\_\_\_Diam. Shaft" shall be full pay for performing the Work as specified, including:

1. Soil excavation for shaft, including all costs in connection with furnishing, mixing, placing, maintaining, containing, collecting, and disposing of all mineral, synthetic and water slurry, and disposing of groundwater collected by the excavated shaft.
2. Furnishing and placing temporary shaft casing, including temporary casing in addition to the required casing specified in the Special Provisions, and including all costs in connection with completely removing the casing after completing shaft construction.
3. Furnishing permanent casing for shaft.

4. Placing permanent casing for shaft.
5. Casing shoring, including all costs in connection with furnishing and installing casing shoring above the specified upper limit for casing shoring but necessary to provide for sufficient water head pressure to resist artesian water pressure present in the shaft excavation, removing casing shoring, and placing seals when required.
6. Furnishing and placing steel reinforcing bar and epoxy-coated steel reinforcing bar, including furnishing and installing steel reinforcing bar centralizers.
7. Installation of CSL tubes or thermal wires.
8. Furnishing, placing and curing concrete to the top of shaft or to the construction joint at the base of the shaft-column splice zone as applicable.

Payment for "Constructing \_\_\_ Diam. Shaft" will be made upon Engineer acceptance of the shaft, including completion of satisfactory QA shaft tests as applicable.

"Rock Excavation For Shaft Including Haul", per linear foot.

When rock excavation is encountered, payment for rock excavation is in addition to the unit Contract price per linear foot for "Constructing \_\_\_ Diam. Shaft"

"Shoring Or Extra Excavation Cl. A - \_\_\_", lump sum.

The lump sum Contract price for "Shoring Or Extra Excavation Cl. A - \_\_\_" shall be full pay for performing the Work as specified, including all costs in connection with all excavation outside the limits specified for soil and rock excavation for shaft including haul, all temporary telescoping casings, and all temporary casings beyond the limits of required temporary casing specified in the Special Provisions.

"QA Shaft Test", per each.

The unit Contract price per each for "QA Shaft Test" shall be full pay for performing the Work as specified, including operating all associated accessories necessary to record and process data and develop the summary QA test reports. Section 1-04.6 does not apply to this bid item.

"Removing Shaft Obstructions", estimated.

Payment for removing, breaking-up, or pushing aside shaft obstructions, as defined in Section 6-19.3(3)E, will be made for the changes in shaft construction methods necessary to deal with the obstruction. The Contractor and the Engineer shall evaluate the effort made and reach agreement on the equipment and employees utilized, and the number of hours involved for each. Once these cost items and their duration have been agreed upon, the payment amount will be determined using the rate and markup methods specified in Section 1-09.6. For the purpose of providing a common proposal for all Bidders, the Contracting Agency has entered an amount for the item "Removing Shaft Obstructions" in the Bid Proposal to become a part of the total Bid by the Contractor.

1  
2 If drilled shaft tools, cutting teeth, casing or Kelly bar is damaged as a result of the  
3 obstruction removal work, the Contractor will be compensated for the costs to  
4 repair this equipment in accordance with Section 1-09.6.  
5

6 If shaft construction equipment is idled as a result of the Work required to deal with  
7 the obstruction and cannot be reasonably reassigned within the project, then  
8 standby payment for the idled equipment will be added to the payment  
9 calculations. If labor is idled as a result of the Work required to deal with the  
10 obstruction and cannot be reasonably reassigned within the project, then all labor  
11 costs resulting from Contractor labor agreements and established Contractor  
12 policies will be added to the payment calculations.  
13

14 The Contractor shall perform the amount of obstruction Work estimated by the  
15 Contracting Agency within the original time of the Contract. The Engineer will  
16 consider a time adjustment and additional compensation for costs related to the  
17 extended duration of the shaft construction operations, provided:  
18

- 19 1. The dollar amount estimated by the Contracting Agency has been  
20 exceeded, and  
21
- 22 2. The Contractor shows that the obstruction removal Work represents a  
23 delay to the completion of the project based on the current progress  
24 schedule provided in accordance with Section 1-08.3.  
25  
26

27 7-02.AP7

## 28 **Section 7-02, Culverts**

29 **January 3, 2017**

### 30 **7-02.2 Materials**

31 The following three new items are inserted after the item "Aggregate for Portland Cement  
32 Concrete:  
33

|                                          |            |
|------------------------------------------|------------|
| 34 Gravel Backfill for Pipe Zone Bedding | 9-03.12(3) |
| 35 Butyl Rubber Sealant                  | 9-04.11    |
| 36 External Sealing Band                 | 9-04.12    |

37  
38 The last paragraph is deleted.  
39

### 40 **7-02.3(6) Precast Reinf. Conc. Three Sided Structures, Box Culverts and Split** 41 **Box Culverts**

42 This section is supplemented with the following new paragraph:  
43

44 When the Plans include a complete set of design details for a Structure (defining panel  
45 shapes and dimensions, concrete strength requirements, and steel reinforcing bar,  
46 joint, and connection details), the design and load rating preparation and calculation  
47 submittal requirements of Sections 7-02.3(6)A1 and 7-02.3(6)A2 do not apply for the  
48 components shown in the Plans, but all other requirements of this Section remain in  
49 effect. The Contractor may propose alternate concrete culvert designs,

accommodating the same rise, span, and length as shown in the Plans, to replace the Structure details shown in the Plans. If an alternate concrete culvert design is proposed, all of the requirements of this Section, including design and load rating preparation and calculation submittal, apply.

#### **7-02.3(6)A General**

This section is supplemented with the following two new paragraphs:

Tolerances for PRCTSS shall be as follows:

1. Internal Dimensions – The internal dimension shall not vary more than 1 percent or 2 inches, whichever is less, from the Plan dimensions. The haunch dimensions shall not vary more than  $\frac{3}{4}$  inch from the Plan dimensions.
2. Slab and Wall Thickness – The slab and wall thickness shall not be less than that shown in the Plans by more than 5 percent or  $\frac{1}{2}$  inch, whichever is greater. A thickness more than that required in the Plans will not be a cause for rejection if proper joining is not affected.
3. Length of Opposite Surfaces – Variations in lengths of two opposite surfaces of the three-sided section shall not be more than  $\frac{3}{4}$  inch unless beveled sections are being used to accommodate a curve in the alignment.
4. Reinforcing steel placement shall meet the tolerances specified in Section 6-02.3(24)C.

Tolerances for PRCBC and PRCSBC shall be as follows:

1. Internal Dimensions – The internal dimensions shall not vary more than 1 percent from the Plan dimensions. If haunches are used, the haunch dimensions shall not vary more than  $\frac{1}{4}$  inch from the Plan dimensions.
2. Slab and Wall Thickness – The slab and wall thickness shall not be less than that shown in the Plans by more than 5 percent or  $\frac{3}{16}$  inch, whichever is greater. A thickness more than that required in the Plans will not be a cause for rejection.
3. Length of Opposite Box Segments – Variations in lengths of two opposite surfaces of the box segments shall not be more than  $\frac{1}{8}$  inch per foot of internal span, with a maximum of  $\frac{5}{8}$  inch for all sizes through 7 feet internal span, and a maximum of  $\frac{3}{4}$  inch for internal spans greater than 7 feet, except where beveled sections are being used to accommodate a curve in the alignment.
4. Length of Box Segments – The underrun in length of a segment shall not be more than  $\frac{1}{8}$  inch per foot of length with a maximum of  $\frac{1}{2}$  inch in any box segment.
5. Length of Legs and Slabs – The variation in length of the legs shall not be more than  $\frac{1}{8}$  inch per foot of the rise of the leg per leg with a maximum of

$\frac{5}{8}$  inches. The differential length between opposing legs of the same segment shall not be more than  $\frac{1}{2}$  inch. Length of independent top slab spans shall not vary by more than  $\frac{1}{8}$  inch per foot of span of the top slab, with a maximum of  $\frac{5}{8}$  inches.

6. Reinforcing steel placement shall meet the tolerances specified in Section 6-02.3(24)C.

This section is supplemented with the following new subsection:

#### **7-02.3(6)A5 Wingwalls and Retaining Walls**

Wingwalls and retaining walls (including cutoff walls and headwalls) shall be constructed in accordance with the Contractor's design and Working Drawing submittal or when the Plans include a complete set of design details for a wall (defining panel shapes and dimensions, concrete strength requirements, and steel reinforcing bar, joint, and connection details), the details shown in the Plans.

Precast concrete construction shall conform to Sections 6-02.3(28) and 6-11.3(3).

Culvert bedding material shall be furnished, placed, and compacted in accordance with Section 7-02.3(6)A4.

#### **7-02.3(6)A1 Design Criteria**

The first sentence of the last paragraph is revised to read:

Whenever the minimum finished backfill or surfacing depth above the top of the Structure is less than 1'-0" (except when the top of the Structure is directly exposed to vehicular traffic), either all steel reinforcing bars in the span unit shall be epoxy-coated with 2" minimum concrete cover from the face of concrete to the face of the top mat of steel reinforcing bars, or the minimum concrete cover shall be 2½".

The last sentence of the last paragraph is revised to read:

Concrete cover from the face of any concrete surface to the face of any steel reinforcement shall be 1-inch minimum end clearance at all joints, and 2-inches minimum at all other locations.

#### **7-02.3(6)A2 Submittals**

The first paragraph is revised to read:

The Contractor shall submit shop drawings of the precast Structures. Fabrication shop drawings replicating complete design details when shown in the Plans shall be Type 2 Working Drawings. Submittals completing the design based on the schematic geometric requirements shown in the Plans, or proposing a Contractor designed alternative concrete culvert Structure shall be Type 2E Working Drawings with supporting design calculations.

The last paragraph is revised to read:

For precast Structures with a span length greater than 20-feet (as defined in Section 7-02.3(6)A1), except when the depth of fill above the top of culvert exceeds the

Structure span length, a Type 2E Working Drawing shall be submitted consisting of a load rating report prepared in accordance with the AASHTO Manual for Bridge Evaluation and WSDOT Bridge Design Manual LRFD M 23-50 Chapter 13. Soil pressures used shall include effects from the backfill material and compaction methods, and shall be in accordance with the WSDOT Geotechnical Design Manual M 46-03 and the geotechnical report prepared for the project.

#### **7-02.3(6)A3 Casting**

This section is revised to read:

Concrete shall conform to Section 6-02.3(28)B, with a 28-day compressive strength as specified in the Plans or the Working Drawings submittal.

#### **7-02.3(6)A4 Excavation and Bedding Preparation**

The last paragraph is revised to read:

The upper layer of bedding course shall be a 6-inch minimum thickness layer of culvert bedding material, defined as granular material either conforming to Section 9-03.12(3) or to AASHTO Grading No. 57 as specified in Section 9-03.1(4)C. The plan limits of the culvert bedding material shall extend 1-foot beyond the plan limits of the culvert or the Structure footing as applicable. The culvert bedding material shall be compacted in accordance with the Section 2-09.3(1)E requirements for gravel backfill for drains. After compaction, the culvert bedding material shall be screeded transversely to the specified line and grade. Voids in the screeded culvert bedding material shall be filled and then rescreeded prior to erecting the precast Structure.

#### **7-02.3(6)B3 Erection**

The last paragraph is revised to read:

Adjacent precast sections shall be connected by welding the weld-tie anchors in accordance with Section 6-03.3(25). Welding ground shall be attached directly to the steel plates being welded when welding the weld-ties. The weld-tie anchor spacing shall not exceed 6'-0". After connecting the weld-tie anchors, the Contractor shall paint the exposed metal surfaces with one coat of field primer conforming to Section 9-08.1(2)F. Keyways shall be filled with grout conforming to Section 9-20.3(2).

#### **7-02.3(6)C1 Casting**

This section is revised to read:

PRCSBC shall consist of lid elements and "U" shaped base elements. The vertical legs of the "U" shaped base elements shall be full height matching the rise of the culvert, except as otherwise specified for culvert spans greater than 20-feet. For PRCSBC spans greater than 20-feet (as defined in Section 7-02.3(6)A1), the lid elements may include vertical legs of a maximum length of 4-feet.

All vertical and horizontal joints of PRCBC and PRCSBC elements shall be tongue and groove type joints, except PRCBC and PRCSBC of 20-foot span or less may have keyway joints connected by weld-tie anchors in accordance with Section 6-02.3(25)O. The weld-tie anchor spacing shall not exceed 6'-0". There shall be at least two galvanized steel tie plates across each top unit tongue and groove joint and each

tongue and groove joint between upper and lower units, unless otherwise shown in the Plans or required by the seismic designed completed in accordance with Section 7-02.3(6)A1.

### **7-02.3(6)C3 Erection**

This section is revised to read:

PRCBC and PRCSBC shall be erected and backfilled in accordance with the erection sequence specified in the Working Drawing submittal, and the construction equipment restrictions specified in Section 6-02.3(25)O.

The Contractor shall install a continuous strip of butyl rubber sealant within all tongue and groove joints prior to connecting the precast elements together. The butyl rubber sealant shall have a minimum cross section of 1/2-inch by 1 1/2-inch, unless otherwise shown in the Plans.

After connecting the joints with weld-tie anchors, the Contractor shall paint the exposed metal surfaces with one coat of field primer conforming to Section 9-08.1(2)F. Keyways shall be filled with grout conforming to Section 9-20.3(2).

The Contractor shall wrap all exterior joints along the top and sides of the PRCBC and PRCSBC with a 12-inch wide strip of external sealing band centered about the joint and adhesively bonded to the concrete surface.

Backfill beside the PRCBC and PRCSBC shall be brought up in sequential layers, compacted concurrently. The difference in backfill height on opposing sides of the Structure shall not exceed 2-feet.

### **7-02.4 Measurement**

This section is supplemented with the following:

Culvert bedding material will be measured by the cubic yard of material placed.

### **7-02.5 Payment**

This section is supplemented with the following:

"Culvert Bedding Material", per cubic yard.

7-08.AP7

## **Section 7-08, General Pipe Installation Requirements January 3, 2017**

### **7-08.3(1)A Trenches**

The second sentence of the last paragraph is revised to read:

The embankment material shall be compacted to 95 percent of maximum density and the moisture content at the time of compaction shall be between optimum and 3 percentage points below optimum as determined by the Compaction Control Tests specified in Section 2-03.3(14)D.



7-09.AP7

## **Section 7-09, Water Mains**

**April 3, 2017**

### **7-09.3(24)D Dry Calcium Hypochlorite**

The second paragraph is revised to read:

The number of grams of 70 percent test calcium hypochlorite required for a 20-foot length of pipe equals  $0.238 \times d^2$ , in which “d” is the diameter in inches.

8-01.AP8

## **Section 8-01, Erosion Control and Water Pollution Control**

**August 1, 2016**

### **8-01.2 Materials**

This section is supplemented with the following new paragraph:

Recycled concrete, in any form, shall not be used for any Work defined in Section 8-01.

### **8-01.3(7) Stabilized Construction Entrance**

The last sentence of the first paragraph is revised to read:

Material used for stabilized construction entrance shall be free of extraneous materials that may cause or contribute to track out.

### **8-01.3(8) Street Cleaning**

This section is revised to read:

Self-propelled street sweepers shall be used to remove and collect sediment and other debris from the Roadway, whenever required by the Engineer. The street sweeper shall effectively collect these materials and prevent them from being washed or blown off the Roadway or into waters of the State. Street sweepers shall not generate fugitive dust and shall be designed and operated in compliance with applicable air quality standards.

Material collected by the street sweeper shall be disposed of in accordance with Section 2-03.3(7)C.

Street washing with water will require the concurrence of the Engineer.

8-09.AP8

## **Section 8-09, Raised Pavement Markers**

**January 3, 2017**

### **8-09.5 Payment**

In the last paragraph, “flaggers and spotters” is revised to read “flaggers”.

8-10.AP8

## **Section 8-10, Guide Posts**

**January 4, 2016**

### **8-10.3 Construction Requirements**

The last sentence of the second paragraph is deleted.

8-11.AP8

## **Section 8-11, Guardrail**

**January 17, 2017**

### **8-11.3(1)C Terminal and Anchor Installation**

This section is supplemented with the following new paragraph:

Beam Guardrail Non-flared Terminals for Type 1 guardrail shall meet the crash test and evaluation criteria of NCHRP 350 or the Manual for Assessing Safety Hardware (MASH). Beam Guardrail Non-flared Terminals for Type 31 guardrail shall meet the crash test and evaluation criteria of MASH.

### **8-11.3(1)F Removing and Resetting Beam Guardrail**

The last sentence of the first paragraph is deleted.

### **8-11.5 Payment**

The paragraph following the Bid item "Removing and Resetting Beam Guardrail", per linear foot is revised to read:

The unit Contract price per linear foot for "Removing and Resetting Beam Guardrail" shall be full payment for all costs to perform the Work as described in Section 8-11.3(1)F, except for replacement posts and blocks.

The paragraph following the Bid item "Raising Existing Beam Guardrail", per linear foot is revised to read:

The unit Contract price per linear foot for "Raising Existing Beam Guardrail" shall be full payment for all costs to perform the Work as described in Section 8-11.3(1)E, except for replacement posts and blocks.

8-20.AP8

## **Section 8-20, Illumination, Traffic Signal Systems, Intelligent Transportation Systems, and Electrical**

**August 7, 2017**

### **8-20.1 Description**

This section is supplemented with the following new subsection:

#### **8-20.1(3) Permitting and Inspections**

Electrical installations are subject to electrical inspection in accordance with RCW 19.28.101. Electrical inspections may only be performed by an electrical inspector meeting the requirements of RCW 19.28.321. Electrical installations will not be accepted until they have been inspected and approved by an electrical inspector as

required by this Section. This inspection is required even if there is no new electrical service or new electrical meter being installed in the Contract.

Installations within WSDOT right of way are subject to a minimum of a final inspection by a WSDOT certified electrical inspector as allowed by RCW 19.28.141. A separate permit is not required for electrical installations within WSDOT right of way. Additional inspections may be required at the discretion of the Engineer.

Installations outside of WSDOT right of way are subject to permitting and inspection by the Washington State Department of Labor and Industries (L&I) or a local jurisdiction approved for that location by L&I. Approved local jurisdictions and their contacts may be found on the L&I website at <http://www.lni.wa.gov/TradesLicensing/Electrical/FeePermlInsp/CityInspectors/>.

### **8-20.1(1) Regulations and Code**

The second paragraph is revised to read:

Wherever reference is made in these Specifications or in the Special Provisions to the Code, the rules, or the standards mentioned above, the reference shall be construed to mean the code, rule, or standard that is in effect on the Bid advertisement date.

### **8-20.3(5)A General**

The last paragraph is revised to read:

Immediately after the sizing mandrel has been pulled through, install an equipment grounding conductor if applicable (see Section 8-20.3(9)) and any new or existing wire or cable as specified in the Plans. Where conduit is installed for future use, install a 200-pound minimum tensile strength pull string with the equipment grounding conductor. The pull string shall be attached to duct plugs or caps at both ends of the conduit.

### **8-20.3(5)A1 Fiber Optic Conduit**

The last paragraph is deleted.

### **8-20.3(5)B Conduit Type**

The second and third paragraphs are deleted and replaced with the following new paragraph:

PVC and HDPE conduits shall be Schedule 80 unless installed as innerduct.

### **8-20.3(5)D Conduit Placement**

Item number 2 is revised to read:

2. 24-inches below the top of the untreated surfacing on a Roadbed.

### **8-20.3(9) Bonding, Grounding**

The following two new paragraphs are inserted after the first paragraph:

Install an equipment grounding conductor in all new conduit, whether or not the equipment grounding conductor is called for in the wire schedule.

For each new conduit with innerduct install an equipment grounding conductor in only one of the innerducts unless otherwise required by the NEC or the Plans.

The fourth paragraph (after the preceding Amendments are applied) is revised to read:

Bonding jumpers and equipment grounding conductors meeting the requirements of Section 9-29.3(2)A3 shall be minimum #8 AWG, installed in accordance with the NEC. Where existing conduits are used for the installation of new circuits, an equipment grounding conductor shall be installed unless an existing equipment ground conductor, which is appropriate for the largest circuit, is already present in the existing raceway. The equipment ground conductor between the isolation switch and the sign lighter fixtures shall be minimum #14 AWG stranded copper conductor. Where parallel circuits are enclosed in a common conduit, the equipment-grounding conductor shall be sized by the largest overcurrent device serving any circuit contained within the conduit.

The second sentence of the fifth paragraph (after the preceding Amendments are applied) is revised to read:

A non-insulated stranded copper conductor, minimum #8 AWG with a full circle crimp on connector (crimped with a manufacturer recommended crimper) shall be connected to the junction box frame or frame bonding stud, the other end shall be crimped to the equipment bonding conductor, using a "C" type crimp connector.

The last two sentences of the sixth paragraph (after the preceding Amendments are applied) are revised to read:

For light standards, signal standards, cantilever and sign bridge Structures the supplemental grounding conductor shall be #4 AWG non-insulated stranded copper conductor. For steel sign posts which support signs with sign lighting or flashing beacons the supplemental grounding conductor shall be #6 AWG non insulated stranded copper conductor.

The fourth to last paragraph is revised to read:

Install a two grounding electrode system at each service entrance point, at each electrical service installation and at each separately derived power source. The service entrance grounding electrode system shall conform to the "Service Ground" detail in the Standard Plans. If soil conditions make vertical grounding electrode installation impossible an alternate installation procedure as described in the NEC may be used. Maintain a minimum of 6 feet of separation between any two grounding electrodes within the grounding system. Grounding electrodes shall be bonded copper, ferrous core materials and shall be solid rods not less than 10 feet in length if they are ½ inch in diameter or not less than 8 feet in length if they are ¾ inch or larger in diameter.

#### **8-20.3(13)A Light Standards**

The first sentence in the second to last paragraph is revised to read:

All new and relocated metal light standards shall be numbered for identification using painted 4 inch block gothic letters (similar to series C highway lettering) and numbers installed 3 feet above the base facing the Traveled Way.

The numbered list in the second to last paragraph is deleted and replaced with the following:

NN  
CC-SSSS  
VVV

Where:

**NN** – Is the pole number as identified in the Plans. May be one or more characters.

**CC** – Is the circuit letter as identified in the Plans. May be one or more characters.

**SSSS** – Is the service cabinet number as identified in the Plans. Do not include the two or three letter prefix. Up to four digits - do not include leading zeros.

**VVV** – Is the operating voltage of the luminaire. Always three digits.

### **8-20.3(13)C Luminaires**

The first paragraph is revised to read:

The Contractor shall mark the installation date on the inside of the luminaire ballast or driver housing using a permanent marking pen.

8-22.AP8

## **Section 8-22, Pavement Marking August 7, 2017**

### **8-22.3(6) Removal of Pavement Markings**

This section is revised to read:

Pavement markings to be removed shall be obliterated until all blemishes caused by the pavement marking removal conform to the coloration of the adjacent pavement.

Grinding to remove pavement markings in their entirety is allowed in areas designated for applications of either Hot Mix Asphalt (HMA) or Bituminous Surface Treatment (BST). Pavement marking removal shall be performed from April 1<sup>st</sup> through September 30<sup>th</sup> and only in those areas that shall be paved within the same time window as the grinding, unless otherwise allowed by the Engineer in writing.

For all cement concrete pavement and areas that will not be overlaid with hot mix asphalt or BST, grinding is allowed to a depth just above the pavement surface and then Water blasting or shot blasting shall be required to remove the remaining pavement markings.

If in the opinion of the Engineer, the pavement is materially damaged by pavement marking removal, such damage shall be repaired by the Contractor in accordance with Section 1-07.13(1). Sand or other material deposited on the pavement as a result of removing lines and markings shall be removed as the Work progresses to avoid hazardous conditions. Accumulation of sand or other material which might interfere with drainage will not be permitted.

#### **8-22.4 Measurement**

The first two sentences of the fourth paragraph are revised to read:

The measurement for “Painted Wide Lane Line”, “Plastic Wide Lane Line”, “Profiled Plastic Wide Lane Line”, “Painted Barrier Center Line”, “Plastic Barrier Center Line”, “Painted Stop Line”, “Plastic Stop Line”, “Painted Wide Dotted Entry Line”, or “Plastic Wide Dotted Entry Line” will be based on the total length of each painted, plastic or profiled plastic line installed. No deduction will be made for the unmarked area when the marking includes a broken line such as, wide broken lane line, drop lane line, wide dotted lane line or wide dotted entry line.

#### **8-22.5 Payment**

The following two new Bid items are inserted after the Bid item “Plastic Crosshatch Marking”, per linear foot:

“Painted Wide Dotted Entry Line”, per linear foot.

“Plastic Wide Dotted Entry Line”, per linear foot.

9-01.AP9

### **Section 9-01, Portland Cement August 7, 2017**

This section’s title is revised to read:

#### **Cement**

##### **9-01.1 Types of Cement**

This section is revised to read:

Cement shall be classified as portland cement, blended hydraulic cement, or rapid hardening hydraulic cement.

##### **9-01.2(2) Vacant**

This section, including title, is revised to read:

##### **9-01.2(2) Rapid Hardening Hydraulic Cement**

Rapid hardening hydraulic cement shall meet the requirements of ASTM C 1600.

##### **9-01.2(3) Low Alkali Cement**

This section is renumbered as follows:

##### **9-01.2(1)A Low Alkali Cement**

##### **9-01.2(4) Blended Hydraulic Cement**

This section is renumbered as follows:

##### **9-01.2(1)B Blended Hydraulic Cement**

1 In the first paragraph, items number 3 through 5 are revised to read:

- 2
- 3 3. Type IT(PX)(LY), where (PX) equals the targeted percentage of pozzolan, and
- 4 (LY) equals the targeted percentage of limestone. The pozzolan (PX) shall be
- 5 Class F fly ash and shall be a maximum of 35 percent. (LY) shall be a minimum of
- 6 5 percent and a maximum of 15 percent. Separate testing of each source of fly ash
- 7 at each proposed replacement level shall be conducted in accordance with
- 8 ASTM C1012. Expansion at 180 days shall be 0.10 percent or less.
- 9
- 10 4. Type IT(SX)(LY), where (SX) equals the targeted percentage of slag cement, and
- 11 (LY) equals the targeted percentage of limestone. (SX) shall be a maximum of
- 12 50 percent. (LY) shall be a minimum of 5 percent and a maximum of 15 percent.
- 13 Separate testing of each source of slag at each proposed replacement level shall
- 14 be conducted in accordance with ASTM C1012. Expansion at 180 days shall be
- 15 0.10 percent or less.
- 16
- 17 5. Type IL(X), where (X) equals the targeted percentage of limestone, and shall be a
- 18 minimum of 5 percent and a maximum of 15 percent. Testing shall be conducted in
- 19 accordance with ASTM C1012. Expansion at 180 days shall be 0.10 percent or
- 20 less.
- 21

### 22 **9-01.3 Tests and Acceptance**

23 The second paragraph is revised to read:

24

25 Cement producers/suppliers that certify portland cement or blended hydraulic cement

26 shall participate in the Cement Acceptance Program as described in WSDOT Standard

27 Practice QC 1. Rapid hardening hydraulic cement producers/suppliers are not required

28 to participate in WSDOT Standard Practice QC 1.

29

30 9-03.AP9

### 31 **Section 9-03, Aggregates**

32 **August 7, 2017**

#### 33 **9-03.1(1) General Requirements**

34 In this section, each reference to "Section 9-01.2(3)" is revised to read "Section 9-01.2(1)A".

35

36 This first paragraph is supplemented with the following:

37

38 Reclaimed aggregate may be used if it complies with the specifications for Portland

39 Cement Concrete. Reclaimed aggregate is aggregate that has been recovered from

40 plastic concrete by washing away the cementitious materials.

41

#### 42 **9-03.1(2) Fine Aggregate for Portland Cement Concrete**

43 This section is revised to read:

44

45 Fine aggregate shall consist of natural sand or manufactured sand, or combinations

46 thereof, accepted by the Engineer, having hard, strong, durable particles free from

47 adherent coating. Fine aggregate shall be washed thoroughly to meet the

48 specifications.

49

1 **9-03.1(2)A Deleterious Substances**

2 This section is revised to read:

3  
4 The amount of deleterious substances in the washed aggregate shall be tested in  
5 accordance with AASHTO M 6 and not exceed the following values:

6

|                                                 |                        |
|-------------------------------------------------|------------------------|
| 7 Material finer than No. 200 Sieve             | 2.5 percent by weight  |
| 8 Clay lumps and friable particles              | 3.0 percent by weight  |
| 9 Coal and lignite                              | 0.25 percent by weight |
| 10 Particles of specific gravity less than 2.00 | 1.0 percent by weight. |

11

12 Organic impurities shall be tested in accordance with AASHTO T 21 by the glass  
13 color standard procedure and results darker than organic plate no. 3 shall be  
14 rejected. A darker color results from AASHTO T 21 may be used provided that  
15 when tested for the effect of organic impurities on strength of mortar, the relative  
16 strength at 7 days, calculated in accordance with AASHTO T 71, is not less than  
17 95 percent.

18  
19 **9-03.1(4) Coarse Aggregate for Portland Cement Concrete**

20 This section is revised to read:

21  
22 Coarse aggregate for concrete shall consist of gravel, crushed gravel, crushed stone,  
23 or combinations thereof having hard, strong, durable pieces free from adherent  
24 coatings. Coarse aggregate shall be washed to meet the specifications.

25  
26 **9-03.1(4)A Deleterious**

27 This section, including title, is revised to read:

28  
29 **9-03.1(4)A Deleterious Substances**

30 The amount of deleterious substances in the washed aggregate shall be tested in  
31 accordance with AASHTO M 80 and not exceed the following values:

32

|                                                |                                    |
|------------------------------------------------|------------------------------------|
| 33 Material finer than No. 200                 | 1.0 <sup>1</sup> percent by weight |
| 34 Clay lumps and Friable Particles            | 2.0 percent by weight              |
| 35 Shale                                       | 2.0 percent by weight              |
| 36 Wood waste                                  | 0.05 percent by weight             |
| 37 Coal and Lignite                            | 0.5 percent by weight              |
| 38 Sum of Clay Lumps, Friable Particles, and   |                                    |
| 39 Chert (Less Than 2.40 specific gravity SSD) | 3.0 percent by weight              |

40

41 <sup>1</sup>If the material finer than the No. 200 sieve is free of clay and shale, this  
42 percentage may be increased to 1.5.

43  
44 **9-03.1(4)C Grading**

45 The following new sentence is inserted at the beginning of the last paragraph:

46  
47 Where coarse aggregate size 467 is used, the aggregate may be furnished in at least  
48 two separate sizes.



**9-03.1(5) Combined Aggregate Gradation for Portland Cement Concrete**

This section is revised to read:

As an alternative to using the fine aggregate sieve grading requirements in Section 9-03.1(2)B, and coarse aggregate sieve grading requirements in Section 9-03.1(4)C, a combined aggregate gradation conforming to the requirements of Section 9-03.1(5)A may be used.

**9-03.1(5)A Deleterious Substances**

This section is revised to read:

The amount of deleterious substances in the washed aggregates  $\frac{3}{8}$  inch or larger shall not exceed the values specified in Section 9-03.1(4)A and for aggregates smaller than  $\frac{3}{8}$  inch they shall not exceed the values specified in Section 9-03.1(2)A.

**9-03.1(5)B Grading**

The first paragraph is deleted.

**9-03.8(2) HMA Test Requirements**

In the table in item number 3, the heading "Statistical and Nonstatistical" is revised to read "Statistical".

**9-03.8(7) HMA Tolerances and Adjustments**

In the table in item number 1, the column titled "Nonstatistical Evaluation" is deleted.

In the table in item 1, the last column titled "Commercial Evaluation" is revised to read "Visual Evaluation".

**9-03.11(1) Streambed Sediment**

The following three new sentences are inserted after the first sentence of the first paragraph:

Alternate gradations may be used if proposed by the Contractor and accepted by the Engineer. The Contractor shall submit a Type 2 Working Drawing consisting of 0.45 power maximum density curve of the proposed gradation. The alternate gradation shall closely follow the maximum density line and have Nominal Aggregate Size of no less than  $1\frac{1}{2}$  inches or no greater than 3 inches.

**9-03.12(4) Gravel Backfill for Drains**

The following new sentence is inserted at the beginning of the second paragraph:

As an alternative, AASHTO grading No. 57 may be used in accordance with Section 9-03.1(4)C.

**9-03.12(5) Gravel Backfill for Drywells**

The following new sentence is inserted at the beginning of the second paragraph:

As an alternative, AASHTO grading No. 4 may be used in accordance with Section 9-03.1(4)C.

**9-03.21(1)B Concrete Rubble**

This section, including title, is revised to read:

**9-03.21(1)B Recycled Concrete Aggregate**

Recycled concrete aggregates are coarse aggregates manufactured from hardened concrete mixtures. Recycled concrete aggregate may be used as coarse aggregate or blended with coarse aggregate for Commercial Concrete. Recycled concrete aggregate shall meet all of the requirements for coarse aggregate contained in Section 9-03.1(4) or 9-03.1(5). In addition to the requirements of Section 9-03.1(4) or 9-03.1(5), recycled concrete shall:

1. Contain an aggregated weight of less than 1 percent of adherent fines, vegetable matter, plastics, plaster, paper, gypsum board, metals, fabrics, wood, tile, glass, asphalt (bituminous) materials, brick, porcelain or other deleterious substance(s) not otherwise noted;
2. Be free of components such as chlorides and reactive materials that are detrimental to the concrete, unless mitigation measures are taken to prevent recurrence in the new concrete;
3. Have an absorption of less than 10 percent when tested in accordance with AASHTO T 85.
4. Be considered mechanically fractured and therefore be considered part of the total fracture calculation as determined by the FOP for AASHTO T 335.

Recycled concrete aggregate shall be in a saturated condition prior to mixing.

Recycled concrete aggregate shall not be placed below the ordinary high water mark of any surface water of the State.

**9-03.21(1)D Recycled Steel Furnace Slag**

This section title is revised to read:

**Steel Slag**

**9-03.21(1)E Table on Maximum Allowable Percent (By Weight) of Recycled Material**

In the Hot Mix Asphalt column, each value of "20" is revised to read "25".

The last column heading "Steel Furnace Slag" is revised to read "Steel Slag".

The following new row is inserted after the second row:

|                                          |           |   |     |   |   |
|------------------------------------------|-----------|---|-----|---|---|
| Coarse Aggregate for Commercial Concrete | 9-03.1(4) | 0 | 100 | 0 | 0 |
|------------------------------------------|-----------|---|-----|---|---|

9-04.AP9

## **Section 9-04, Joint and Crack Sealing Materials**

**January 3, 2017**

This section is supplemented with the following two new subsections:

### **9-04.11 Butyl Rubber Sealant**

Butyl rubber sealant shall conform to ASTM C 990.

### **9-04.12 External Sealing Band**

External sealing band shall by Type III B conforming to ASTM C 877.

## **9-04.1(2) Premolded Joint Filler for Expansion Joints**

This section is supplemented with the following:

As an alternative to the above, a semi-rigid, non-extruding, resilient type, closed-cell polypropylene foam, preformed joint filler with the following physical properties as tested to AASHTO T 42 Standard Test Methods may be used.

| <b>Closed-Cell Polypropylene Foam Preformed Joint Filler</b> |                    |                    |
|--------------------------------------------------------------|--------------------|--------------------|
| <b>Physical Property</b>                                     | <b>Requirement</b> | <b>Test Method</b> |
| Water Absorption                                             | < 1.0%             | AASHTO T 42        |
| Compression Recovery                                         | > 80%              | AASHTO T 42        |
| Extrusion                                                    | < 0.1 in.          | AASHTO T 42        |
| Density                                                      | > 3.5 lbs./cu.ft.  | AASHTO T 42        |
| Water Boil (1 hr.)                                           | No expansion       | AASHTO T 42        |
| Hydrochloric Acid Boil (1 hr.)                               | No disintegration  | AASHTO T 42        |
| Heat Resistance °F                                           | 392°F± 5°F         | ASTM D 5249        |

## **9-04.2(1) Hot Poured Joint Sealants**

This section's content is deleted and replaced with the following new subsections:

### **9-04.2(1)A Hot Poured Sealant**

Hot poured sealant shall be sampled in accordance with ASTM D5167 and tested in accordance with ASTM D5329.

#### **9-04.2(1)A1 Hot Poured Sealant for Cement Concrete Pavement**

Hot poured sealant for cement concrete pavement shall meet the requirements of ASTM D6690 Type IV, except for the following:

1. The Cone Penetration at 25°C shall be 130 maximum.
2. The extension for the Bond, non-immersed, shall be 100 percent.

#### **9-04.2(1)A2 Hot Poured Sealant for Bituminous Pavement**

Hot poured sealant for bituminous pavement shall meet the requirements of ASTM D6690 Type I or Type II.

**9-04.2(1)B Sand Slurry for Bituminous Pavement**

Sand slurry is mixture consisting of the following components measured by total weight:

1. Twenty percent CSS-1 emulsified asphalt,
2. Two percent portland cement, and
3. Seventy-eight percent fine aggregate meeting the requirements of 9-03.1(2)B Class 2. Fine aggregate may be damp (no free water).

**9-04.2(2) Poured Rubber Joint Sealer**

The last paragraph is deleted.

**9-04.4(1) Rubber Gaskets for Concrete Pipes and Precast Manholes**

"AASHTO M 198" is revised to read "ASTM C 990".

**9-04.4(3) Gaskets for Aluminum or Steel Culvert or Storm Sewer Pipe**

In the last sentence, "AASHTO M 198" is revised to read "ASTM C 990".

9-06.AP9

**Section 9-06, Structural Steel and Related Materials**

**January 3, 2017**

**9-06.5(3) High-Strength Bolts**

In this section, "ASTM A325" is revised to read "ASTM F3125 Grade A325", "ASTM A490" is revised to read "ASTM F3125 Grade A490", and "ASTM F1852" is revised to read "ASTM F3125 Grade F1852".

In the fifth paragraph, "ASTM-A325" is revised to read "ASTM F3125".

**9-06.12 Bronze Castings**

In this section, "AASHTO M107" is revised to read "ASTM B22".

**9-06.16 Roadside Sign Structures**

In the first paragraph, "ASTM A325" is revised to read "ASTM F3125 Grade A325".

9-07.AP9

**Section 9-07, Reinforcing Steel**

**August 1, 2016**

**9-07.1(1)A Acceptance of Materials**

The first sentence of the first paragraph is revised to read:

Reinforcing steel rebar manufacturers shall comply with the National Transportation Product Evaluation Program (NTPEP) Work Plan for Reinforcing Steel (rebar) Manufacturers.

The first sentence of the second paragraph is revised to read:

Steel reinforcing bar manufacturers use either English or a Metric size designation while stamping rebar.

### **9-07.1(2) Bending**

The first two sentences of the first paragraph are deleted and replaced with the following two new sentences:

Steel reinforcing bars shall be cut and bent cold to the shapes shown on the Plans.  
Fabrication tolerances shall be in accordance with ACI 315.

9-10.AP9

## **Section 9-10, Piling**

**August 1, 2016**

### **9-10.3 Cast-In-Place Concrete Piling**

This section is revised to read:

Reinforcement for cast-in-place concrete piles shall conform to Section 9-07.2.

9-11.AP9

## **Section 9-11, Waterproofing**

**January 3, 2017**

This section (and all subsections), including title, is revised to read:

### **9-11 Waterproof Membrane**

#### **9-11.1 Asphalt for Waterproofing**

Waterproof membrane shall be a sheet membrane conforming to ASTM D 6153 Type III, the puncture capacity specified below, and either the thin polymer sheet tensile stress or the geotextile and fabric grab tensile strength specified below:

| <b>Performance Properties</b>                                           | <b>Test Method</b>                 | <b>Specification Requirements</b> |
|-------------------------------------------------------------------------|------------------------------------|-----------------------------------|
| Tensile Stress<br>(for Thin Polymer Sheets)                             | ASTM D 882                         | 75 pounds per inch min.           |
| Grab Tensile Strength<br>(for Geotextiles and Fabrics)                  | ASTM D 4632<br>(Woven or Nonwoven) | 200 pounds min.                   |
| Puncture Capacity<br>(For Thin Polymer Sheets, Geotextiles and Fabrics) | ASTM E 154                         | 200 pounds min.                   |

Waterproofing membrane will be accepted based on a Manufacturer's Certificate of Compliance with each lot of waterproof membrane.

#### **9-11.2 Primer for Waterproof Membrane**

The primer for the waterproof membrane shall be appropriate for bonding the sheet membrane to the bridge deck surface and shall be compatible with the

membrane in accordance with the waterproof membrane manufacturer's recommendations.

9-14.AP9

## **Section 9-14, Erosion Control and Roadside Planting August 7, 2017**

### **9-14.4(2) Hydraulically Applied Erosion Control Products (HECPs)**

The first paragraph is revised to read:

All HECPs shall be made of natural plant fibers unaltered by synthetic materials, and in a dry condition, free of noxious weeds, seeds, chemical printing ink, germination inhibitors, herbicide residue, chlorine bleach, rock, metal, plastic, and other materials detrimental to plant life.

The last sentence of the third paragraph is revised to read the following two sentences:

Under no circumstances will field mixing of additives or components be acceptable, with the exception of seed and water. The product shall be hydrated in accordance with the manufacturer's recommendations.

In Table 1 of the fourth paragraph, the following new row is inserted below the table heading:

|                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>These test requirements apply to the fully mixed product, including tackifiers, dyes, or other additives that may be included in the HECP final product in its sprayable form.</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The last two paragraphs are revised to read:

If the HECP contains a dye to facilitate placement and inspection of the material, it shall be nontoxic to plants, animals, and aquatic life and shall not stain concrete or painted surfaces.

The HECP shall not be harmful to plants, animals, and aquatic life.

### **9-14.4(4) Wood Strand Mulch**

The last paragraph is revised to read:

The Contractor shall provide a test report performed in accordance with WSDOT T 125 demonstrating compliance to this specification prior to acceptance. This product shall not be harmful to plants, animals, and aquatic life.

### **9-14.4(7) Tackifier**

The first paragraph is supplemented with the following:

Tackifiers shall include a mulch tracer added to visible aid uniform application, and shall not be harmful to plants, animals, or aquatic life.

The first sentence of the second paragraph is revised to read:

The Contractor shall provide test results documenting the tackifier and mulch tracer meets the requirements for Acute Toxicity, Solvents, and Heavy Metals as required in Table 1 in Section 9-14.4(2).

#### **9-14.4(7)A Organic Tackifier**

This section is revised to read:

Organic tackifiers shall be derived from natural plant sources and shall not be harmful to plants, animals, and aquatic life.

#### **9-14.4(7)B Synthetic Tackifier**

This section is revised to read:

Synthetic tackifiers shall not be harmful to plants, animals, and aquatic life.

#### **9-14.5(2) Biodegradable Erosion Control Blanket**

The first paragraph is revised to read:

Biodegradable erosion control blankets, including netting if present, shall be made of natural plant fibers unaltered by synthetic materials. All blanket material shall effectively perform the intended erosion control function until permanent vegetation has been established, or for a minimum of 6 months, whichever comes first.

#### **9-14.5(4)A Biodegradable Check Dams**

This section is revised to read:

Biodegradable check dams shall meet the following requirements:

|              |                   |
|--------------|-------------------|
| Wattle       | Section 9-14.5(5) |
| Compost Sock | Section 9-14.5(6) |
| Coir Log     | Section 9-14.5(7) |

The Contractor may substitute a different biodegradable check dam as long as it complies with the following and is accepted by the Engineer:

1. Made of natural plant fiber unaltered by synthetic material.
2. Netting if present shall be made of natural plant fibers unaltered by synthetic materials. Materials shall effectively perform the intended erosion control function until permanent vegetation has been established or for a minimum of 6 months, whichever comes first.
3. Straw bales shall not be used as check dams.

1 **9-14.5(5) Wattles**

2 This section is revised to read:

3  
4 Wattles shall consist of cylinders of plant material such as weed-free straw, coir, wood  
5 chips, excelsior, or wood fiber or shavings encased within netting made of natural plant  
6 fibers unaltered by synthetic materials. Wattles shall be a minimum of 8 inches in  
7 diameter. Netting material shall be clean, evenly woven, and free of encrusted concrete  
8 or other contaminating materials such as preservatives. Netting material shall be free  
9 from cuts, tears, or weak places and shall effectively perform the intended erosion  
10 control function until permanent vegetation has been established or for a minimum of  
11 6 months, whichever comes first.

12  
13 If wood chip filler is used, it shall meet the material requirements as specified in  
14 Section 9-14.4(3). If straw filler is used, it shall meet the material requirements as  
15 specified in Section 9-14.4(1). If wood shavings are used, 80 percent of the fibers shall  
16 have a minimum length of 6 inches between 0.030 and 0.50 inches wide and between  
17 0.017 and 0.13 inches thick.

18  
19 Stakes for wattles shall be made of wood from untreated Douglas fir, hemlock, or pine  
20 species.

21  
22 **9-14.5(6) Compost Socks**

23 This section is revised to read:

24  
25 Compost socks shall consist of fabric made of natural plant fibers unaltered by  
26 synthetic materials. The compost sock shall be filled with Medium Compost as  
27 specified in Section 9-14.4(8). Compost socks shall be at least 8 inches in diameter.  
28 The sock shall be clean, evenly woven; free of encrusted concrete or other  
29 contaminating materials; free from cuts, tears, broken or missing yarns; free of thin,  
30 open, or weak areas; and free of any type of preservative. Sock fabric shall effectively  
31 perform the intended erosion control function until permanent vegetation has been  
32 established or for a minimum of 6 months, whichever comes first.

33  
34 Stakes for compost socks shall be made of wood from untreated Douglas fir, hemlock,  
35 or pine species.

36  
37 9-16.AP9

38 **Section 9-16, Fence and Guardrail**  
39 **January 17, 2017**

40 **9-16.3(3) Galvanizing**

41 The first three sentences are deleted and replaced with the following single sentence:

42  
43 W-beam or thrie beam rail elements and terminal sections shall be galvanized in  
44 accordance with AASHTO M 180, Class A, Type II.  
45



9-20.AP9

**Section 9-20, Concrete Patching Material, Grout, and Mortar**  
**January 3, 2017**

This section is supplemented with the following new subsection:

**9-20.5 Bridge Deck Repair Material**

Bridge deck repair material shall be either an ultra-low viscosity, two-part liquid, polyurethane-hybrid polymer concrete, or a pre-packaged cement based repair mortar, conforming to the following requirements:

1. Minimum compressive strength of 2,500 psi, in accordance with ASTM C 109.
2. Total soluble chloride ion content by mass of product shall conform to the limits specified in Section 6-02.3(2) for reinforced concrete.
3. Permeability of less than 2,000 coulombs at 56-days in accordance with AASHTO T 277.

If pre-packaged deck repair material does not include coarse aggregate, the Contractor shall extend the mix with coarse aggregate as recommended by the manufacturer.

9-23.AP9

**Section 9-23, Concrete Curing Materials and Admixtures**  
**January 3, 2017**

**9-23.9 Fly Ash**

The first paragraph is revised to read:

Fly ash shall conform to the requirements of AASHTO M295 Class C or F including supplementary optional chemical requirements as set forth in Table 2.

The last sentence of the last paragraph is revised to read:

The supplementary optional chemical limits in AASHTO M295 Table 2 do not apply to fly ash used in Controlled Density Fill.

**9-23.12 Metakaolin**

This section, including title, is revised to read:

**9-23.12 Natural Pozzolan**

Natural Pozzolans shall be either Metakaolin or ground Pumice and shall conform to the requirements of AASHTO M295 Class N, including supplementary optional chemical requirements as set forth in Table 2.

9-28.AP9

**Section 9-28, Signing Materials and Fabrication  
April 3, 2017**

**9-28.14(3) Aluminum Structures**

This section is revised to read:

Welding of aluminum shall be in accordance with AWS D1.2/D1.2M, latest edition, Structural Welding Code – Aluminum.

Aluminum alloy filler metals utilized on anodized structures shall result in color matching to base metals.

9-29.AP9

**Section 9-29, Illumination, Signal, Electrical  
August 7, 2017**

**9-29.2 Junction Boxes, Cable Vaults, and Pull Boxes**

This section is supplemented with the following new subsections:

**9-29.2(5) Testing Requirements**

The Contractor shall provide for testing of junction boxes, cable vaults and pull boxes. Junction boxes, cable vaults and pull boxes shall be tested by an independent materials testing facility, and a test report issued documenting the results of the tests performed.

For each junction box, vault and pull box type, the independent testing laboratory shall meet the requirements of AASHTO R 18 for Qualified Tester and Verified Test Equipment. The test shall be conducted in the presence of a Professional Engineer, licensed under Title 18 RCW, State of Washington, in the branch of Civil or Structural, and each test sheet shall have the Professional Engineer's original signature, date of signature, original seal, and registration number. One copy of the test report shall be furnished to the Contracting Agency certifying that the box and cover meet or exceed the loading requirements for that box type, and shall include the following information:

1. Product identification.
2. Date of testing.
3. Description of testing apparatus and procedure.
4. All load deflection and failure data.
5. Weight of box and cover tested.
6. Upon completion of the required test(s) the box shall be loaded to failure or to the maximum load possible on the testing machine (70,000 pounds minimum).
7. A brief description of type and location of failure or statement that the testing machine reached maximum load without failure of the box.

Standard Duty Concrete Junction Boxes, Cable Vaults, and Pull Boxes shall be load tested to 22,500 pounds. The test load shall be applied uniformly through a 10 by 10 by 1-inch steel plate centered on the lid. The test load shall be applied and released ten times, and the deflection at the test load and released state shall be recorded for each interval. At each interval the junction box shall be inspected for lid deformation, failure of the lid/frame welds, vertical and horizontal displacement of the lid/frame, cracks, and concrete spalling.

1. Permanent deformation of the lid or any impairment to the function of the lid.
2. Vertical or horizontal displacement of the lid frame.
3. Cracks wider than 0.012 inches that extend 12 inches or more.
4. Fracture or cracks passing through the entire thickness of the concrete.
5. Spalling of the concrete.

Security lids used to retrofit existing Standard Duty Concrete Junction Boxes shall be tested as follows:

1. The security lid shall be installed on any appropriately sized box that is currently approved on the Qualified Products List.
2. The security lid and box assembly shall be load tested in accordance with Section 9-29.2(5)A. After the ten load cycles but before loading to failure, the security lid shall be fully opened and removed to verify operability.
3. The locking mechanism(s) shall be tested as follows:
  - a. The locking mechanism shall be cycled 250 times (locked, then unlocked again) at room temperature (60-80°F). If there is more than one identical locking mechanism, only one needs to be cycled in this manner.
  - b. Temperature changes should be limited to no more than 60°F per hour.
  - c. The security lid shall be cooled to and held at -30°F for 15 minutes. The locking mechanism shall then be cycled once to verify operation at this temperature.

- d. The security lid shall be heated to and held at 120-122°F for 15 minutes. The locking mechanism shall then be cycled once to verify operation at this temperature.
- e. The security lid shall be temperature adjusted to and held at 110°F and 95% humidity for 15 minutes. The locking mechanism shall then be cycled once to verify operation at this temperature and humidity.

#### **9-29.2(5)C Standard Duty Non-Concrete Junction Boxes**

Non-concrete Junction Boxes shall be tested as defined in the ANSI/SCTE 77 Tier 15 test method using the test load of 22,500 pounds (minimum) in place of the design load during testing. In addition, the Contractor shall provide a Manufacturer Certificate of Compliance for each non-concrete junction box installed.

#### **9-29.2(5)D Heavy-Duty Boxes and Vaults**

Heavy-Duty Junction Boxes, Cable Vaults, and Pull Boxes shall be load tested to 46,000 pounds. The test load shall be applied vertically through a 10 by 20 by 1-inch steel plate centered on the lid with an orientation both on the long axis and the short axis of the junction box. The test load shall be applied and released ten times on each axis. The deflection at the test load and released state shall be recorded for each interval. At each interval the test box shall be inspected for lid deformation, failure of the lid or frame welds, vertical and horizontal displacement of the lid frame, cracks, and concrete spalling. After the twentieth loading interval the test shall be terminated with a 60,000 pound load being applied vertically through the steel plate centered on the lid and with the long edge of steel plate orientated parallel to the long axis of the box.

Heavy-Duty Junction Boxes will be considered to have withstood the 46,000 pound test if none of the following conditions are exhibited:

1. Permanent deformation of the lid or any impairment to the function of the lid.
2. Vertical or horizontal displacement of the lid frame.
3. Cracks wider than 0.012 inches that extend 12 inches or more.
4. Fracture or cracks passing through the entire thickness of the concrete.
5. Spalling of the concrete.

Heavy-Duty Junction Boxes will be considered to have withstood the 60,000 pound test if all of the following conditions are exhibited:

1. The lid is operational.
2. The lid is securely fastened.
3. The welds have not failed.
4. Permanent dishing or deformation of the lid is ¼ inch or less.
5. No buckling or collapse of the box.

1  
2 **9-29.2(1) Standard Duty and Heavy Duty Junction Boxes**

3 This section, including title, is revised to read:

4  
5 **9-29.2(1) Junction Boxes**

6 For the purposes of this Specification concrete is defined as portland cement concrete  
7 and non-concrete is all others.

8  
9 The Contractor shall provide shop drawings for all components, hardware, lid, frame,  
10 reinforcement, and box dimensions. The shop drawings shall be prepared by (or under  
11 the supervision of) a Professional Engineer, licensed under Title 18 RCW, State of  
12 Washington, in the branch of Civil or Structural. Each sheet shall carry the following:

- 13  
14 1. Professional Engineer's original signature, date of signature, original seal, and  
15 registration number. If a complete assembly drawing is included which  
16 references additional drawing numbers, including revision numbers for those  
17 drawings, then only the complete assembly drawing is required to be  
18 stamped.  
19  
20 2. The initials and dates of all participating design professionals.  
21  
22 3. Clear notation of all revisions including identification of who authorized the  
23 revision, who made the revision, and the date of the revision.  
24

25 Design calculations shall carry on the cover page, the Professional Engineer's original  
26 signature, date of signature, original seal, and registration number.

27  
28 For each type of junction box, or whenever there is a change to the junction box  
29 design, a proof test, as defined in this Specification, shall be performed and new shop  
30 drawings submitted.  
31

32 **9-29.2(1)A Standard Duty Junction Boxes**

33 This section is revised to read:

34  
35 Standard Duty Junction Boxes are defined as Type 1, 2 and 8 junction boxes and shall  
36 have a minimum load rating of 22,500 pounds and be tested in accordance with  
37 Section 9-29.2(5). A complete Type 8 Junction Box includes the spread footing shown  
38 in the Standard Plans. All Standard Duty Junction Boxes placed in sidewalks,  
39 walkways, and shared use paths shall have slip resistant surfaces. Non-slip lids and  
40 frames shall be hot dip galvanized in accordance with AASHTO M111.  
41

42 **9-29.2(1)A1 Concrete Junction Boxes**

43 The Standard Duty Concrete Junction Box steel frame, lid support, and lid shall be  
44 painted with a black paint containing rust inhibitors or painted with a shop applied,  
45 inorganic zinc primer in accordance with Section 6-07.3, or hot-dip galvanized in  
46 accordance with AASHTO M 111.  
47

48 Concrete used in Standard Duty Junction Boxes shall have a minimum  
49 compressive strength of 6,000 psi when reinforced with a welded wire hoop, or  
50 4,000 psi when reinforced with welded wire fabric or fiber reinforcement. The  
51 frame shall be anchored to the box by welding headed studs  $\frac{3}{8}$  by 3 inches long,

as specified in Section 9-06.15, to the frame. The wire fabric shall be attached to the studs and frame with standard tie practices. The box shall contain ten studs located near the centerline of the frame and box wall. The studs shall be placed one anchor in each corner, one at the middle of each width and two equally spaced on each length of the box.

Materials for Type 1, 2, and 8 Concrete Junction Boxes shall conform to the following:

| Materials                                         | Requirement                                                                                                                  |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Concrete                                          | <a href="#">Section 6-02</a>                                                                                                 |
| Reinforcing Steel                                 | <a href="#">Section 9-07</a>                                                                                                 |
| Fiber Reinforcing                                 | ASTM C1116, Type III                                                                                                         |
| Lid                                               | ASTM A786 diamond plate steel                                                                                                |
| Slip Resistant Lid                                | ASTM A36 steel                                                                                                               |
| Frame                                             | ASTM A786 diamond plate steel or ASTM A36 steel                                                                              |
| Slip Resistant Frame                              | ASTM A36 steel                                                                                                               |
| Lid Support                                       | ASTM A36 steel, or ASTM A1011 SS Grade 36 (or higher)                                                                        |
| Handle & Handle support                           | ASTM A36 steel, or ASTM A1011 CS (Any Grade) or SS (Any Grade)                                                               |
| Anchors (studs)                                   | <a href="#">Section 9-06.15</a>                                                                                              |
| Bolts, Studs, Nuts, Washers                       | ASTM F593 or A193, Type 304 or 316, or Stainless Steel grade 302, 304, or 316 steel in accordance with approved shop drawing |
| Locking and Latching Mechanism Hardware and Bolts | In accordance with approved shop drawings                                                                                    |

#### **9-29.2(1)A2 Non-Concrete Junction Boxes**

Material for the non-concrete junction boxes shall be of a quality that will provide for a similar life expectancy as portland cement concrete in a direct burial application.

Type 1, 2, and 8 non-concrete junction boxes shall have a Design Load of 22,500 pounds and shall be tested in accordance with Section 9-29.2(5). Non-concrete junction boxes shall be gray in color and have an open bottom design with approximately the same inside dimensions, and present a load to the bearing surface that is less than or equal to the loading presented by the concrete junction boxes shown in the Standard Plans. Non-concrete junction box lids shall include a pull slot and embedded 6 by 6 by ¼-inch steel plate, and shall be secured with two ½ inch stainless steel Penta-head bolts recessed into the cover. The tapped holes for the securing bolts shall extend completely through the box to prevent accumulation of debris. Bolts shall conform to ASTM F593, stainless steel.

1 **9-29.2(1)B Heavy-Duty Junction Boxes**

2 The first paragraph is revised to read:

3  
4 Heavy-Duty Junction Boxes are defined as Type 4, 5, and 6 junction boxes and shall  
5 be concrete and have a minimum vertical load rating of 46,000 pounds without  
6 permanent deformation and 60,000 pounds without failure when tested in accordance  
7 with Section 9-29.2(5).  
8

9 **9-29.2(1)C Testing Requirements**

10 This section is deleted in its entirety.

11  
12 **9-29.2(2) Small Cable Vaults, Standard Duty Cable Vaults, Standard Duty Pull**  
13 **Boxes, and Heavy Duty Pull Boxes**

14 This section, including title, is revised to read:

15  
16 **9-29.2(2) Cable Vaults and Pull Boxes**

17 Cable Vaults and Pull Boxes shall be constructed as a concrete box and as a concrete  
18 lid. The lids for Cable Vaults and Pull Boxes shall be interchangeable and both shall fit  
19 the same box as shown in the Standard Plans.  
20

21 The Contractor shall provide shop drawings for all components, including concrete box,  
22 Cast Iron Ring, Ductile Iron Lid, Steel Rings, and Lid. In addition, the shop drawings  
23 shall show placement of reinforcing steel, knock outs, and any other appurtenances.  
24 The shop drawing shall be prepared by or under the direct supervision of a  
25 Professional Engineer, licensed under Title 18 RCW, State of Washington, in the  
26 branch of Civil or Structural. Each sheet shall carry the following:  
27

- 28 1. Professional Engineer's original signature, date of signature, original seal, and  
29 registration number. If a complete assembly drawing is included which  
30 references additional drawing numbers, including revision numbers for those  
31 drawings, then only the complete assembly drawing is required to be  
32 stamped.  
33  
34 2. The initials and dates of all participating design professionals.  
35  
36 3. Clear notation of all revisions including identification of who authorized the  
37 revision, who made the revision, and the date of the revision.  
38

39 Design calculations shall carry on the cover page, the Professional Engineer's original  
40 signature, date of signature, original seal, and registration number.  
41

42 For each type of box or whenever there is a change to the Cable Vault or Pull box  
43 design, a proof test, as defined in this Specification, shall be performed and new shop  
44 drawings submitted.  
45

1 **9-29.2(2)A Small Cable Vaults, Standard Duty Cable Vaults, and Standard**  
2 **Duty Pull Boxes**

3 This section's title is revised to read:

4  
5 **9-29.2(2)A Standard Duty Cable Vaults and Pull Boxes**  
6

7 The first paragraph is revised to read:

8  
9 Standard Duty Cable Vaults and Pull Boxes shall be concrete and have a minimum  
10 load rating of 22,500 pounds and be tested in accordance with Section 9-29.2(5). For  
11 the purposes of this Section, Small Cable Vaults are considered a type of Standard  
12 Duty Cable Vault.  
13

14 The first sentence of the second paragraph is revised to read:

15  
16 Concrete for Standard Duty Cable Vaults and Pull Boxes shall have a minimum  
17 compressive strength of 4,000 psi.  
18

19 The first sentence of the third paragraph is revised to read:

20  
21 All Standard Duty Cable Vaults and Pull Boxes placed in sidewalks, walkways, and  
22 shared-use paths shall have slip-resistant surfaces.  
23

24 The fourth paragraph (up until the colon) is revised to read:

25  
26 Materials for Standard Duty Cable Vaults and Pull Boxes shall conform to the following:  
27

28 **9-29.2(2)B Heavy-Duty Cable Vaults and Pull Boxes**

29 The first paragraph is revised to read:

30  
31 Heavy-Duty Cable Vaults and Pull Boxes shall be constructed of concrete having a  
32 minimum compressive strength of 4,000 psi, and have a minimum vertical load rating of  
33 46,000 pounds without permanent deformation and 60,000 pounds without failure when  
34 tested in accordance with Section 9-29.2(5).  
35

36 **9-29.2(3) Structure Mounted Junction Boxes**

37 The first and second paragraphs are revised to read:

38  
39 Surface mounted junction boxes and concrete embedded junction boxes installed in  
40 cast-in-place structures shall be stainless steel NEMA 4X.  
41

42 Concrete embedded junction boxes installed in structures constructed by slip forming  
43 shall be stainless steel NEMA 3R and shall be adjustable for depth, with depth  
44 adjustment bolts, which are accessible from the front face of the junction box with the  
45 lid installed.  
46



### 9-29.3(1) Fiber Optic Cable

This section is revised to read:

All fiber optic cables shall be single mode fiber optic cables unless otherwise specified in the Contract. All fiber optic cables shall meet the following requirements:

1. Compliance with the current version of ANSI/ICEA S-87-640. A product data specification sheet clearly identifying compliance or a separate letter from manufacturer to state compliance shall be provided.
2. Cables shall be gel free, loose tube, low water peak, and all dielectric with no metallic component.
3. Cables shall not be armored unless specified in the Contract.
4. Cables shall be approved for mid-span entries and be rated by the manufacturer for outside plant (OSP) use, placement in underground ducts, and aerial installations.
5. Fiber counts shall be as specified in the Contract.
6. Fibers and buffer tubes shall be color coded in accordance with the current version of EIA/TIA-598.
7. Fibers shall not have any factory splices.
8. Outer Jacket shall be Type M (Medium Density Polyethylene). Outer jacket shall be free from holes, splits, blisters, or other imperfections and must be smooth and concentric as is consistent with the best commercial practice.
9. A minimum of one (1) rip cord is required for each cable.
10. Cable markings shall meet the following additional requirements:
  - a. Color shall be white or silver.
  - b. Markings shall be approximately 3 millimeters (118 mils) in height, and dimensioned and spaced to produce good legibility.
  - c. Markings shall include the manufacturer's name, year of manufacture, the number of fibers, the words "OPTICAL CABLE", and sequential length marks.
  - d. Sequential length markings shall be in meters or feet, spaced at intervals not more than 1 meter or 2 feet apart, respectively.
  - e. The actual cable length shall not be shorter than the cable length marking. The actual cable length may be up to 1% longer than the cable length marking.
  - f. Cables with initial markings that do not meet these requirements will not be accepted and may not be re-marked.

- 1 11. Short term tensile strength shall be a minimum of 600 pounds (1bs). Long  
2 term tensile strength shall be a minimum of 180 pounds (1bs). Tensile  
3 strength shall be achieved using a fiberglass reinforced plastic (FRP) central  
4 member and / or aramid yarns.  
5  
6 12. All cables shall be new and free of material or manufacturing defects and  
7 dimensional non-uniformity that would:  
8  
9 a. Interfere with the cable installation using accepted cable installation  
10 practices;  
11  
12 b. Degrade the transmission performance or environmental resistance after  
13 installation;  
14  
15 c. Inhibit proper connection to interfacing elements;  
16  
17 d. Otherwise yield an inferior product.  
18  
19 13. The fiber optic cables shall be shipped on reels with a drum diameter at least  
20 20 times the diameter of the cable, in order to prevent damage to the cable.  
21 The reels shall be substantial and constructed so as to prevent damage  
22 during shipment and handling. Reels shall be labeled with the same  
23 information required for the cable markings, with the exception that the total  
24 length of cable shall be marked instead of incremental length marks. Reels  
25 shall also be labeled with the type of cable.  
26

27 This section is supplemented with the following new subsection:  
28

29 **9-29.3(1)B Multimode Optical Fibers**

30 Where multimode fiber optic cables are specified in the Contract, the optical fibers shall  
31 be one of the following types, as specified in the Contract:  
32

- 33 a. Type OM1, meeting the requirements of EIA/TIA 492-AAAA-A or ISO/IEC  
34 11801. The fiber core diameter shall be 62.5 µm.  
35  
36 b. Type OM2, meeting the requirements of EIA/TIA 492-AAAB-A or ISO/IEC  
37 11801. The fiber core diameter shall be 50 µm.  
38

39 All multimode optical fibers shall have a maximum attenuation of 3.0 dB/km at 850nm  
40 and 1.0 dB/km at 1300nm. Completed cable assemblies shall be rated for 1000BaseLX  
41 Ethernet communications.  
42

43 **9-29.3(1)A Singlemode Fiber Optic Cable**

44 This section is revised to read:  
45

46 Single-Mode optical fibers shall be EIA/TIA 492-CAAB or ISO/IEC 11801 Type OS2,  
47 low water peak zero dispersion fibers, meeting the requirements of ITU-T G.652.D.  
48

## 9-29.6 Light and Signal Standards

The third paragraph is revised to read:

Light standard, signal standards, slip base hardware and foundation hardware shall be hot dip galvanized in accordance with AASHTO M 111 and AASHTO M 232. Where colored standards are required, standards shall be powder-coated after galvanizing in accordance with Section 6-07.3(11). The standard color shall be as specified in the Contract.

### 9-29.6(1) Steel Light and Signal Standards

In the first paragraph, "ASTM A325" is revised to read "ASTM F3125 Grade A325".

### 9-29.6(2) Slip Base Hardware

In this section, "ASTM A325" is revised to read "ASTM F3125 Grade A325".

### 9-29.7(2) Fused Quick-Disconnect Kits

The table is supplemented with the following new row:

|      |     |     |     |
|------|-----|-----|-----|
| LED* | 10A | 10A | 20A |
|------|-----|-----|-----|

The following footnote is inserted after the table:

- \* Applies to all LED luminaires, regardless of wattage. Fuses for LED luminaires shall be slow blow.

## 9-29.10 Luminaires

The first sentence of the third paragraph is revised to read:

All luminaires shall be provided with markers for positive identification of light source type and wattage in accordance with ANSI C136.15-2011, with the exception that LED luminaires shall be labeled with the wattage of their conventional luminaire equivalents – the text "LED" is optional.

The table in the fourth paragraph is revised to read:

| Conventional Lamp Wattage | Conventional Wattage Legend | Equivalent LED Legend |
|---------------------------|-----------------------------|-----------------------|
| 70                        | 7                           | 7E                    |
| 100                       | 10                          | 10E                   |
| 150                       | 15                          | 15E                   |
| 175                       | 17                          | 17E                   |
| 200                       | 20                          | 20E                   |
| 250                       | 25                          | 25E                   |
| 310                       | 31                          | 31E                   |
| 400                       | 40                          | 40E                   |
| 700                       | 70                          | 70E                   |
| 750                       | 75                          | 75E                   |
| 1,000                     | X1                          | X1E                   |

1 **9-29.13(10)C NEMA Controller Cabinets**

2 Item number 6 of the first paragraph is revised to read:

- 3
- 4 6. LED light strips shall be provided for cabinet lighting. Each LED light strip shall be
- 5 approximately 12 inches long, have a minimum output of 320 lumens, and have a
- 6 color temperature of 4100K (cool white) or higher. Two light strips shall be
- 7 provided. One light strip shall be ceiling mounted and oriented parallel to the door
- 8 face. The second light strip shall be mounted under the lower shelf, such that the
- 9 output terminal landings are illuminated. Lighting shall not interfere with the proper
- 10 operation of any other ceiling or shelf mounted equipment. All lighting fixtures shall
- 11 energize automatically when any door is opened. Each door switch shall be
- 12 labeled "Light".
- 13

14 **9-29.13(10)D Cabinets for Type 170E and 2070 Controllers**

15 Item number 6 of the first paragraph is revised to read:

- 16
- 17 6. LED light strips shall be provided for cabinet lighting, powered from the Equipment
- 18 breaker on the Power Distribution Assembly. Each LED light strip shall be
- 19 approximately 12 inches long, have a minimum output of 320 lumens, and have a
- 20 color temperature of 4100K (cool white) or higher. There shall be two light strips
- 21 for each rack within the cabinet. Lighting shall be ceiling mounted – rack mounted
- 22 lighting is not permitted. One light strip shall be installed above the front of the
- 23 rack, oriented parallel to the door face, and placed such that the front of the rack
- 24 and the rack mounted equipment is illuminated. The second light strip shall be
- 25 installed above the rear of the rack, oriented perpendicular to the door face, and
- 26 placed such that the interior of the rack is illuminated. Lighting shall not interfere
- 27 with the proper operation of any other ceiling mounted equipment. All lighting
- 28 fixtures above a rack shall energize automatically when either door to that
- 29 respective rack is opened. Each door switch shall be labeled "Light".
- 30

31 **9-29.13(12) ITS Cabinet**

32 Item number 6 of the first paragraph is revised to read:

- 33
- 34 6. LED light strips shall be provided for cabinet lighting, powered from the Equipment
- 35 breaker on the Power Distribution Assembly. Each LED light strip shall be
- 36 approximately 12 inches long, have a minimum output of 320 lumens, and have a
- 37 color temperature of 4100K (cool white) or higher. There shall be two light strips
- 38 for each rack within the cabinet. Lighting shall be ceiling mounted – rack mounted
- 39 lighting is not permitted. One light strip shall be installed above the front of the
- 40 rack, oriented parallel to the door face, and placed such that the front of the rack
- 41 and the rack mounted equipment is illuminated. The second light strip shall be
- 42 installed above the rear of the rack, oriented perpendicular to the door face, and
- 43 placed such that the interior of the rack is illuminated. Lighting shall not interfere
- 44 with the proper operation of any other ceiling mounted equipment. All lighting
- 45 fixtures above a rack shall energize automatically when either door to that
- 46 respective rack is opened. Each door switch shall be labeled "Light".
- 47

## **9-29.25 Amplifier, Transformer, and Terminal Cabinets**

Item 2C is revised to read:

|    |                            |     |     |     |
|----|----------------------------|-----|-----|-----|
| c. | Transformer up to 12.5 KVA | 20" | 48" | 24" |
|    | Transformer 12.6 to 35 KVA | 30" | 60" | 32" |

The following new sentence is inserted before the last sentence of item number 10:

There shall be an isolation breaker on the input (line) side of the transformer, and a breaker array on the output (load) side.

9-30.AP9

## **Section 9-30, Water Distribution Materials**

**August 7, 2017**

### **9-30.6(3) Service Pipes**

This section is supplemented with the following new subsection:

#### **9-30.6(3)C PEX-a Tubing**

PEX-a tubing shall be a minimum of ¾-inch or a maximum 2-inch in diameter and shall be manufactured in accordance with AWWA C904 and ASTM F876. The tubing shall have a minimum materials designation code of 3306 in accordance with ASTM F876, a pressure rating of 200 psi at 73.4 degrees using a design factor of 0.63 as outlined in PPI TR-3, Part F-7, and shall have a minimum SDR of 9. Tubing color shall be blue in accordance with APWA Uniform color standards.

### **9-30.6(4) Service Fittings**

This section is supplemented with the following new paragraph:

Fittings for PEX-a tubing shall meet the requirements of AWWA C904.

9-31.AP9

## **Section 9-31, Elastomeric Pads**

**August 7, 2017**

This section, including title, is revised to read:

### **9-31 Fabricated Bridge Bearing Assemblies**

#### **9-31.1 Steel Plates and Bars**

Steel plates and bars, including anchor array templates, shall conform to ASTM A 36.

Recessed steel surfaces retaining PTFE shall have an average surface roughness of 250-microinches or less.

Steel surfaces in contact with pre-formed fabric pad or polyether urethane disc shall have an average surface roughness of 250-microinches or less.

Steel surfaces in contact with stainless steel sheet, or with the bearing block of a pin bearing assembly, shall have an average surface roughness of 125-microinches or less.

All other steel surfaces in contact with other fabricated bridge bearing assembly components shall have an average surface roughness of 250-microinches or less.

### **9-31.2 Stainless Steel**

Stainless steel sheet shall conform to ASTM A 240 Type 304L. Stainless steel in contact with PTFE shall be polished to a Number 8 mirror finish. Stainless steel sheet for fabric pad bearing assemblies shall have a thickness greater than or equal to 14-gage.

Stainless steel countersunk screws shall be hexagon socket type conforming to the geometric requirements of ANSI B 18.3 and shall conform to ASTM F 593 Type 304L.

### **9-31.3 Bearing Blocks and Keeper Rings**

Bearing block forgings for pin bearing assemblies shall conform to Section 9-06.11, including AASHTO M 102 Supplemental Requirement S4. The grade shall be Grade F. The bearing block forging surfaces in contact with other pin bearing assembly components shall have an average surface roughness of 63-microinches or less. All other bearing block forging surfaces shall have an average surface roughness of 250-microinches or less.

Keeper ring forgings for pin bearing assemblies shall conform to Section 9-06.11, and the grade shall be Grade H. All keeper ring surfaces shall have an average surface roughness of 125-microinches or less.

### **9-31.4 Pin Assembly**

Pins shall conform to ASTM A 276 UNS Designation 21800. The pin surfaces in contact with the bearing block shall have an average surface roughness of 63-microinches or less.

Nuts shall conform to ASTM A 563 Grade DH. Nuts with a thread diameter equal to or less than six-inches shall have a minimum Rockwell Hardness of HRc 24. Nuts with a thread diameter greater than six-inches shall have a Rockwell Hardness between HRc 20 and HRc 30.

Washers shall conform to ASTM A 572 Grade 50.

Cotter pins shall be stainless steel.

### **9-31.5 Welded Shear Connectors**

Welded shear connectors shall conform to Section 9-06.15.

### **9-31.6 Bolts, Nuts and Washers**

Bolts, nuts and washers shall conform to Section 9-06.5(3).

### 9-31.7 Anchor Array Rods, Nuts and Washers

Anchor array rods, nuts and washers shall conform to Section 9-06.5(4). The top 1'-0", minimum, of the exposed end of the anchor rods, and the associated nuts and washers, shall be galvanized in accordance with AASHTO M 232 or ASTM F 2329 as applicable.

Pipe sleeves for anchor array templates shall conform to ASTM A 53 Grade B Type E or S, black.

### 9-31.8 Bearing Pads

#### 9-31.8(1) Elastomeric Pads

Elastomeric pads shall conform to the requirements of AASHTO M251 unless otherwise specified in the Plans or Special Provisions. The elastomer shall be low-temperature Grade 3 and shall not contain any form of wax. Unless otherwise specified in the Plans or Special Provisions, the elastomer shall have a shear modulus of elasticity of 165 psi at 73°F.

All elastomeric pads with steel laminates shall be cast as units in separate molds and bonded and vulcanized under heat and pressure. Corners and edges of molded pads may be rounded at the option of the Contractor. Radius at corners shall not exceed  $\frac{3}{8}$  inch, and radius of edges shall not exceed  $\frac{1}{8}$  inch. Elastomeric pads shall be fabricated to meet the tolerances specified in AASHTO M251.

Shims contained in laminated elastomeric pads shall be mill rolled steel sheets not less than 20 gage in thickness with a minimum cover of elastomer on all edges of:

$\frac{1}{4}$  inch for pads less than or equal to 5 inches thick and,

$\frac{1}{2}$  inch for pads greater than 5 inches thick.

Steel shims shall conform to ASTM A1011, Grade 36, unless otherwise noted. All shim edges shall be ground or otherwise treated so that no sharp edges remain.

#### 9-31.8(2) Polytetrafluoroethylene (PTFE)

PTFE shall be unfilled (100-percent virgin) PTFE or fiberglass fiber filled PTFE (or woven fabric PTFE for disc or spherical bearing assemblies) conforming to Section 18.8 of the AASHTO LRFD Bridge Construction Specifications, and the following additional requirements:

1. PTFE shall be unfilled (100-percent virgin) PTFE except where filled PTFE is specified in the Plans.
2. Filled PTFE shall be composed of PTFE resin uniformly blended with 15-percent maximum fiberglass fiber.
3. The substrate shall limit the flow (elongation) of the confined PTFE to not more than 0.009-inch under a pressure of 2,000 psi for 15-minutes at 78°F for a two-inch by three-inch test sample.

4. Unfilled PTFE shall have a hardness of 50 to 65 Durometer D, at 78°F, in accordance with ASTM D 2240.

5. The PTFE may be dimpled.

### **9-31.8(3) Pre-Formed Fabric Pad**

Pre-formed fabric pads shall be composed of multiple layers of duck, impregnated and bound with high-quality oil resistant synthetic rubber, compressed into resilient pads. The pre-formed fabric pads shall conform to MIL C 882 and the following additional requirements:

1. The pre-formed fabric pad shall have a shore A hardness of  $90 \pm 5$  in accordance with ASTM D 2240.
2. The number of plies shall be as required to produce the specified thickness after compression and vulcanization.

### **9-31.9 Polyether Urethane**

Polyether urethane shall be a molded polyether urethane compound conforming to the following properties:

| <b>Physical Properties</b>                                    | <b>Specification</b> |     |     |     |
|---------------------------------------------------------------|----------------------|-----|-----|-----|
| Hardness, Type D durometer                                    | ASTM D 2240          | 45  | 55  | 65  |
| Minimum tensile stress, ksi                                   | ASTM D 412           |     |     |     |
| At 100-percent elongation                                     |                      | 1.5 | 1.9 | 2.3 |
| At 200-percent elongation                                     |                      | 2.8 | 3.4 | 4.0 |
| Minimum tensile strength, ksi                                 | ASTM D 412           | 4.0 | 5.0 | 6.0 |
| Minimum ultimate elongation, percent                          | ASTM D 412           | 350 | 285 | 220 |
| Maximum compression set (22 hours at 158°F) Method B, percent | ASTM D 395           | 40  | 40  | 40  |

Required minimums for tensile stress at specific elongations, tensile strength, ultimate elongation, and compression set may be interpolated for durometer hardness values between 45 and 55, and 55 and 65.

### **9-31.10 Silicone Grease**

Silicone grease for use with dimpled PTFE shall conform to SAE AS 8660.

### **9-31.11 Epoxy Gel**

Epoxy gel shall be Type 1, Grade 3, Class A, B, or C, conforming to Section 9-26.1.



1           **9-31.12 Resin Filler**

2           Resin filler shall be a two-component, resin and catalyst, liquid thermoset material,  
3           with the following properties:

- 4
- 5           1.   The viscosity of the resin-catalyst mixture shall be 35,000 ± 5,000cP at  
6               75°F immediately after mixing.
  - 7
  - 8           2.   The flash point shall be 100°F minimum.
  - 9
  - 10          3.   After mixing, the resin-catalyst mixture shall be pourable for a minimum of  
11               8-minutes at 60°F and shall harden in 15-minutes maximum. Heating of  
12               the mixture to a maximum temperature of 250°F after placement is  
13               permissible to obtain a full cure.
  - 14

15          The properties of the cured resin-catalyst mixture shall be:

- 16
- 17          1.   The fully cured compressive strength shall be 12,000 psi, minimum.
  - 18
  - 19          2.   The maximum allowable shrinkage shall be 2-percent. To control  
20               shrinkage, an inert filler may be used in the resin provided the specified  
21               viscosity requirements are met.
  - 22
  - 23          3.   The hardness shall be between 40 and 55 in accordance with  
24               ASTM D 2583.
  - 25

26          The resin and catalyst components shall be supplied in separate containers.

27

28          9-35.AP9

29          **Section 9-35, Temporary Traffic Control Materials**  
30          **August 7, 2017**

31          **9-35.12 Transportable Attenuator**

32          The second sentence of the first paragraph is revised to read:

33

34               The transportable attenuator shall be mounted on, or attached to, a host vehicle that  
35               complies with the manufacturer's recommended weight range.

36

37          **9-35.14 Portable Temporary Traffic Control Signal**

38          The last sentence of the eighth paragraph is revised to read:

39

40               A highly retroreflective yellow strip, 1 inch wide, shall be placed around the perimeter of  
41               the face of all vehicle signal backplates to project a rectangular image at night toward  
42               oncoming traffic.

## Special Provisions



## **SPECIAL PROVISIONS**

The work on this project shall be accomplished in accordance with the Standard Specifications for Road, Bridge and Municipal Construction, 2016 edition, as issued by the Washington State Department of Transportation (WSDOT), Washington State Chapter (hereafter “Standard Specifications”). The Standard Specifications, as modified or supplemented by the Amendments to the Standard Specifications and these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

These Special Provisions are made up of both General Special Provisions (GSPs) from various sources, which may have project-specific fill-ins; and project-specific Special Provisions. Each Provision either supplements, modifies, or replaces the comparable Standard Specification, or is a new Provision. The deletion, amendment, alteration, or addition to any subsection or portion of the Standard Specifications is meant to pertain only to that particular portion of the section, and in no way should it be interpreted that the balance of the section does not apply.

The project-specific Special Provisions are not labeled as such. The GSPs are labeled under the headers of each GSP, with the date of the GSP and its source, as follows:

*(April 2, 2007 WSDOT GSP)*

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## DIVISION 1

### GENERAL REQUIREMENTS

#### 1-01 DEFINITIONS AND TERMS

##### 1-01.3 Definitions

Section 1-01.3 is supplemented with the following:

All references in these Contract Documents and the Standard Specifications to the terms “State”, “Department of Transportation”, “Washington State Transportation Commission”, “Commission”, “Secretary of Transportation”, “Secretary”, “Headquarters”, “State Treasurer”, “Contracting Agency”, and “Owner”, shall be revised to read “The Tulalip Tribes”. The Tulalip Tribes will designate as Construction Manager the individual(s) with authority to administer and implement the terms and conditions of the agreement.

All references to “State Materials Laboratory” shall be revised to read “Contracting Agency designated location”.

##### **Alternative**

A supplemental unit of work or group of bid items, identified separately in the proposal, which may, at the discretion of the Contracting Agency, be awarded in addition to the base bid.

##### **Contract Documents**

See definition for “Contract”.

##### **Contract Time**

The period of time established by the terms and conditions of the contract within which the work must be physically completed.

##### **Dates**

###### ***Bid Opening Date***

The date on which the Contracting Agency publicly opens and reads the bids.

###### ***Award Date***

The date of the formal decision of the Contracting Agency to accept the lowest responsible and responsive bidder for the work.

###### ***Contract Execution Date***

The date the Contracting Agency officially binds the agency to the contract.

###### ***Notice to Proceed Date***

The date stated in the Notice to Proceed on which the contract time begins.

###### ***Substantial Completion Date***

The day the Engineer determines the Contracting Agency has full and unrestricted use and benefit of the facilities, both from the operational and safety standpoint, and only minor incidental work, replacement of temporary substitute facilities, or correction or repair remains for the physical completion of the total contract.

**Physical Completion Date**

The day all of the work is physically completed on the project. All documentation required by the contract and required by law does not necessarily need to be furnished by the Contractor by this date.

**Completion Date**

The day all the work specified in the contract is completed and all the obligations of the Contractor under the contract are fulfilled by the Contractor. All documentation required by the contract and required by law must be furnished by the Contractor before establishment of this date.

**Final Acceptance Date**

The date on which the Contracting Agency accepts the work as complete.

**Engineer's Orders**

The term "Engineer's orders" is synonymous with "directive", "field order" and "field directive".

**NAOB or NAOB's**

Native American Owned Business that has been certified by Tulalip TERO.

**Notice of Award**

The written notice from the Contracting Agency to the successful bidder signifying the Contracting Agency's acceptance of the bid.

**Notice to Proceed**

The written notice from the Contracting Agency or Engineer to the Contractor authorizing and directing the Contractor to proceed with the work and establishing the date on which the contract time begins.

**Preference / Preferred Employee / Hiring**

The term "Preferred Employee" shall mean a person entitled to a preference in employment under Ordinance No. 60, who must be hired in tier preference order before a non-Indian person, whenever an opening is available.

**Reservation**

Shall mean all lands and waters within the exterior boundaries of the Tulalip Indian Reservation or within the jurisdiction of the Tulalip Tribes.

**TERO**

Means the "Tulalip Tribal Employment Rights Office".

**Traffic**

Both vehicular and non-vehicular traffic, such as pedestrians, bicyclists, wheelchairs, and equestrian traffic.

**Tribal Court**

Shall mean the tribal court of the Tulalip Tribes of Washington.

**Tribal Entity**

Means all subsidiary entities of the Tulalip Tribes and is intended to be as broad and encompassing as possible to ensure the Ordinance's coverage overall employment and

contract activities within the Nation's jurisdiction and the term shall be so interpreted by the Commission and the Courts.

**Tribal Preference**

This is the process of hiring applicants which gives tribal members a higher preference in employment on tribally funded projects or tribal entities.

**Tribal Member**

The term "Tribal Member" and the term "Member" shall mean any person who is an enrolled member of the Tulalip Tribes.

**Tribe**

The term "Tribe" or "Tribes" shall mean the Tulalip Tribes of Washington, unless the context clearly indicates otherwise.

**Tulalip TERO Code**

The Tulalip "Tribal Employment Rights Office" (TERO) Code is the Tribal law which establishes the methods and procedures to give preference to Indians in hiring promotions, training and all other aspects of employment contracting and subcontracting and specifies the methods and procedures for providing preference to certified NAOBs when contracting and subcontracting for goods or services on the Reservation.

**Tulalip Tribes of Washington**

The Contracting Agency, Owner or entity for whom the Project is being constructed.

**Tulalip Tribes**

See Tulalip Tribes of Washington.

**Tulalip Tribes' Project Manager**

The Tulalip Tribes' representative who provides management and oversight for the project.

**1-02 BID PROCEDURES AND CONDITIONS**

**1-02.2 Plans and Specifications**

Section 1-02.2 is replaced with the following:

Information as to where Bid Documents can be obtained or reviewed will be found in the Call for Bids (Advertisement for Bids) for the work.

After award of the contract, plans and specifications will be issued to the Contractor at no cost as detailed below:

| <b>To Prime Contractor</b>                          | <b>No. of Sets</b> | <b>Basis of Distribution</b>        |
|-----------------------------------------------------|--------------------|-------------------------------------|
| Reduced plans (11"x17") and Contract Provisions     | 4                  | Furnished automatically upon award. |
| Large plans (e.g., 22"x34") and Contract Provisions | 2                  | Furnished only upon request.        |

Additional Plans and Contract Provisions may be purchased for a non-refundable charge at Bill's Blueprint, Inc., 2920 Rockefeller Avenue, Everett, Washington 98201, Phone: (425) 259-0859.

#### **1-02.4 Examination of Plans, Specifications, and Site of Work**

Section 1-02.4 is supplemented with the following:

The soils information used for study and design of this project is available in the Appendix to the Contract Documents.

#### **1-02.6 Preparation of Proposal**

Section 1-02.6 is supplemented with the following:

##### **Bid Proposal**

This Bid Proposal requires the bidder to bid on one (single) proposal form. The bid proposal is composed of the following parts:

1. Proposal for MBR Treatment Facility Upgrade Project.

##### **Bidding Procedures**

To be considered responsive the bidder shall submit a price on each and every item of work included in the Proposal.

##### **Award Procedures**

The successful bidder will be the bidder submitting the most responsive and responsible bid for the total for Proposal MBR Treatment Facility Upgrade (Base Schedule of Prices). Award will be subject to the requirements of Section 1-03 and the "Bid Evaluation Procedure" under Consideration of Bids.

#### **1-02.7 Bid Deposit**

Section 1-02.7 is supplemented with the following:

The Proposal Bond shall be in hard copy only.



## **1-02.12 Public Opening of Proposals**

Section 1-02.12 is supplemented with the following:

### **Date of Opening Bids**

Sealed bids are to be received at the following location prior to the time Specified:

1. At The Quil Ceda Village Administration Office, 8802 27th Avenue NE, Tulalip, Washington 98271-9694.

The bid opening date for this project is 2:00 p.m. local time on the date shown in Advertisement for Bids, LD-1. Bids received will be opened and read after the published time and date in the Conference Room at the Quil Ceda Village Administration Office. Bidders, their authorized agents, and other interested parties are invited to be present.

## **1-03 AWARD AND EXECUTION OF CONTRACT**

### **1-03.2 Award of Contract**

Section 1-03.2 is supplemented with the following:

The successful bidder will be the bidder submitting the most responsive and responsible bid (with corrections if necessary per Section 1-03.1) as outlined in the "Bid Evaluation Procedure" under Consideration of Bids for Proposal (MBR Treatment Facility Upgrade). Award will be subject to the requirements of Section 1-03 and the "Bid Evaluation Procedure" under Consideration of Bids.

The Contracting Agency reserves the right to Award any or all of the Proposals to the most responsive and responsible bidder.

### **1-03.4 Contract Bond**

Section 1-03.4 is supplemented with the following:

The Contract Bond shall stay in affect for one (1) calendar year after final completion and acceptance of the Work.

## **1-04 SCOPE OF THE WORK**

### **1-04.2 Coordination of Contract Documents, Plans, Special Provisions, Specifications, and Addenda**

The second paragraph of Section 1-04.2 is revised as follows:

Any inconsistency in the parts of the contract shall be resolved by following this order of precedence (e.g., 1 presiding over 2, 2 over 3, 3 over 4, and so forth):

1. Addenda.
2. Proposal Form.

3. Contract Agreement
4. General Provisions.
5. General Requirements and Special Provisions, thereto, including WSDOT General Special Provisions, if they are included.
6. Technical Specifications.
7. Contract Plans.
8. 2016 WSDOT Standard Specifications for Road, Bridge, and Municipal Construction as amended complete.
9. Contracting Agency's Standard Plans (if any).
10. WSDOT Standard Plans for Road, Bridge, and Municipal Construction.

#### **1-04.4 Changes**

Replace the first sentence of the sixth paragraph of Section 1-04.4 with the following:

For any changes except Item 1 (deleted Work) or Item 2 (increasing or decreasing quantities), the Engineer will determine if the change should be paid for at unit Contract prices(s) based on the contract bid items. If the Engineer orders the work to be completed and the work is to be completed under unit Contract price(s) based on the contract bid items, a change order will not be required.

##### **1-04.4(1) Minor Changes**

The first paragraph of Section 1-04.4(1) is replaced with the following:

Payments or credits for changes amounting to \$10,000 or less may be made under the bid item "Minor Change." At the discretion of the Contracting Agency, this procedure for Minor Changes may be used in lieu of the more formal procedure as outlined in Section 1-04.4, Changes.

#### **1-04.5 Procedure and Protest by the Contractor**

The second to the last paragraph of Section 1-04.5 is replaced with the following:

If the Contractor does not accept the Engineer's determination then the Contractor shall pursue the dispute and claims procedures set forth in Section Thirteen of the Agreement. In spite of any protest or dispute, the Contractor shall proceed promptly with the Work as the Engineer orders.

### **1-05 CONTROL OF WORK**

#### **1-05.1 Authority of the Engineer**

The first sentence of the third paragraph of Section 1-05.1 is replaced with the following:

The Project Engineer represents the Engineer on the project, with full authority to enforce Contract requirements and carry out the Engineer's orders (Orders, Directive, Field Order, or Field Directive).

Add the following new section:

#### **1-05.5 Record Drawings**

#### **New Section**

At the close of the project, the Contractor shall furnish to the Engineer one complete set of record drawings. The record drawings shall include all material installed by the Contractor regardless of proposal. Record drawings shall be legible redline markups showing all as-constructed revisions from the original Plans and Specifications. Plans will also identify any existing underground utilities not shown on the Plans and encountered during the construction. The Contractor shall keep redline markups current based upon the progress of the work. The Engineer may request periodic review of the record drawings to determine if all record drawing information is being documented. Should the Contractor not be keeping record drawings up to date the Owner may withhold monthly payments until such time as the record drawings are made current.

The Contractor shall provide the final record drawings within 10 calendar days after Notice of Substantial Completion.

#### **1-05.7 Removal of Defective and Unauthorized Work**

Section 1-05.7 is supplemented with the following:

The Contracting Agency will not pay for public or private property damage caused by the Contractor. At the Engineer's order, the Contractor shall immediately remedy, remove/dispose, replace, and restore damaged property and bear all costs for doing so.

#### **1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC**

##### **1-07.1 Laws to be Observed**

The first three paragraphs of Section 1-07.1 are revised to read:

The Contractor shall always comply with all Federal, State, Tribal, or local laws, ordinances, and regulations that affect Work under the Contract. The Contractor shall indemnify, defend, and save harmless The Tulalip Tribes (including its Board of Directors and all other officers and employees) and the State (including the Governor, Commission, Secretary, and any agents, officers, and employees) against any claims that may arise because the Contractor (or any employee of the Contractor or Subcontractor or material person) violated a legal requirement.

The Contractor shall be responsible to immediately report to the Engineer any deviation from the contract provisions pertaining to environmental compliance, including but not limited to spills, unauthorized fill in waters of the Tribes including wetlands, unauthorized fill in waters of the State including wetlands, water quality standards, noise, air quality, etc.

The Contractor shall be responsible for the safety of all workers and shall comply with all appropriate state safety and health standards, codes, rules, and regulations, including, but not limited to, those promulgated under the Washington Industry Safety and Health Act RCW 49.17 (WISHA) and as set forth in Title 296 WAC (Department of Labor and Industries). In particular the Contractor's attention is drawn to the requirements of WAC 296.800 which

requires employers to provide a safe workplace. More specifically WAC 296.800.11025 prohibits alcohol and narcotics from the workplace. The Contractor shall likewise be obligated to comply with all federal safety and health standards, codes, rules, and regulations that may be applicable to the Contract Work.

Section 1-07.1 is supplemented with the following:

### ***Indian Preference and Tribal Ordinances***

This project is located on the Tulalip Indian Reservation. It is the Contractor's responsibility to comply with all applicable Tribal laws, codes, ordinances, and regulations. The Contractor shall comply with them in accordance with Section 1-07.1. For informational purposes only, the Work on this project that falls within the Reservation is shown in the bid schedule in Group(s) Schedule A – TULALIP TRIBES, Schedule A - WSDOT (Within Reservation Boundary), Schedule B – WSDOT (outside the Reservation Boundary), Schedule C – Marysville, Schedule D – TULALIP TRIBES Utilities.

Tribal Employment Rights Ordinances (TEROs), may utilize a variety of tools to encourage Indian employment. These tools may include, but are not limited to, TERO fees, Indian hiring preference, Indian-owned business subcontracting preference and/or an Indian training requirement. Other requirements may be a Tribal business license, a required compliance plan and/or employee registration requirements. Every tribe is different and each may be willing to work cooperatively with the Contractor to develop a strategy that works for both parties. For specific details, the Contractor should contact The Tulalip Tribes' TERO Department at 6406 Marine Drive, Tulalip, Washington 98271, Office (360) 716-4747 or Facsimile (360) 716-0249. <http://www.tulaliptero.com/> .

The Tulalip Tribes of Washington has the sovereign authority over the lands of the Tulalip Indian Reservation and has the authority to enact and enforce its laws, ordinances codes and regulations. The Contractor shall comply and cooperate with the Tribes and its representatives. The costs related to such compliance shall be borne solely by the Contractor, who is advised to contact the tribal representative listed above, prior to submitting a bid, to assess the impact of compliance on the project.

Although Indian preference can be compelled and mandated by the Contracting Agency, there is no limitation whereby voluntary Contractor or Subcontractor initiated preferences are given, if otherwise lawful. 41 CFR 60-1.5(a)7 provides as follows:

Work on or near Indian reservations --- It shall not be a violation of the equal opportunity clause for a construction or non-construction Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation in connection with employment opportunities on or near an Indian reservation. The use of the word near would include all that area where a person seeking employment could reasonably be expected to commute to and from in the course of a work day. Contractors or Subcontractors extending such a preference shall not, however, discriminate among Indians on the basis of religion, sex, or tribal affiliation, and the use of such a preference shall not excuse a Contractor from complying with the other requirements as contained in the August 25, 1981 Department of Labor, Office of Federal Contract Compliance Programs, Government Contractors Affirmative Actions Requirements.

TERO Participation shall be evaluated as follows:

Counting Tulalip Tribal Member Native American Owned Business or Native American Owned Business Participation

When a Tulalip Tribal Member NAOB or NAOB participates in a contract, only the value of the work actually performed by the Tulalip Tribal Member NAOB or NAOB will be counted towards the Tulalip Tribal Member NAOB or NAOB subcontracting requirement.

1. Count the entire amount of the portion of the contract that is performed by the Tulalip Tribal owned or Indian-owned enterprise or organization's own forces. Include the cost of supplies and materials obtained by the Tulalip Tribal Member NAOB or NAOB for the work of the contract, including supplies purchased or equipment leased by the Tulalip Tribal Member NAOB or NAOB (except supplies and equipment the lower-tiered Tulalip Tribal Member NAOB or NAOB purchases or leases from the Prime Contractor or its affiliates, unless the Prime Contractor is also a Tulalip Tribal Member NAOB or NAOB). Work performed by a Tulalip Tribal Member NAOB or NAOB, utilizing resources of the Prime Contractor or its affiliates will not be counted toward Tulalip Tribal-owned or Indian owned enterprise or organization goals. In very rare situations, a Tulalip Tribal Member NAOB or NAOB may utilize equipment and or personnel from a non-Tulalip Tribal Member NAOB or NAOB other than the Prime Contractor or its affiliates. Should this situation arise, the arrangement must be short-term and must have prior written approval from the Contracting Agency. The arrangement must not erode a Tulalip Tribal Member NAOB or NAOB's ability to perform a Commercially Useful Function (See discussion of CUF, below).
2. Count the entire amount of fees or commissions charged by a Tulalip Tribal Member NAOB or NAOB firm for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance.
3. When a Tulalip Tribal Member NAOB or NAOB subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted toward the Tulalip Tribal Member NAOB or NAOB requirement only if the Tulalip Tribal Member NAOB or NAOB's lower tier subcontractor is also a Tulalip Tribal Member NAOB or NAOB. Work that a Tulalip Tribal Member NAOB or NAOB subcontracts to a non-Tulalip Tribal Member NAOB or NAOB does not count toward the Tulalip Tribal Member NAOB or NAOB contracting requirement.
4. When a non-Tulalip Tribal Member NAOB or NAOB subcontractor further subcontracts to a lower-tier subcontractor or supplier who is a certified Tulalip Tribal owned or Indian-owned enterprise or organization, then that portion of the work further subcontracted may be counted toward the Tulalip Tribal Member NAOB or NAOB requirement, so long as it is a distinct clearly defined portion of the work of the subcontract that the Tulalip Tribal Member NAOB or NAOB is performing in a commercially useful function with its own forces.
5. Continue to count the work subcontracted to a decertified Tulalip Tribal-owned or Indian owned enterprise or organization after decertification, provided the prime contractor had a subcontract in force before the decertification and the prime

contractor's actions did not influence the Tulalip Tribal-owned or Indian-owned enterprise's or organization's decertification.

### ***Commercially Useful Function***

Payments to a Tulalip Tribal Member NAOB or NAOB will count toward Tulalip Tribal Member NAOB or NAOB requirements only if the Tulalip Tribal Member NAOB or NAOB is performing a commercially useful function on the contract.

1. A Tulalip Tribal Member NAOB or NAOB performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the Tulalip Tribal Member NAOB or NAOB must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, installing (if applicable) and paying for the material itself. Two party checks are not allowed.
2. A Tulalip Tribal Member NAOB or NAOB does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of Tulalip Tribal Member NAOB or NAOB participation.

### ***Trucking***

Use the following factors in determining whether a Tulalip Tribal Member NAOB or NAOB trucking company is performing a commercially useful function:

1. The Tulalip Tribal Member NAOB or NAOB must be responsible for the management and supervision of the entire trucking operation for which it is listed on a particular contract.
2. The Tulalip Tribal Member NAOB or NAOB must itself own and, with its own workforce, operate at least one fully licensed, insured, and operational truck used on the contract.
3. The Tulalip Tribal Member NAOB or NAOB receives credit only for the total value of the transportation services it provides on the contract using trucks it owns or leases, licenses, insures, and operates with drivers it employs.
4. For purposes of this paragraph a lease must indicate that the Tulalip Tribal-owned or Indian owned enterprise or organization has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the Tulalip Tribal Member NAOB or NAOB, so long as the lease gives the Tulalip Tribal Member NAOB or NAOB absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the Tulalip Tribal Member NAOB or NAOB.
5. The Tulalip Tribal Member NAOB or NAOB may lease trucks from another Tulalip Tribal Member NAOB or NAOB and may enter an agreement with an owner-operator who is certified as a Tulalip Tribal Member NAOB or NAOB. The Tulalip Tribal Member

NAOB or NAOB who leases trucks from another Tulalip Tribal Member NAOB or NAOB or employs a Tulalip Tribal Member NAOB or NAOB owner-operator receives credit for the total value of the transportation services the lessee Tulalip Tribal Member NAOB or NAOB provides on the contract.

6. The Tulalip Tribal Member NAOB or NAOB may also lease trucks from a non-Tulalip Tribal Member NAOB or NAOB and may enter an agreement with an owner-operator who is a non-Tulalip Tribal Member NAOB or NAOB. The Tulalip Tribal Member NAOB or NAOB who leases trucks from a non-Tulalip Tribal Member NAOB or NAOB or employs a non-Tulalip Tribal Member NAOB or NAOB owner-operator is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The Tulalip Tribal Member NAOB or NAOB does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a Tulalip Tribal Member NAOB or NAOB.
7. In any lease or owner-operator situation, as described in paragraphs 5 & 6 above, the following rules shall apply:
  - A written lease/rental agreement on all trucks leased or rented, showing the true ownership and the terms of the rental must be submitted and approved by the Contracting Agency prior to the beginning of the work. The agreement must show the lessor's name, trucks to be leased, and agreed upon amount or method of payment (hour, ton, or per load). All lease agreements shall be for a long-term relationship, rather than for the individual project. Does not apply to owner-operator arrangements.
  - Only the vehicle, (not the operator) is leased or rented. Does not apply to owner-operator arrangements.
8. In order for Tulalip Tribal Member NAOB or NAOB project requirements to be credited, Tulalip Tribal Member NAOB or NAOB trucking firms must be covered by a subcontract or a written agreement approved by the Contracting Agency prior to performing their portion of the work.

Expenditures Paid to Other Tulalip Tribal Member Native American Owned Business or Native American Owned Business

Expenditures paid to other Tulalip Tribal Member Native American Owned Business or Native American Owned Business for materials or supplies may be counted toward Tulalip Tribal Member NAOB or NAOB requirements as provided in the following:

### ***Manufacturer***

#### **1. Counting**

If the materials or supplies are obtained from a Tulalip Tribal Member NAOB or NAOB manufacturer, count 100 percent of the cost of the materials or supplies toward Tulalip Tribal Member NAOB or NAOB requirements.

## 2. Definition

To be a manufacturer, the firm operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.

3. In order to receive credit as a Tulalip Tribal Member NAOB or NAOB manufacturer, the firm must have received an “on-site” review and been approved by TERO to operate as a Tulalip Tribal Member NAOB or NAOB manufacturing firm prior to bid opening. Use of a Tulalip Tribal Member NAOB or NAOB manufacturer that has not received an on-site review and approval by TERO prior to bid opening will result in the bid being declared non-responsive, unless the contribution of the manufacturer was not necessary to meet the project requirement. To schedule a review, the manufacturing firm must submit a written request to TERO and may not receive credit towards Tulalip Tribal Member NAOB or NAOB participation until the completion of the review. Once a firm’s manufacturing process has been approved in writing, it is not necessary to resubmit the firm for approval unless the manufacturing process has substantially changed. Information on approved manufacturers (per contract) may be obtained from TERO.

### ***Regular Dealer***

## 1. Counting

If the materials or supplies are purchased from a Tulalip Tribal Member NAOB or NAOB regular dealer, 10 percent of the cost of the materials or supplies will count toward Tulalip Tribal Member NAOB or NAOB requirements.

## 2. Definition

- a) To be a regular dealer, the firm must own, operate or maintain a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. It must also be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.
- b) A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business, as provided elsewhere in this specification, if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers’ own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis.
- c) Packagers, brokers, manufacturers’ representatives, or other persons who arrange or expedite transactions are not regular dealers.



Regular dealer status is granted on a contract-by-contract basis. To obtain regular dealer status, a formal written request must be made by the interested supplier (potential regular dealer) to TERO. TERO must be in receipt of this request at least 7 calendar days prior to bid opening. Included in the request shall be a full description of the project, type of business operated by the Tulalip Tribal Member NAOB or NAOB, and the manner the Tulalip Tribal Member NAOB or NAOB will operate as a regular dealer on the specific contract. Once the request is reviewed by TERO, the Tulalip Tribal Member NAOB or NAOB supplier requesting it will be notified in writing whether regular dealer status was approved. Tulalip Tribal Member Native American Owned Business or Native American Owned Business that are approved as regular dealers for a contract (whenever possible) will be listed on the Tulalip Tribes TERO's Native American Owned Business (NAOB) registry Internet Homepage at: [www.tulaliptero.com/Home/Contractors/NAOBRegistryReport.aspx](http://www.tulaliptero.com/Home/Contractors/NAOBRegistryReport.aspx) prior to the time of bid opening. In addition, bidders may request confirmation of the Tulalip Tribal Member NAOB or NAOB supplier's approval to operate as a regular dealer on a specific contract by writing the TERO Department, 6406 Marine Drive, Tulalip, WA 98271 or by phone at (360) 716-4747. Use of a supplier that has not received approval as a regular dealer prior to bid opening will result in the bid being declared nonresponsive, unless the contribution of the regular dealer was not necessary to meet the project requirement.

Materials or Supplies Purchased from a Tulalip Tribal Member NAOB or NAOB  
With respect to materials or supplies purchased from a Tulalip Tribal Member NAOB or NAOB who is neither a manufacturer nor a regular dealer, the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site may be counted toward the goal. No part of the cost of the materials and supplies themselves may be applied toward Tulalip Tribal Member NAOB or NAOB requirements.

### ***Eligibility***

To be eligible for award of the contract, the bidder must properly complete and submit the List of Tulalip Tribal Member NAOB Subcontractor(s) and or Supplier(s) and the List of NAOB Subcontractor(s) and or Supplier(s) which have been made a part of the bidder's Bid Proposal Form. The above named lists contained in Section IV of the Bid Proposal Form will be used by the Contracting Agency in determining whether the bidder's bid proposal satisfies the Tulalip Tribal Member NAOB and NAOB requirements.

For each Tulalip Tribal Member NAOB and NAOB described in the Bid Proposal Form Section IV – List of Lower Tiered Subcontractor(s) and or Supplier(s), the bidder shall state the project role and work item in which that Tulalip Tribal Member NAOB or NAOB will participate. A general description of the work to be performed by the Tulalip Tribal Member NAOB or NAOB shall be included. If a Tulalip Tribal Member NAOB or NAOB will perform a partial item of work, the bidder shall also include a dollar amount for each partial item of work. The bidder shall also include a dollar amount for each Tulalip Tribal Member NAOB or NAOB listed in Section IV that will be applied towards meeting or exceeding the assigned Tulalip Tribal Member NAOB and NAOB contract requirements.

In the event of arithmetic errors in completing the Bid Proposal Form Section IV, the amount listed to be applied towards the requirement for each Tulalip Tribal Member NAOB and NAOB shall govern and the Tulalip Tribal Member NAOB and NAOB total shall be adjusted accordingly. The information and commitments demonstrated in the Bid Proposal Form Section IV shall become a condition of any subsequent award of a contract to that bidder and the Bid Proposal Form itself shall become a part of the subsequent contract.

The Contracting Agency shall consider as non-responsive and shall reject any bid proposal submitted that does not contain a Completed Section IV of the Bid Proposal Form or contains a List of Tulalip Tribal Member NAOB Subcontractor(s) and or Supplier(s) and or a List of NAOB Subcontractor(s) and or Supplier(s) that fails to demonstrate that the bidder will meet the Tulalip Tribal Member NAOB or NAOB contract requirements.

### ***Procedures Between Award and Execution***

After award of the contract, the successful bidder shall provide the additional information described below. A failure to comply shall result in the forfeiture of the bidder's proposal bond or deposit.

The Contracting Agency will notify the successful bidder of the award of the contract in writing and will include a request for a further breakdown of the Tulalip Tribal Member NAOB and NAOB information. After award and prior to execution of the contract, the bidder shall submit the following items:

- (1) Additional information for all successful Tulalip Tribal Member NAOB and NAOB as shown on the List of Tulalip Tribal Member NAOB Subcontractor(s) and or Supplier(s) and the List of NAOB Subcontractor(s) and or Supplier(s) included in Section IV of the Bid Proposal Form:
  - Correct business name, federal employee identification number (if available), and mailing address.
  - List of all bid items assigned to each successful Tulalip Tribal Member NAOB or NAOB, including unit prices and extensions.
  - Description of partial items (if any) to be sublet to each successful Tulalip Tribal Member NAOB or NAOB specifying the distinct elements of work under each item to be performed by the Tulalip Tribal Member NAOB or NAOB and including the dollar value of the Tulalip Tribal Member NAOB or NAOB.
  - Submit evidence of certification issued by the Tulalip TERO Offices for the Tulalip Tribal Member NAOB or NAOB.

Total amounts shown for each Tulalip Tribal Member NAOB and NAOB shall not be less than the amount shown on the Bid Proposal Form Section IV. This submittal, showing the Tulalip Tribal Member NAOB and NAOB work item breakdown, when accepted by the Contracting Agency and resulting in contract execution, shall become a part of the contract. A breakdown that does not conform to the List of Tulalip Tribal Member NAOB Subcontractor(s) and or Supplier(s) and the List of NAOB Subcontractor(s) and or Supplier(s) included in Section IV of the Bid Proposal Form or that demonstrates a lesser amount of Tulalip Tribal Member NAOB or NAOB participation than that included in the

Certification will be returned for correction. The contract will not be executed by the Contracting Agency until a satisfactory breakdown has been submitted.

## ***Procedures After Execution***

### **Reporting**

The Contractor shall submit a "Quarterly Report of Amounts Credited as Tulalip Tribal Member NAOB and NAOB Participation" (actual payments) on a quarterly basis for any calendar quarter in which Tulalip Tribal Member NAOB and NAOB work is accomplished or upon completion of the project, as appropriate. The quarterly reports are due on January 20th, April 20th, July 20th, and October 20th of each year. The dollars reported will be in accordance with the "Counting Tulalip Tribal Member Native American Owned Business or Native American Owned Business Participation" section of this specification.

In the event that the payments to a Tulalip Tribal Member NAOB or NAOB have been made by an entity other than the Prime Contractor (as in the case of a lower-tier subcontractor or supplier), then the Prime Contractor shall obtain the quarterly report, including the signed affidavit, from the paying entity and submit the report to the Contracting Agency.

### **Damages for Noncompliance**

When a Contractor violates the Tulalip Tribal Member NAOB and or NAOB provisions of the contract, the Contracting Agency may incur damages. These damages consist of additional administrative costs including, but not limited to, the inspection, supervision, engineering, compliance, and legal staff time and expenses necessary for investigating, reporting, and correcting violations. Damages attributable to a Contractor's violations of the Tulalip Tribal Member NAOB and or NAOB provisions may be deducted from progress payments due to the Contractor or from retainage withheld by the Contracting Agency as allowed by the Contract documents. Before any money is withheld, the Contractor will be provided with a notice of the basis of the violations and an opportunity to respond.

The Contracting Agency's decision to recover damages for a Tulalip Tribal Member NAOB and or NAOB provision violation does not limit its ability to suspend or revoke the Contractor's pre-qualification status or seek other remedies as allowed by tribal, federal or State law. In appropriate circumstances, the Contracting Agency may also refer the Contractor to Tribal, State, or Federal authorities for additional sanctions.

## **1-07.2 Sales Tax**

Section 1-07.2 including its sub-sections, in its entirety is revised to read:

The Tulalip Tribes of Washington is a federally recognized Indian Tribal government with a constitution and bylaws approved by the United States Secretary of the Interior. See: 65 Federal Register 13298, 13301 (March 13, 2000). As a recognized tribal government, The Tulalip Tribes of Washington and all of its governmental agencies, is a tax exempt entity. See: 26 USC §7871, and Washington Administrative Code Excise Tax Rule 192 (WAC 458-20-192). A majority of the project is Tax Exempt from all Sales and/or Use Taxes for all materials and supplies incorporated in construction of the work that become a permanent part of the Project and some B&O taxes.

Upon request a Tax Exemption form may be obtained from The Tulalip Tribes. For that portion of the project this is not within the exterior boundaries of The Tulalip Indian Reservation certain Washington State Taxes will apply.

The work on this contract is to be performed in Indian Country for an Indian Tribe and such work is exempt from State Sales and Use Tax and upon lands whose ownership may obligate the Contractor to pay State sales tax and other taxes on portions of the project work as follows:

1. The provisions of WAC 458-20-192(5)(a)(ii) apply to the following listed portions of the project:

The areas within the Tulalip Indian Reservation Boundary (all land west of Section line 8, 9.) are exempt from State Sales and Use Taxes. Certain B&O taxes are exempt also. Bidders shall consult with the State Department of Revenue regarding the potential tax liability.

2. The Contractor may be required to pay State Sales Tax and other taxes outside of the Tulalip Tribes Reservation portions of the project:

The areas outside of the Tulalip Indian Reservation Boundary (all land east of Section line 8, 9.) may be subject to State Sales and Use Taxes. Certain B&O taxes are exempt also. Bidders shall consult with the State Department of Revenue regarding the potential tax liability.

For bidding purposes the Contracting Agency has segregated the plan quantities which are within the Tulalip Tribes Reservation and outside of the Tulalip Tribes Reservation. These approximate quantities are shown on the Summary of Quantities sheets

The Washington State Department of Revenue has issued special rules on the State sales tax. The Contractor should contact the Washington State Department of Revenue for answers to questions in this area. The Contracting Agency will not adjust its payment if the Contractor bases a bid on a misunderstood tax liability.

The Contractor shall include all Contractor-paid taxes in the unit bid prices or other contract amounts.

The Contractor shall not collect from the Contracting Agency, retail sales tax on the full contract price. The Contracting Agency will not add this sales tax to each payment to the Contractor.

## **1-07.5 Environmental Regulations**

### **1-07.5(4) Air Quality**

The first paragraph of Section 1-07.5(4) is revised to read:

The Contractor shall comply with all rules of local air pollution authorities. If there are none, air-quality rules of the State Department of Ecology shall govern the Work located outside the boundaries of the Tulalip Tribes Reservation. The Contractor shall consult with the Tulalip

Tribes' Natural Resources Department to ascertain the applicable laws, ordinances, rules and regulations governing the Work on the Tulalip Indian Reservation.

**1-07.9 Wages**

**1-07.9(1) General**

Section 1-07.9(1) is supplemented with the following:

The Federal wage rates incorporated in this contract have been established by the Secretary of Labor under United States Department of Labor General Decision No. WA150001.

The State rates incorporated in this contract are applicable to all construction activities associated with this contract.

*(April 2, 2007 WSDOT GSP Option 4)*

**Application of Wage Rates for the Occupation of Landscape Construction**

State prevailing wage rates for public works contracts are included in this contract and show a separate listing for the occupation:

Landscape Construction, which includes several different occupation descriptions such as: Irrigation and Landscape Plumbers, Irrigation and Landscape Power Equipment Operators, and Landscaping or Planting Laborers.

In addition, federal wage rates that are included in this contract may also include occupation descriptions in Federal Occupational groups for work also specifically identified with landscaping such as:

Laborers with the occupation description, Landscaping or Planting, or

Power Equipment Operators with the occupation description, Mulch Seeding Operator.

If Federal wage rates include one or more rates specified as applicable to landscaping work, then Federal wage rates for all occupation descriptions, specific or general, must be considered and compared with corresponding State wage rates. The higher wage rate, either State or Federal, becomes the minimum wage rate for the work performed in that occupation.

Contractors are responsible for determining the appropriate crafts necessary to perform the contract work. If a classification considered necessary for performance of the work is missing from the Federal Wage Determination applicable to the contract, the Contractor shall initiate a request for approval of a proposed wage and benefit rate. The Contractor shall prepare and submit Standard Form 1444, Request for Authorization of Additional Classification and Wage Rate available at <http://www.wdol.gov/docs/sf1444.pdf>, and submit the completed form to the Project Engineer's office. The presence of a classification wage on the Washington State Prevailing Wage Rates For Public Works Contracts does not exempt the use of form 1444 for the purpose of determining a federal classification wage rate.

## 1-07.11 Requirements for Nondiscrimination

Section 1-07.11 is supplemented with the following:

*(August 5, 2013 WSDOT GSP Option 1)*

Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)

1. The Contractor's attention is called to the Equal Opportunity Clause and the Standard Federal Equal Employment Opportunity Construction Contract Specifications set forth herein.
2. The goals and timetables for minority and female participation set by the Office of Federal Contract Compliance Programs, expressed in percentage terms for the Contractor's aggregate work force in each construction craft and in each trade on all construction work in the covered area, are as follows:

### Women - Statewide

#### Timetable

#### Goal

Until further notice

6.9%

### Minorities - by Standard Metropolitan Statistical Area (SMSA)

Spokane, WA:

SMSA Counties:

Spokane, WA

2.8

WA Spokane.

Non-SMSA Counties

3.0

WA Adams; WA Asotin; WA Columbia; WA Ferry; WA Garfield; WA Lincoln,  
WA Pend Oreille; WA Stevens; WA Whitman.

Richland, WA

SMSA Counties:

Richland Kennewick, WA

5.4

WA Benton; WA Franklin.

Non-SMSA Counties

3.6

WA Walla Walla.

Yakima, WA:

SMSA Counties:

Yakima, WA

9.7

WA Yakima.

Non-SMSA Counties

7.2

WA Chelan; WA Douglas; WA Grant; WA Kittitas; WA Okanogan.

Seattle, WA:

SMSA Counties:

Seattle Everett, WA 7.2

WA King; WA Snohomish.

Tacoma, WA 6.2

WA Pierce.

Non-SMSA Counties 6.1

WA Clallam; WA Grays Harbor; WA Island; WA Jefferson; WA Kitsap; WA Lewis; WA Mason; WA Pacific; WA San Juan; WA Skagit; WA Thurston; WA Whatcom.

Portland, OR:

SMSA Counties:

Portland, OR-WA 4.5

WA Clark.

Non-SMSA Counties 3.8

WA Cowlitz; WA Klickitat; WA Skamania; WA Wahkiakum.

These goals are applicable to each nonexempt Contractor's total on-site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, or federally assisted project, contract, or subcontract until further notice. Compliance with these goals and time tables is enforced by the Office of Federal Contract compliance Programs.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, in each construction craft and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goal shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Office of Federal Contract Compliance Programs (OFCCP) within ten working days of award of any construction subcontract in excess of \$10,000 or more that are Federally funded, at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the Subcontractor; employer identification number of the Subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed. The notification shall be sent to:

U.S. Department of Labor  
Office of Federal Contract Compliance Programs Pacific Region  
Attn: Regional Director  
San Francisco Federal Building  
90 – 7th Street, Suite 18-300  
San Francisco, CA 94103(415) 625-7800 Phone  
(415) 625-7799 Fax

Additional information may be found at the U.S. Department of Labor website:  
<http://www.dol.gov/ofccp/TAguides/ctaguide.htm>

4. As used in this Notice, and in the contract resulting from this solicitation, the Covered Area is as designated herein.

Standard Federal Equal Employment Opportunity Construction Contract Specifications  
(Executive Order 11246)

1. As used in these specifications:
  - a. Covered Area means the geographical area described in the solicitation from which this contract resulted;
  - b. Director means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
  - c. Employer Identification Number means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U. S. Treasury Department Form 941;
  - d. Minority includes:
    - (1) Black, a person having origins in any of the Black Racial Groups of Africa.
    - (2) Hispanic, a fluent Spanish speaking, Spanish surnamed person of Mexican, Puerto Rican, Cuban, Central American, South American, or other Spanish origin.
    - (3) Asian or Pacific Islander, a person having origins in any of the original peoples of the Pacific rim or the Pacific Islands, the Hawaiian Islands and Samoa.
    - (4) American Indian or Alaskan Native, a person having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.
2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades



which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith effort to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of this Special Provision. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its action. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
  - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
  - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have

employment opportunities available, and maintain a record of the organizations' responses.

- c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
- d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunity and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the U.S. Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

- i. Direct its recruitment efforts, both oral and written to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
  - j. Encourage present minority and female employees to recruit other minority persons and women and where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.
  - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
  - l. Conduct, at least annually, an inventory and evaluation of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
  - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
  - n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
  - o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
  - p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of the obligations under 7a through 7p of this Special Provision provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensure that the concrete benefits of the program are reflected in the Contractor's minority and female work-force participation, makes a good faith effort to

meet its individual goals and timetables, and can provide access to documentation which demonstrate the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
11. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspensions, terminations and cancellations of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of this Special Provision, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the government and to keep records. Records shall at least include, for each employee, their name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, the Contractors will not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public

Works Employment Act of 1977 and the Community Development Block Grant Program).

16. Additional assistance for Federal Construction Contractors on contracts administered by Washington State Department of Transportation or by Local Agencies may be found at:

Washington State Dept. of Transportation  
Office of Equal Opportunity  
PO Box 47314  
310 Maple Park Ave. SE  
Olympia WA  
98504-7314  
Ph: 360-705-7090  
Fax: 360-705-6801  
<http://www.wsdot.wa.gov/equalopportunity/default.htm>

*(April 3, 2017 WSDOT GSP Option 4)*

### **Special Training Provisions**

#### **General Requirements**

The Contractor's equal employment opportunity, affirmative action program shall include the requirements set forth below. The Contractor shall provide on-the-job training aimed at developing trainees to journeyman status in the trades involved. The number of training hours shall be \*\*\* 800 \*\*\*. Trainees shall not be assigned less than 400 hours. The Contractor may elect to accomplish training as part of the work of a subcontractor, however, the Prime Contractor shall retain the responsibility for complying with these Special Provisions. The Contractor shall also ensure that this training provision is made applicable to any subcontract that includes training.

#### **Trainee Approval**

The Federal government requires Contracting Agencies to include these training provisions as a condition attached to the receipt of Federal highway funding. The Federal government has determined that the training and promotion of members of certain minority groups and women is a primary objective of this training provision. The Contractor shall make every effort to enroll minority groups and women trainees to the extent such persons are available within a reasonable recruitment area. This training provision is not intended and shall not be used to discriminate against any applicant for training, whether that person is a minority, woman or otherwise. A non-minority male trainee or apprentice may be approved provided the following requirements are met:

1. The Contractor is otherwise in compliance with the contract's Equal Employment Opportunity and On-the-Job Training requirements and provides documentation of the efforts taken to fill the specific training position with either minorities or females
2. or, if not otherwise in compliance, furnishes evidence of his/her systematic and direct recruitment efforts in regard to the position in question and in promoting the enrollment and/or employment of minorities and females in the craft which the proposed trainee is to be trained

3. and the Contractor has made a good faith effort towards recruiting of minorities and women. As a minimum this good faith effort shall consist of the following:
  - Distribution of written notices of available employment opportunities with the Contractor and enrollment opportunities with its unions. Distribution should include but not be limited to; minority and female recruitment sources and minority and female community organizations;
  - Records documenting the Contractor's efforts and the outcome of those efforts, to employ minority and female applicants and/or refer them to unions;
  - Records reflecting the Contractor's efforts in participating in developing minority and female on-the-job training opportunities, including upgrading programs and apprenticeship opportunities;
  - Distribution of written notices to unions and training programs disseminating the Contractor's EEO policy and requesting cooperation in achieving EEO and OJT obligations.

No employee shall be employed as a trainee in any classification in which the employee has successfully completed a training course leading to journeyman status or in which the employee has been employed as a journeyman. The Contractor's records shall document the methods for determining the trainee's status and findings in each case. When feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

For the purpose of this specification, acceptable training programs are those employing trainees/apprentices registered with the following:

1. Washington State Department of Labor & Industries — State Apprenticeship Training Council (SATC) approved apprenticeship agreement:
  - a. Pursuant to RCW 49.04.060, an apprenticeship agreement shall be;
    - i. an individual written agreement between an employer and apprentice
    - ii. a written agreement between (an employer or an association of employers) and an organization of employees describing conditions of employment for apprentices
    - iii. a written statement describing conditions of employment for apprentices in a plant where there is no bona fide employee organization.

All such agreements shall conform to the basic standards and other provisions of RCW Chapter 49.

2. Apprentices must be registered with U.S. Department of Labor — Apprenticeship Training, Employer, and Labor Services (ATELS) approved program.

Or

3. Trainees participating in a non-ATELS/SATC program, which has been approved by the contracting agency for the specific project.
4. For assistance in locating trainee candidates, the Contractor may call WSDOT's OJT Support Services Technical Advisor at (360) 704-6314.

### **Obligation to Provide Information**

Upon starting a new trainee, the Contractor shall furnish the trainee a copy of the approved program the Contractor will follow in providing the training. Upon completion of the training, the Contractor shall provide the Contracting Agency with a certification showing the type and length of training satisfactorily completed by each trainee.

### **Training Program Approval**

The Training Program shall meet the following requirements:

1. The Training Program (DOT Form 272-049) must be submitted to the Engineer for approval prior to commencing contract work and shall be resubmitted when modifications to the program occur.
2. The minimum length and type of training for each classification will be as established in the training program as approved by the Contracting Agency.
3. The Training Program shall contain the trades proposed for training, the number of trainees, the hours assigned to the trade and the estimated beginning work date for each trainee.
4. Unless otherwise specified, Training Programs will be approved if the proposed number of training hours equals the training hours required by contract and the trainees are not assigned less than 400 hours each.
5. After approval of the training program, information concerning each individual trainee and good faith effort documentation shall be submitted on (DOT Form 272-050.)
6. In King County, laborer trainees or apprentices will not be approved on contracts containing less than 2000 training hours as specified in this Section. In King County, no more than twenty percent (20%) of hours proposed for trainees or apprentices shall be in the laborer classification when the contract contains 2000 or more hours of training as specified in this Section. Trainees shall not be assigned less than 400 hours.
7. Flagging programs will not be approved. Other programs that include flagging training will only be approved if the flagging portion is limited to an orientation of not more than 20 hours.

8. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Some off-site training is permissible as long as the training is an integral part of an approved training program.
9. It is normally expected that a trainee will begin training on the project as soon as feasible after start of work, utilizing the skill involved and remain on the project as long as training opportunities exist in the work classification or upon completion of the training program. It is not required that all trainees be on board for the entire length of the contract. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.
10. Wage Progressions: Trainees will be paid at least the applicable ratios or wage progressions shown in the apprenticeship standards published by the Washington State Department of Labor and Industries. In the event that no training program has been established by the Department of Labor and Industries, the trainee shall be paid in accordance with the provisions of RCW 39.12.021 which reads as follows:

Apprentice workmen employed upon public works projects for whom an apprenticeship agreement has been registered and approved with the State Apprenticeship Council pursuant to RCW 49.04, must be paid at least the prevailing hourly rate for an apprentice of that trade. Any workman for whom an apprenticeship agreement has not been registered and approved by the State Apprenticeship Council shall be considered to be a fully qualified journeyman, and, therefore, shall be paid at the prevailing hourly rate for journeymen.

### **Compliance**

In the event that the Contractor is unable to accomplish the required training hours but can demonstrate a good faith effort to meet the requirements as specified, then the Contracting Agency will adjust the training goals accordingly.

### **Requirements for Non ATELS/SATC Approved Training Programs**

Contractors who are not affiliated with a program approved by ATELS or SATC may have their training program approved provided that the program is submitted for approval on DOT Form 272-049, and the following standards are addressed and incorporated in the Contractor's program:

- The program establishes minimum qualifications for persons entering the training program.
- The program shall outline the work processes in which the trainee will receive supervised work experience and training on-the-job and the allocation of the



approximate time to be spent in each major process. The program shall include the method for recording and reporting the training completed shall be stated.

- The program shall include a numeric ratio of trainees to journeymen consistent with proper supervision, training, safety, and continuity of employment. The ratio language shall be specific and clear as to application in terms of job site and workforce during normal operations (normally considered to fall between 1:10 and 1:4).
- The terms of training shall be stated in hours. The number of hours required for completion to journeyman status shall be comparable to the apprenticeship hours established for that craft by the SATC. The following are examples of programs that are currently approved:

| CRAFT                    | HOURS       |
|--------------------------|-------------|
| Laborer                  | 4,000       |
| Ironworker               | 6,000       |
| Carpenter                | 5,200-8,000 |
| Construction Electrician | 8,000       |
| Operating Engineer       | 6,000-8,000 |
| Cement Mason             | 5,400       |
| Teamster                 | 2,100       |

- The method to be used for recording and reporting the training completed shall be stated.

### **Measurement**

The Contractor may request that the total number of “training” hours for the contract be increased subject to approval by the Contracting Agency. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other sources do not prohibit other reimbursement. Reimbursement to the Contractor for off-site training as indicated previously may only be made when the Contractor does one or more of the following and the trainees are concurrently employed on a Federal-aid project:

- contributes to the cost of the training,
- provides the instruction to the trainee,
- pays the trainee’s wages during the off-site training period.

Reimbursement will be made upon receipt of a certified invoice that shows the related payroll number, the name of trainee, total hours trained under the program, previously paid hours under the contract, hours due this estimate, and dollar amount due this estimate. The certified invoice shall show a statement indicating the Contractor’s effort to enroll minorities and women when a new enrollment occurs. If a trainee is participating in a SATC/ATELS approved apprenticeship program, a copy of the certificate showing apprenticeship registration must accompany the first invoice on which the individual appears. Reimbursement for training occurring prior to approval of the training program will be allowed if the Contractor verbally notifies the Engineer of this occurrence at the

time the apprentice/trainee commences work. A trainee/apprentice, regardless of craft, must have worked on the contract for at least 20 hours to be eligible for reimbursement.

### **Payment**

The Contractor will be reimbursed under the item "Training" per hour for each hour of training for each employee.

## **1-07.11(2) Contractual Requirements**

### **1-07.11(2)A Equal Employment Opportunity (EEO) Responsibilities**

Under the heading "Title VI Responsibilities" of Section 1-07.11(2)A, items 4, 5 and 6 in the first paragraph are revised to read:

4. **Information and Reports** – The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by The Tulalip Tribes, the Washington State Department of Transportation or the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to The Tulalip Tribes, the Washington State Department of Transportation, or the Federal Highway Administration as appropriate, and shall set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance** – In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, The Tulalip Tribes shall impose such Contract sanctions as it or the Washington State Department of Transportation or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
  - a. Withholding of payments to the Contractor under the Contract until the Contractor complies, and/or;
  - b. Cancellation, termination, or suspension of the Contract, in whole or in part.
6. **Incorporation of Provisions** – The Contractor shall include the provisions of paragraphs (1) through (5) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The Contractor shall take such action with respect to any Subcontractor or procurement as The Tulalip Tribes, the Washington State Department of Transportation or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance.

Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or supplier as a result of such direction, the Contractor may request The Tulalip Tribes to enter into such litigation to protect the interest of The Tulalip Tribes and, in addition, the Contractor may request the Washington State Department of Transportation enter into such litigation to protect the interests of the State and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

## **1-07.11(10) Records and Reports**

### **1-07.11(10)B Required Records and Retention**

The first paragraph of Section 1-07.11(10)B is revised to read:

All records must be retained by the Contractor for a period of 3 years following acceptance of the Contract Work. All records shall be available at reasonable times and places for inspection by authorized representatives of either The Tulalip Tribes, the Washington State Department of Transportation or the Federal Highway Administration.

## **1-07.13 Contractor's Responsibility for Work**

### **1-07.13(1) General**

Replace the first paragraph of Section 1-07.13(1) with the following:

All Work and material for the Contract, including any change order or Engineer's Order Work, shall be at the sole risk of the Contractor until the entire improvement has been completed as determined by the Engineer, except as provided in this section.

### **1-07.13(4) Repair of Damage**

Section 1-07.13(4) is revised to read:

*(August 6, 2001 WSDOT GSP Option 1)*

The Contractor shall promptly repair all damage to either temporary or permanent work as directed by the Engineer. For damage qualifying for relief under Sections 1-07.13(1), 1-07.13(2) or 1-07.13(3), payment will be made in accordance with Section 1-04.4. Payment will be limited to repair of damaged work only. No payment will be made for delay or disruption of work.

## **1-07.17 Utilities and Similar Facilities**

Section 1-07.17 is supplemented with the following:

*(April 2, 2007 WSDOT GSP Option 1)*

Locations and dimensions shown in the Plans for existing facilities are in accordance with available information obtained without uncovering, measuring, or other verification.

The following addresses and telephone numbers of utility companies known or suspected of having facilities within or adjacent to the project limits are supplied for the Contractor's convenience:

\*\*\* Verizon  
OSP Engineering  
PO Box 1003  
Everett, WA 98200  
Attn: Tim Rennick  
(425) 263-4034

Tulalip Technology Data Services  
8825 Quil Ceda Boulevard, Suite O  
Tulalip, WA 98271  
Attn: Stephen Doherty  
(360) 654-2233

Tulalip Broadband  
8825 Quil Ceda Boulevard, Suite O  
Tulalip, WA 98271  
Attn: Richard Brown  
(360) 654-3270

Puget Sound Energy  
19900 No. Creek Parkway  
Bothell, WA 98011  
Attn: David Matulich  
(425) 214-3020\*\*\*

During the construction of the project, utility companies will be providing services, may be relocating their facilities, and may be impacted as a result of construction. It shall be the Contractor's responsibility to coordinate with these utility companies and schedule his construction activities accordingly.

#### **1-07.18 Public Liability and Property Damage Insurance**

Section 1-07.18, including its sub-sections, in its entirety is revised to read:

The Contractor shall obtain and keep in force the following policies of insurance. The policies shall be with companies or through sources approved by the State Insurance Commissioner pursuant to RCW 48.05. Unless otherwise indicated below, the policies shall be kept in force from the execution date of the Contract until the date of acceptance by The Tulalip Tribes and the Secretary (Section 1-05.12).

1. Owners and Contractors Protective (OCP) Insurance providing bodily injury and property damage liability coverage with limits of \$5,000,000 per occurrence and, per project, in the aggregate for each policy period, written on Insurance Services Office (ISO) form CG0009 1204, together with Washington State Department of Transportation amendatory endorsement CG 2908 1195 specifying the Contracting Agency, the State, the Governor, the Commission, the Secretary, the Department and all officers and employees of the State as named insured.
2. Commercial General Liability (CGL) Insurance written under ISO Form CG0001 or its equivalent, with minimum limits of \$1,000,000 per occurrence and \$2,000,000 annual aggregate per project. CGL shall include coverage for Employers Liability or Washington Stop Gap at \$1,000,000 per accident. Excess liability shall be provided in the amount of \$9,000,000 per occurrence and annual aggregate over the CGL, Stop Gap and auto liability coverage.

This coverage may be any combination of primary, umbrella, or excess liability coverage affording total liability limits of not less than \$10,000,000 per occurrence and

in the aggregate. Products and completed operations coverage shall be provided for a period of 3 years following Substantial Completion of the Work

3. Commercial Automobile Liability Insurance providing bodily injury and property damage liability coverage for all owned and nonowned vehicles assigned to or used in the performance of the Work, with a combined single limit of not less than \$1,000,000 per occurrence. This coverage may be any combination of primary, umbrella, or excess liability coverage affording total liability limits of not less than \$1,000,000 per occurrence, with The Tulalip Tribes and the State named as an additional insured or designated insured in connection with the Contractor's Performance of the Contract. If pollutants are to be transported, MCS 90 and CA 99 48 endorsements are required on the Commercial Automobile Liability insurance policy unless in-transit pollution risk is covered under a Pollution Liability insurance policy.
4. The Contractor shall be Named Insured and the Contracting Agency, The Tulalip Tribes, the State, all their respective officers and employees, and their respective members, directors, officers, employees, agents, and consultants (collectively the "Additional Insureds") shall be included as Additional Insureds for all policies and coverages specified in this Section, with the exception of the OCP policy. Said insurance coverage shall be primary and noncontributory insurance with respect to the insureds and the Additional Insureds. Any insurance or self-insurance beyond that specified in this Contract that is maintained by any Additional Insured shall be in excess of such insurance and shall not contribute with it. All insurance coverage required by this Section shall be written and provided by "occurrence-based" policy forms rather than by "claims made" forms.

All endorsements adding Additional Insureds to required policies shall be issued on (i) form CG 20 10 11 85 or a form deemed equivalent by the Contracting Agency, providing the Additional Insureds with all policies and coverages set forth in this Section, with the exception of the OCP and Commercial Auto policies or (ii) form CA 20 48 or forms deemed equivalent by Contracting Agency, providing the Additional Insureds with all coverages required under the Commercial Automobile Liability.

5. The coverage limits to be provided by the Contractor for itself and to the Contracting Agency and Additional Insureds pursuant to this Section or any Special Provision, shall be on a "per project" aggregate basis with the minimum limits of liability as set forth herein for both general liability and products/completed operations claims. The additional insured coverage required under this Section for products/completed operations claims shall remain in full force and effect for not less than 3 years following Substantial Completion of the project. If the Contractor maintains, at any time, coverage limits for itself in excess of limits set forth in this Section 1-07.18 or any Special Provision, then those additional coverage limits shall also apply to the Contracting Agency and the Additional Insured. This includes, but is not limited to, any coverage limits provided under any risk financing program of any description, whether such limits are primary, excess, contingent, or otherwise.
6. All insurance policies and coverages required under Sections 1-07.18 and 1-07.10 shall contain a waiver of subrogation against the Contracting Agency, the State, and any Additional Insureds, and their respective departments, agencies, boards, and

commissions, and their respective officers, officials, agents, and employees for losses arising from Work performed by or on behalf of the Contractor. This waiver has been mutually negotiated by the parties.

7. Where applicable, the Contractor shall cause each Subcontractor to provide insurance that complies with all applicable requirements of the Contractor-provided insurance as set forth herein, in circumstances where the Subcontractor is not covered by the Contractor-provided insurance. The Contractor shall have sole responsibility for determining the limits of coverage required, if any, to be obtained by Subcontractors, which determination shall be made in accordance with reasonable and prudent business practices. In the event that a Subcontractor is required to add the Contractor as an Additional Insured pursuant to its contract for Work at the Project, then the Contractor shall also cause each Subcontractor to include the Contracting Agency and the Additional Insureds, as Additional Insureds as well, for primary and noncontributory limits of liability under each Subcontractor's Commercial General Liability, Commercial Automobile Liability, and any other coverages that may be required pursuant to a "Special Provision".
8. Unless specifically noted otherwise in the Contract Documents, the parties to this Contract do not intend by any of the provisions of this Contract to cause the public or any member thereof or any other Person to be a third-party beneficiary of the Contract Documents. Nothing in this Contract authorizes anyone not a party to this Contract or a designated third-party beneficiary to this Contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of this Contract. It is the further intent of the Contracting Agency and the Contractor in executing the Form of Contract that no individual, firm, corporation, or any combination thereof that supplies materials, labor, services, or equipment to the Contractor for the performance of the Work shall become thereby a third-party beneficiary of this Contract.

The Contract Documents shall not be construed to create a contractual relationship of any kind between the Contracting Agency and a Subcontractor or any other Person except the Contractor.

9. The Owners and Contractors Protective Insurance policy shall not be subject to a deductible or contain provisions for a deductible. The Commercial General Liability policy and the Commercial Automobile Liability Insurance policy may, at the discretion of the Contractor, contain such provisions. If a deductible applies to any claim under these policies, then payment of that deductible will be the responsibility of the Contractor, notwithstanding any claim of liability against the Contracting Agency. However, in no event shall any provision for a deductible provide for a deductible in excess of \$50,000.00.
10. With the exception of the Commercial Automobile liability coverage, no policies of insurance required under this Section shall contain an arbitration or alternative dispute resolution clause applicable to disputes between the insurer and its insureds. Any and all disputes concerning (i) terms and scope of insurance coverage afforded by the policies required hereunder and/or (ii) extra contractual remedies and relief, which may be afforded policy holders in connection with coverage disputes, shall be resolved in Washington Superior Court, applying Washington law.

11. Prior to Contract execution, the Contractor shall file with the Department of Transportation, Contract Payment Section, PO Box 47420, Olympia, WA 98504-7420, ACORD Form Certificates of Insurance evidencing the minimum insurance coverages required under these Specifications. Within 30 days of being awarded a Contract, the Contractor shall provide the Department with complete copies, which may be electronic copies, of all insurance policies required under this Section and any Special Provisions.
12. Prior to Contract execution, the Contractor shall file with The Tulalip Tribes, ACORD Form Certificates of Insurance evidencing the minimum insurance coverages required under these Specifications. Within 30 days of being awarded a Contract, the Contractor shall provide The Tulalip Tribes with complete copies, which may be electronic copies, of all insurance policies required under this Section and any Special Provisions.
13. The Contractor shall provide a 30 day in advance written notice to The Tulalip Tribes of any policy cancellations and provide the Department of Transportation, Contract Payment Section, PO Box 47420, Olympia, WA 98504-7420, by U.S. Mail, notice of any policy cancellation within 2 business days of receipt of cancellation.
14. Failure on the part of the Contractor to maintain the insurance as required, or not to provide certification and copies of the insurance prior to the time specified in Subsection 11 and 12 above, shall constitute a material breach of Contract upon which the Contracting Agency may, after giving 5-business days' notice to the Contractor to correct the breach, immediately terminate the Contract or, at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the Contracting Agency on demand, or at the sole discretion of the Contracting Agency, offset against funds due the Contractor from the Contracting Agency. All costs for insurance, including any payments of deductible amounts, shall be considered incidental to and included in the unit Contract prices and no additional payment will be made.

## **1-08 PROSECUTION AND PROGRESS**

### **1-08.4 Prosecution of Work**

Section 1-08.4 is supplemented with the following:

#### ***Construction Coordination Meetings***

The Contracting Agency or its authorized representative will schedule and administer construction coordination meetings on a weekly basis with the Engineer, Contractor, subcontractors and other interested parties. The Contractor shall actively and regularly prepare for, attend and participate in these meetings throughout the duration of the project until Contract Completion. The purpose of these meetings is to coordinate and facilitate communication between the parties to facilitate the performance of their respective responsibilities and the successful completion of the project.

The Contracting Agency will establish the weekly meeting times, dates and location with agreement from the Engineer and Contractor.

Project meetings shall be held at a location designated by the Contracting Agency.

The Contracting Agency will make physical arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes and distribute copies within 5 working days to participants and those affected by decisions made at meetings.

Attendance: Contracting Agency, Engineer, Contractor's Project Manager and Project Superintendent all as appropriate to address agenda topics for each meeting. Major subcontractors and suppliers shall attend when requested by the Contracting Agency, Engineer or Contractor.

The specific administrative and procedural requirements for project meetings including but not limited to Safety, RFI Status, Contract Submittals, Materials Submittals, RFPs, Field Directives, Change Orders, project schedule and 2 week look ahead, Working Days, Critical path items, Contract compliance, Pay applications, and open discussion.

### **Safety**

All parties agree that they are responsible for compliance with all tribal, local, and federal laws, regulations, and standards that pertain to safety, as those laws, regulations, and standards apply to their employees. All parties recognize that the responsibility for employee safety rests with each employer respectively. Each contractor (prime or sub) shall be responsible for the safety of its own employees. The Contracting Agency accepts no responsibility for, nor will it provide any safety consultation, monitoring, or enforcement to any contractor on the site concerning the safety of contractor's employees. Any safety equipment needed on the job, including but not limited to PPE, shall be furnished by each contractor for its employees.

The Contracting Agency will regard safety on this project to be of the utmost importance. Under no conditions shall safety requirements be waived for the sake of cost, schedule, or convenience. SAFETY MAY BE USED AS CRITERIA FOR APPROVAL OF PAY APPLICATIONS. Unsafe conditions, lack of proper and or untimely documentation and submittals, and lack of adherence to safety rules and requirements will not be tolerated.

Each contractor, AS A MINIMUM, shall follow all tribal, local, and federal laws regarding worker safety. This shall include all requirements of OSHA and referenced standards therein included.

The Contracting Agency may, at various times, request voluntary OSHA inspections. Each contractor shall immediately correct and respond to any violations in writing to the Contracting Agency, and to the appropriate agency.

Indiscriminate accumulations of debris, waste, or scrap in work areas will not be permitted. (Areas must be designated for storage or disposal.) All materials, tools, and equipment must be stored in an orderly manner in designated areas.

### **Safety Program**

- A. Contractor shall submit, within ten days of Notice to Proceed, a copy of its company safety program including jobsite specific safety plans. This program shall incorporate all lower-tier subcontractor safety information or separate policies shall



be submitted for all lower-tier subcontractors used on the project. This safety policy shall conform to all OSHA requirements and shall include as follows:

- B. A Hazard Communications Program, including site specific Materials Safety Data Sheets (MSDS) for all chemicals used by Contractor and its subcontractors.
  - 1. Provisions for continual training of all on-site employees. This shall be done by holding weekly safety toolbox talks, documented by signed attendance sheets with safety topic submitted to the Contracting Agency at each weekly project meeting.
  - 2. Weekly jobsite safety inspections shall be completed by each Contractor.
  - 3. Designation and continual training of competent persons for the project.
  - 4. Contractor shall provide services of a competent safety person (as defined by OSHA) for the project to inspect the project for safety hazards related to their Work. The safety person should not be one of the superintendents dedicated to this Project; however, the safety person shall be on-site whenever Work is being performed by Contractor. The safety person shall attend the Project coordination meetings.
  - 5. Contractor, with assistance from all contractors' safety persons, shall perform a monthly total Project safety audit conducted by a company safety officer or independent consultant of the Contractor. Results of the safety audit shall be submitted to the Contracting Agency and distributed to all contractors the same day the audit is conducted by Contractor. If a contractor does not immediately address any observed or noted safety concern, Contractor's company safety officer or independent consultant shall contact the Owner, through the Contracting Agency. Contractor's company safety officer or independent consultant, with assistance from Contractor's competent safety person, shall record all accidents for the Project and report their findings to the Owner, through the Contracting Agency.
  - 6. Provisions for enforcement of the safety policies by Site Foreman, Superintendent and or Project Manager.
  - 7. Documentation that each on-site employee has been trained in general safety and has been informed of the location of the Safety Program, Haz-Com Program and Emergency procedures on this project.

#### **Submittals**

- A. Company safety programs, as described above, shall be submitted to the Contracting Agency within ten days of Notice to Proceed or Letter of Intent to Award. Additions to the program, such as documentation of training as new employees arrive at the site, shall be forwarded to the Contracting Agency. All contractor Safety Programs, and Haz-Com Programs, with MSDS Sheets, will be kept in one central location within the Contractor's office throughout the duration of the project.
- B. Contractor is required to conduct and all employees are required to attend a "Tool Box" type safety meeting once a week. These meetings may either be presided over by Contractor's foreman or another competent representative designated by Contractor. The Contracting Agency's personnel are available to participate in these safety meetings.  
Contractor will be responsible to submit WEEKLY tool box safety meeting minutes to the Contracting Agency while Contractor has employees on-site.

- C. All weekly inspections will be documented by Contractor and submitted to the Owner, through the Contracting Agency. Contractor shall immediately correct all deficiencies and submit a list of corrective actions within one working day, or sooner if required, of safety inspection.
- D. Subject specific daily and or weekly inspections by Contractor, including temporary electric, crane, or other work activities as required, shall be timely submitted to the Owner, through the Contracting Agency.
- E. Refer to CSI specifications for submittal requirements.

#### **Training**

- A. Contractor shall ensure that employee designated as Project Competent Person has been fully trained for this task and has the full authority to take corrective action when required.
- B. Contractor shall provide continual training to Project Competent Person, Superintendent, and Foreman as required by tribal or OSHA standards.
- C. The Contracting Agency may recommend General Safety Topics to enable Contractor's supervising personnel to train employees if a Contractor requests such assistance.

### **1-08.5 Time For Completion**

Section 1-08.5 is supplemented with the following:

Refer to Section 4 of the Tulalip Tribes of Washington Contract Agreement for contract completion dates.

### **1-08.6 Suspension of Work**

Section 1-08.6 is supplemented with the following:

The equitable adjustment for work suspended for any reason except weather-related events shall be paid at a per day rate under the bid item "Suspension of Work," per day, if called for by the Contracting Agency.

Contractor's unit price for the bid item, "Suspension of Work", per day, shall include all costs incurred by the Contractor associated with work stoppage including all requirements for Maintenance During Suspension of Work described in Section 1-08.7. Engineer will provide a minimum of five (5) working day notice prior to such suspension of work.

## **1-09 MEASUREMENT AND PAYMENT**

### **1-09.8 Payment for Material on Hand**

Section 1-09.8 is supplemented with the following:

The Contracting Agency shall reimburse the Contractor for manufacturing and purchase of equipment, pipe and materials meeting requirements for the plans and specifications before it is used in the Work as follows:

1. Ninety percent payment of the actual material invoice amount when the materials are delivered to the project site or other agreed upon storage site.

Revise the last paragraph of WSDOT spec to read:

*(August 3, 2009 WSDOT GSP Option 1)*

The Contracting Agency will not pay for material on hand when the invoice cost is less than \$2,000. As materials are used in the work, credits equaling the partial payments for them will be taken on future estimates. Each month, no later than the estimate due date, the Contractor shall submit a letter to the Project Engineer that clearly states: 1) 90% of the amount originally paid on the invoice (or other record of production cost) for the items on hand, 2) the dollar amount of the material incorporated into each of the various work items for the month, and 3) the amount that should be retained in material on hand items. If work is performed on the items and the Contractor does not submit a letter, all of the previous material on hand payment will be deducted on the estimate. Partial payment for materials on hand shall not constitute acceptance. Any material will be rejected if found to be faulty even if partial payment for it has been made.

#### **1-09.9 Payments**

Revise the first paragraph to read:

The basis of payment will be the actual quantities of Work performed according to the Contract and as specified for payment in accordance with this section and with. For items Bid as lump sum, with a bid price of more than or equal to \$20,000, the Contractor shall submit a breakdown of their lump sum price in sufficient detail for the Project Engineer to determine the value of the Work performed on a monthly basis. Lump sum breakdowns shall be provided to the Project Engineer no later than the date of the preconstruction conference.

Delete the third paragraph and replace it with the following:

Progress payments for completed work and material on hand will be based upon progress estimates prepared by the Engineer. A progress estimate cutoff date will be established at the preconstruction conference.

The initial progress estimate will be made not later than 30 days after the Contractor commences the work, and successive progress estimates will be made every month thereafter until the Completion Date. Progress estimates made during progress of the work are tentative, and made only for the purpose of determining progress payment. The progress estimates are subject to change at any time prior to the calculation of the Final Payment.

The value of the progress estimate will be the sum of the following:

1. Unit Price Items in the Bid Form — the approximate quantity of acceptable units of work completed multiplied by the unit price.
2. Lump Sum Items in the Bid Form — partial payment for lump sum Bid items will be a percentage of the price in the Proposal based on the Engineer's determination of the amount of Work performed, with consideration given to, but not exclusively based on, the Contractor's lump sum breakdown for that item.

3. Change Orders — entitlement for approved extra cost or completed extra work as determined and authorized by the Engineer.

Progress payments will be made in accordance with the progress estimate less:

1. Retainage per Section 1-09.9(1);
2. The amount of Progress Payments previously made; and
3. Funds withheld by the Contracting Agency for disbursement in accordance with the Contract Documents.

Progress payments for work performed shall not be evidence of acceptable performance or an admission by the Contracting Agency that any work has been satisfactorily completed. The determination of payments under the contract will be final in accordance with Section 1-05.1.

**1-09.9(1) Retainage**

Delete 1-09.9(1) and replace with the following:

**1-09.9(1) Retainage**

The Contracting Agency shall retain from each progress estimate a sum of 5 percent of the monies earned by the Contractor. Monies retained shall be held in a fund by the Contracting Agency.

Release of the retainage will be made 60 days following the Completion Date, provided the following conditions are met:

1. On Contracts totaling more than \$35,000, a release has been obtained from the Washington State Department of Revenue.
2. Affidavits of Wages Paid for the Contractor and all Subcontractors are on file with the Contracting Agency (RCW 39.12.040).
3. A certificate of Payment of Contributions Penalties and Interest on Public Works Contract is received from the Washington State Employment Security Department.
4. Washington State Department of Labor and Industries (per Section 1-07.10) shows the Contractor is current with payments of industrial insurance and medical aid premiums.
5. All claims, as provided by law, filed against the retainage have been resolved. In the event claims are filed and provided the conditions of 1, 2, 3, and 4 are met, the Contractor will be paid such retained percentage less an amount sufficient to pay any such claims together with a sum determined by the Contracting Agency sufficient to pay the cost of foreclosing on claims and to cover attorney's fees.

## **1-09.11            Disputes and Claims**

Section 1-09.11 is revised to read:

### ***Forum For Equitable Relief***

The Tribal Court of the Tulalip Tribes of Washington shall have exclusive jurisdiction over any action or proceeding for any injunction or declaratory judgment concerning any agreement or performance under the Contract Documents or in connection with the Project. Any such action or proceeding arising out of or related in any way to the Contract or performance thereunder shall be brought only in the Tribal Court of the Tulalip Tribes of Washington and the Contractor irrevocably consents to such jurisdiction and venue. The Contract shall be governed by the law of the State of Washington.

### ***Forum For Money Damages***

The Tribal Court of the Tulalip Tribes of Washington shall be the exclusive jurisdiction for any action or proceeding for any injunction or declaratory judgment concerning any agreement or performance under the Contract Documents or in connection with the Project. The Tribal Court of the Tulalip Tribes of Washington shall be the exclusive jurisdiction for any action or proceeding by the Contractor or the Contractor's Surety, if applicable, for any money damages concerning any agreement or performance under the Contract Documents or in connection with the Project.

## **1-09.13            Claims Resolution**

Section 1-09.13 is deleted in its entirety.

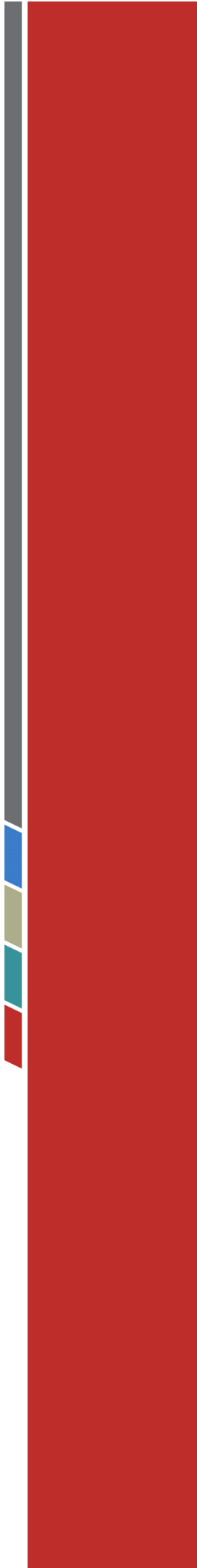
## **WSDOT Divisions 2 through 9**

See Technical Specifications.

## **END OF SPECIAL PROVISIONS**

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# Technical Specifications



# Division 01

## General Requirements





**SECTION 01 01 00**  
**SCHEDULE OF MAJOR EQUIPMENT ITEMS BASIS OF BID**

This form is to be completed and included with bid.

Refer to Section 01 01 01, "Substitution of Major Equipment Items" for details on what major equipment prices are to be included with bid document:

| Spec<br>Section | Basis of Bid<br>Description and<br>Equipment Nos. | Column 1                       |                                         | Column 2                                |                                  |
|-----------------|---------------------------------------------------|--------------------------------|-----------------------------------------|-----------------------------------------|----------------------------------|
|                 |                                                   | 'Basis of Bid'<br>Manufacturer | 'Basis of Bid'<br>Price for<br>Contract | 'Proposed<br>Alternate'<br>Manufacturer | 'Proposed<br>Alternate'<br>Price |
| 46 50 50        | MBR Aeration<br>Blower                            | Universal Blower<br>PAC        | \$                                      | Excelsior                               | \$                               |
| 46 20 70        | Drum Screen                                       | Huber                          | \$                                      |                                         | \$                               |
| 22 13 49        | Permeate Pumps                                    | Gorman Rupp                    | \$                                      |                                         | \$                               |
| 22 13 39        | MLR Pumps                                         | Fairbanks Nijhuis              | \$                                      |                                         | \$                               |
| 26 29 23        | VFMCs                                             | Yaskawa                        | \$                                      |                                         | \$                               |
| 40 70 00        | Dissolved<br>Oxygen Probe                         | ECD                            | \$                                      |                                         | \$                               |

**END OF SECTION**

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**SECTION 01 01 01**  
**SUBSTITUTION OF MAJOR EQUIPMENT ITEMS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. This section defines the total bid price format for major equipment items. The “Basis of Bid” for major equipment items for preparation of the Total Bid Price listed on the Bid Item Schedule consists of the items identified in Column 1 of Table 1 in Section 01 01 00, “Schedule of Major Equipment Items Basis of Bid.”
- B. The use of this bidding format specified herein and included in the Legal Documents is intended to:
  - 1. Provide a basis for all bidding contractors (Bidders) on which to base their TOTAL BID PRICE.
  - 2. Protect the Owner and Bidders so that no one Bidder gains an unfair bid price advantage by quoting a lower price for a major equipment item which is not “or equal” in the opinion of the Owner and Engineer.
  - 3. Assure that the Owner receives full benefit of the savings in cost involved in any substitution of a major equipment item.
- C. The project has been designed to specifically include Basis of Bid Equipment furnished by Basis of Bid Equipment Manufacturers. Alternate Equipment from Bidder Proposed Alternate Equipment manufacturers may be considered if the Equipment is determined by the Owner and Engineer, in their opinion, to meet or exceed the quality, performance, function, reliability, and ease of operation and maintenance of the Basis of Bid Equipment and also is determined to conform to the requirements and constraints for installation within the work specified in the Contract Documents. If Proposed Alternate Equipment is selected by the Owner after shop drawings submittals are reviewed and accepted as described in Paragraph 1.03, the Owner may accept the “Proposed Alternate” cost for one or both of the Bidder Proposed Alternate Equipment and incorporate the lower cost in the Total Base Bid Amount.
  - 1. Bidders shall only fill in Column 2 of the Schedule of Major Equipment Items – Basis of Bid form if the Proposed Alternate Equipment cost is lower than the Basis of Bid Equipment listed in Column 1.
- D. Bidders shall only select and list one Bidder Proposed Alternate Equipment and associated Approved Equal Cost for each specification section listed in the Schedule of Major Equipment that meets the requirements listed in Paragraph 1.01.C and offers the largest cost savings to the Owner.
- E. If the Owner and Engineer determine the Bidder Proposed Alternate Equipment is not equal or well suited for use at this project location, the bidding Contractor’s Proposed

Alternate shall not be accepted, and the Basis of Bid Equipment shall be provided at no increase in the Total Base Bid Amount.

## **1.02 BID ITEM SCHEDULE**

- A. The Bid Item list included in Section 01 01 00, "Schedule of Major Equipment Items Basis of Bid," lists the Specification Sections for Basis of Bid Equipment and Basis of Bid Equipment Manufacturers for this project.
- B. If the Bidder proposes to offer a price for a Proposed Alternate Equipment Manufacturer, the Bidder shall enter the Price for each Proposed Alternate Equipment Manufacturer, and legibly write-in the name of the Proposed Alternate Equipment Manufacturer. The Price shall include the labor and material cost, profit and overhead, and necessary appurtenances to provide a complete system to furnish and install the Bidder Proposed Alternate Equipment in accordance with the Contract Documents. If the Owner does not accept the Bidder's Proposed Alternate Equipment Manufacturer, either individually or wholly, the Bidder shall provide the Basis of Bid Equipment furnished by the Basis of Bid Equipment Manufacturer for the amounts included in the Total Base Bid Amount.
- C. Where more than one manufacturer is listed as approved for inclusion as the Basis of Bid, the Bidder shall indicate which of the listed items that the Bid is based on by circling the chosen manufacturer, or crossing out all except for the chosen manufacturer.
- D. It is not the intent of the Contract Documents to contain proprietary, exclusionary, or discriminatory requirements other than those based on performance. Manufacturers who believe that their equipment can meet the performance requirements and, with the exception of minor details, the technical requirements of the Contract Documents, are encouraged to submit "Qualification Packages" for a Proposed Alternate major equipment item after the bidding period ends.

## **1.03 SHOP DRAWING SUBMITTALS**

- A. The supply of Basis of Bid or Bidder Proposed Alternate Equipment listed in the Schedule of Major Equipment Basis of Bid in the Legal Documents section does not eliminate the need for shop drawing submittals and reviews during construction, nor does it eliminate the requirement that the equipment manufacturer satisfy the requirements of the Contract Documents.
- B. The Bidder, when requested by the Owner at some period after the bids are opened, shall submit the following information to the Owner in a timely manner for all Bidder Proposed Alternate Equipment Manufacturers written into the Schedule of Major Equipment Items – Basis of Bid table included in the Legal Documents.
  - 1. Complete catalog information, brochures, and cut sheets of proposed equipment, size, number, or quantity supplied.
  - 2. Shop drawings from a similar installation to show equipment configuration.
  - 3. Manufacturer's certification letter stating the proposed equipment meets or exceeds all specified performance, functional, operational, and materials requirements.

4. Name, address, and phone number of the Washington service representative for the proposed equipment, and number of years the representative has serviced the proposed equipment.
  5. Installation list including contact names and telephone numbers for similar equipment in operation.
  6. Any other requested information deemed necessary to determine the Proposed Alternate equipment is equal to or exceeds the quality, performance, function, reliability, and ease of operation of the basis of bid equipment.
- C. Shop drawings shall be furnished in accordance with Section 01 33 00, "Contractor Submittals."
- D. Should the Contractor furnish a major equipment item requiring changes to the Contract Documents, he shall notify the Engineer in writing of all dimensional, mechanical, electrical, and structural changes and/or requirements for the major equipment item's use in the Work and shall reimburse the Owner for any associated redesign and/or construction drawings.
- E. Bidders shall consider all costs associated in furnishing and installing the basis of bid equipment item in their installed price proposals. Redesign and contract drawing revisions to accommodate Bidder Proposed Alternate Equipment will be prepared by the Engineer during the shop drawing review process. Reimbursement by the Contractor to the Owner for this engineering and design effort shall be based on 3.25 times the Engineer's salary cost plus reimbursable expenses at cost.

## **END OF SECTION**

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**SECTION 01 04 10**  
**PROJECT COORDINATION**

**PART 1 – GENERAL**

**1.01 REQUIREMENTS INCLUDED**

- A. This section specifies minimum administrative and supervisory requirements necessary for coordination on the project to be collectively fulfilled by Contractor.
- B. Where applicable, each Contractor performing work on the project shall participate in these coordination requirements, even though certain areas of responsibility are assigned to a specific Contractor.
- C. Progress Meetings, Coordination Meetings and Pre-Installation Conferences are included in Section 01 20 00, "Project Meetings."

**1.02 COORDINATION**

- A. Contractor shall coordinate its construction activities with the Contracting Agency to assure efficient and orderly installation of each part of the Work. Contractor shall coordinate its operations with operations included under different sections of the specifications that are dependent upon each other for proper installation, connection and operation.
  - 1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
  - 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
  - 4. Where necessary, prepare a memoranda for distribution to each entity involved outlining special procedures required for coordination. Include such items as required notices, reports and attendance at meetings.
  - 5. Prepare similar memoranda for the Contracting Agency and separate Contractors where coordination of their Work is required.
  - 6. Coordination requirements also apply to changes in the work resulting from field directives, change orders, etc.
- B. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials.
- C. Each Contractor performing work on the project shall refer to the project construction schedule for information regarding the overall sequence of Work.

### **1.03 SUBMITTALS**

- A. Staff Names: Within ten (10) days after receipt of Notice of Intent to Proceed, submit a list of Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities, list their addresses and telephone numbers to the Contracting Agency. Contractor's Superintendent shall be responsible for supervision of Work only and shall not participate in the performance of the Work.
- B. Post copies of the list in the Project meeting room, Contractor's temporary field office, and at each temporary telephone.
- C. It shall be the requirement of Contractor to identify any changes in such staff submissions, assignments, addresses and telephone numbers within ten (10) days of said change by providing a copy of same to the Contracting Agency and to post such changes in the specified locations.

### **PART 2 – PRODUCTS**

#### **2.01 COORDINATION OF WORK**

- A. Location of equipment and structure is approximate. Final locations of new equipment shall be field verified and coordinated in the field at the time of installation.
- B. If any Contractor performing work on the project fails to properly complete their responsibilities concerning coordination drawings it may result in reinstallation of previously installed work at no additional cost to the Owner.

### **PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**



**SECTION 01 10 00  
SUMMARY OF WORK**

**PART 1 – GENERAL**

**1.01 THE REQUIREMENT**

- A. The Work to be performed under this Contract shall consist of furnishing tools, equipment, materials, supplies, and manufactured articles, and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all Work or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and all Work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete and proper construction of the Work in good faith shall be provided by the Contractor as though originally so indicated, at no increase in cost to the Owner.
- B. The work in this Contract has been divided into two schedules. See Bid Proposal form regarding breakdown of Schedule A and Schedule B phases of construction.

**1.02 WORK COVERED BY CONTRACT DOCUMENTS**

- A. MBR Treatment Facility Upgrade Work Includes:
  - 1. Supply and installation of a headworks drum screen.
  - 2. Supply and installation of blowers, pumps, sanitary sewer piping, and supports.
  - 3. Supply and installation of Kubota submerged membrane units (SMUs) in MBR tanks. Installation includes all piping up, equipment and instruments provided by Kubota.
  - 4. Stainless steel, ductile iron and other pipe supply and installation.
  - 5. Supply and installation of electrical MCCs, VFDs, instruments, duct banks, conduit, and PLC replacement.
  - 6. Demolition and replacement of existing pipe, conduits, metal supports, and rollup door at the facility.
  - 7. Other facility improvements and additions as shown on the Contract Drawings and described herein.

**1.03 CONTRACT METHOD**

- A. The Work hereunder shall be constructed under one unit-price contracts.

**1.04 SCHEDULE AND WORK SEQUENCE**

- A. Contractor shall adhere to the following schedule for construction of this project.
- B. Substantial Completion: Project must be substantially completed per days provided in the project Contract. Successful completion of commissioning, as specified in

Section 01 45 24, "Installation, Testing, Commissioning, and Training" for the entire facility must occur as a condition of substantial completion.

- C. Final Project Completion: Project must reach Final completion per days provided in the project Contract.
- D. Work Sequence: The Contractor shall be solely responsible for the means, manpower, methods, techniques, schedule, sequences, and procedures of construction, and all safety programs required to perform the Work specified in the Contract Documents. There are construction limitations and phasing requirements for the Work that the Contractor must adhere to. Contractor shall be responsible for determining the exact sequence of Work required to meet the schedule dates specified in this section.
- E. Interference with Work on Utilities: The Contractor shall cooperate fully with all utility forces of the Owner or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the Work, and shall schedule the Work so as to minimize interference with said relocation, altering, or other rearranging of facilities.

#### **1.05 CONTRACTOR USE OF SITE**

- A. The Contractor's use of the Site shall be limited to its construction operations, including on-Site storage of materials and equipment.
- B. Do not use areas outside of the construction limits shown on the drawings for construction operations.

#### **1.06 OWNER USE OF THE SITE**

- A. Cooperate and coordinate with the Owner to facilitate the Owner's operations and to minimize interference with the Contractor's operations. The Owner shall be allowed access to the Site during the period of construction for operation of the wastewater facility. Representatives of the Owner and regulatory agencies shall be allowed access at all times.

#### **1.07 PROJECT MEETINGS**

- A. Progress Meetings: See Section 01 20 00.
- B. Work Sequence: See Section 01 12 16.
- C. Construction Schedule: See Section 01 32 20.

### **PART 2 – PRODUCTS (NOT USED)**

### **PART 3 – EXECUTION (NOT USED)**

## **END OF SECTION**

## **SECTION 01 12 00**

### **INSTALLATION, TESTING, AND COMMISSIONING FOR MBR EQUIPMENT**

#### **PART 1 – GENERAL**

##### **1.01 GENERAL**

- A. The MBR equipment to be installed at the Tulalip WWTP was pre-selected by the Owner during the design of the Tulalip WWTP. The MBR Equipment Supplier is Kubota Membrane USA Co., 11807 North Creek Parkway South, Bothell, WA 98011. Kubota's project manager is Abdul Alsoliman, (425) 898-2858.
- B. See 46 11 30 for Kubota MBR specifications. The preliminary Kubota MBR Drawings and Equipment information is also provided in the appendices of the Contract Documents.
- C. The MBR equipment is to be provided by the Contractor as part of the Work. There is no contractual relationship between the MBR Equipment Supplier and the Owner. It is the Contractor's responsibility to ensure that a complete and fully functional installation, in accordance with the Contract Documents, is provided. By submitting a bid, the Contractor has represented that he has reviewed the MBR preliminary shop drawings for the equipment.
- D. By submitting a bid, the Contractor agrees to accept the Kubota MBR Supply, and purchase the MBR equipment for the price shown on the Bid Form. Costs for all work necessary to install, test, and commission the MBR shall be included in the bid item for the upgrade construction at the WWTP.
- E. It is the Contractor's responsibility to coordinate his scope of supply with that of the MBR Equipment Supplier. Where the Contract Documents identify or differentiate between the scope of supply for the MBR Equipment Supplier and the Contractor, such identification is made for the convenience of the Contractor, and is not necessarily complete or accurate. It is the Contractor's responsibility to provide all materials for a fully functional WWTP that conforms to the Contract Documents, whether or not those materials are supplied by the MBR Equipment Supplier, other Suppliers, or directly by the Contractor. The Engineer will not be responsible for clarifying the MBR Equipment Supplier's scope of supply or resolving disputes between the Contractor and the MBR Equipment Supplier.
- F. Contractor shall be responsible for taking delivery (offloading) the MBR Equipment when it is delivered to the site. Contractor is responsible for storage of MBR Equipment after delivery to the site. Per Kubota requirements, all electrical, mechanical, and miscellaneous equipment and parts shall be stored in a dry enclosed heated (minimum 40 degrees Fahrenheit) space.

##### **1.02 SHOP DRAWINGS**

- A. Preliminary shop drawings for the MBR equipment have been submitted by the manufacturer and reviewed by the Engineer and Owner. Portions of the preliminary shop drawings pertaining to the MBR installation are provided in the appendices of the Contract Specifications.
- B. The shop drawing information provided in the MBR Supply Contract Documents includes the MBR Equipment Supplier's scope of supply, equipment list, warranty information, and

Kubota's scope exclusions. Shop drawing information is provided for the membrane modules, equipment and instruments. Information on valves and instruments to be provided by the MBR Equipment Supplier. If not included in the Appendices it may be available in electronic format from Kubota. Available drawings from Kubota, showing their process and instrumentation diagrams are included. Another Kubota MBR submittal will be submitted during construction.

- C. Where the drawings from the MBR Equipment Supplier and the Project Drawings conflict, the Project Drawings shall have precedence.
- D. Kubota MBR "Submittal During Construction": Submit this MBR submittal for review and approval, as specified in Section 01 33 00, "Contractor Submittals," and Section 46 11 30.

## **PART 2 – PRODUCTS**

### **2.01 EQUIPMENT SUPPLIED BY MBR EQUIPMENT SUPPLIER**

- A. The Technical Specifications for the MBR Equipment and Instruments 46 11 30 and the preliminary Shop Drawings describe the scope of supply of the MBR equipment supplier.
- B. Supply all labor, tools, and materials required to complete the MBR equipment installation.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. Ship, store, and install the MBR equipment in accordance with the manufacturer's recommendations and as shown on the Drawings.
- B. Shipping, storage, and installation instructions for the MBR equipment provided by the MBR Equipment Supplier are included with the shop drawings. These instructions do not necessarily represent complete instructions for this equipment. It is the Contractor's responsibility to determine what additional procedures, if any, are required to provide a fully functional and operational installation.
- C. MBR tank cleaning, see Section 01 74 23.

### **3.02 PAINTING**

- A. Paint equipment as specified in Section 09 91 25, "Equipment and Piping Painting"

### **3.03 MANUFACTURER'S SERVICES**

- A. Services to be provided by the MBR Equipment Supplier during installation, testing, and start-up of the equipment and for the training of the Owner's staff in the operation and maintenance of the equipment, shall be as specified in the MBR Equipment Supply Contract Documents.
- B. A minimum of 10-days' notice shall be provided to the Owner prior to on-site training or facility start-up.

C. Testing and Commissioning:

1. Testing and commissioning for the MBR equipment shall conform to the procedures described in the MBR shop drawings and the procedures specified in Section 01 45 24, "Installation, Testing, Commissioning, and Training." The price quoted by the MBR Equipment Supplier for the supply of the MBR equipment includes the Supplier's costs for testing, including labor and travel. Contractor's costs for testing and commissioning shall be included in the WWTP construction bid item.
2. The manufacturer and the Contractor shall field test and calibrate the installed equipment to demonstrate that all equipment will satisfactorily perform the functions and criteria specified.
3. Manufacturer's Installation Certification Forms (included in specification Section 01 99 90, "Reference Forms") shall be completed for each piece of equipment provided by the MBR Equipment Supplier and for the MBR installation as a whole.

**END OF SECTION**

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## **SECTION 01 12 16**

### **WORK SEQUENCE**

#### **PART 1 – GENERAL**

##### **1.01 SUMMARY**

- A. This section specifies completion time, milestones, work sequence, constraints, hours of work, incentives, and liquidated damages.
- B. Schedule and conduct all work in a manner consistent with the Contract, comply with the construction schedule and milestone requirements and constraints of the work as specified.
- C. Plan the sequence of construction to accommodate all Contract requirements.
- D. The wastewater treatment plant is continuously receiving and pumping sewage, and those functions shall not be interrupted except as specified herein. Coordinate the work to avoid any interference with normal operation of the existing treatment facility. Any repairs, cleanup, or associated work related to sewage spills or backups, including but not limited to nearby residences, are the Contractor's responsibility.

##### **1.02 DEFINITIONS**

- A. Substantial Completion: When used in this specification section for determining completion of a milestone, "substantial completion" shall be as defined in the General Requirements, and shall also mean that the following work elements are complete:
  - 1. Component and Operational Testing on the system, or systems, are complete as defined in Section 01 45 24, "Installation, Testing, Commissioning, and Training," with satisfactory results meeting the Contract performance criteria and are accepted by the Project Representative.
  - 2. Training is complete.
  - 3. Draft O&M Manuals have been submitted.
  - 4. Record Drawing monthly required markups for the systems are up to date as required in Section 01 78 39, "Record Drawings and Information."
  - 5. The systems have completed 7 consecutive days of problem-free automated operation with associated monitoring telemetry to the Tribes' SCADA system.

##### **1.03 SUBMITTALS**

- A. Provide the following submittals in accordance with Section 01 33 00, "Contractor Submittals:"
  - 1. Maintenance of Plant Operation (MOPO) forms for equipment or facility shutdown (included in Section 01 99 90). MOPO submittals shall include advanced notices of equipment shutdowns or restricted use.
  - 2. For each milestone, submit a written statement to notify the Project Representative when Contractor believes the milestone is complete.

3. To make use of Exceptions to Operational Constraints shown in this specification, submit weather forecast to document anticipation of dry weather conditions, prior to use of the listed exception.
4. The Contractor shall notify the Project Representative when it believes it has completed a milestone. The Project Representative will then inspect and provide a punch list, if necessary.

#### **1.04 COMPLETION TIMES**

- A. Complete the work within the specified Contract Time in accordance with the Legal Documents. Achieve Substantial Completion and Physically Completed within the work days shown in the Legal Documents: The Tulalip Tribes of Washington Contract Agreement.

#### **1.05 WORK SEQUENCE**

- A. General: The Contractor is responsible for determining the sequence of work within the constraints of this Contract.
- B. Prior to beginning of work that changes the existing site conditions, the following shall be completed:
  1. Submit and obtain a “No Exceptions” response on the submittal of a project-specific Health and Safety Plan prior to start of fieldwork.
  2. Complete all required and specified erosion and sedimentation control measures.
  3. Meet with the Tribes’ Operations and Maintenance staff to understand facility operations to maintain flow, safety requirements, and communication issues.

#### **1.06 CONSTRAINTS**

- A. Notification: For all equipment and facility shutdowns and use restrictions, provide the Project Contracting Agency with advanced notice, and Contractor shall receive approval from the Project Contracting Agency, prior to the shutdown or restricted use. An Owner-approved MOPO application is required prior to Notice of Shutdown. Provide the Tribes a minimum preliminary advanced notification of 7 days and 48 hours confirmed notice prior to shutdowns and use restrictions.
- B. Refer to Section 01 45 24, “Installation, Testing, Commissioning, and Training”, for requirements of start-up and commissioning that applies to each new facility listed in this specification section. MBR MLSS concentration shall be 5,000 mg/l, or greater before permeating can occur. Coordinate with Owner. Clean water testing of these systems will be required before start-up and wastewater is allowed through each system. Contractor is responsible for temporary piping and pumping needed for all testing. REC pumps and permeate pumps may not require clean water testing prior to Operational testing. Coordinate with Owner.



C. Operational Constraints: The following operational constraints apply unless otherwise specified:

1. The Contractor shall not harm or interfere with operation of the treatment facility. Short-term (less than 6 hours) shutdowns of facility may be possible Monday to Thursday between 12:00 a.m. and 6:00 a.m., but must be coordinated with WWTP Operations staff. Longer shutdowns for individual tanks, pipes or pumps may be possible, but shall be coordinated with Owner. No shutdowns or tank emptying shall be allowed on these weekends: Memorial, 4th of July, Labor Day, New Year's Day, or other weekends stated by the Owner.
2. Controls and telemetry for the WWTP, with connection to the Tribes' SCADA system, shall be maintained at all times to allow monitoring of equipment alarms and process. A temporary monitoring system may be used during temporary shutdowns.
3. The Contractor may need to provide power for construction at the plant site. Coordinate with Owner. Contractor shall make arrangements with the electrical utility if necessary. The Contractor shall provide the special connections required for his work.
4. Should it become desirable or necessary for a new process system or item of equipment be operated before permanent power is available, the Contractor shall provide temporary power for such:
  - a. Headworks:
    - 1) The Contractor shall maintain the existing headworks screening facility while installing the new drum screen. Contractor will need to coordinate with the Owner on any impacts to screening operation.
    - 2) The new headworks drum screen shall be placed into operation as part of Schedule A upgrades. Before Schedule B upgrades are made, the Owner will use the new screen to screen and clean existing mixed liquor (MLSS) from the MBR tanks by pumping via the Schedule A drain pump station, for a minimum of 4 weekdays. Contractor and Owner shall coordinate this operation. All equipment alarm functions, phone call-out system, and the reuse water system must be functional and tested before the drum Screen Operational test can be started (see Section 01 45 24).
  - b. Tank and MLSS Cleaning:
    - 1) A critical Contractor task is to clean all four MBR tanks, and Anoxic Tank 2 before the new MBR membranes are placed into operation. Refer to tank cleaning requirements of Section 01 74 23. See item a.2. above regarding MLSS screening. While the Owner is using the Drain Pump Station to recycle and screen MLSS, the pipe gallery in the MBR Building may have 1 or 2 feet of wastewater in it and be inaccessible to the Contractor.

c. Post MBR and Anoxic Tank Pipe connections:

- 1) Note that Anoxic Tank 2 is occasionally filled with wastewater during overflow at high flow conditions. Contractor shall coordinate with Owner on schedule for connection of new pipes to Anoxic Tank 2. All tank pipe connections shall be done before this tank is brought on-line.
- 2) Contractor shall review Drawings and site piping to determine how to connect new SI pipe (between Screens 1 and 2 discharge pipe and Anoxic Tank 2) without requiring shutdown of Post MBR tank.
- 3) The Pre-aeration tank will need to be emptied to connect east side MBRI pipes. The Contractor shall make the 16-inch MBRI to Anoxic Tank 2 valve and pipe connections before Anoxic Tank 2 is placed in operation. Contractor shall provide a temporary pump and pipe to empty Pre-aeration tank prior to MBRI pipe connections. All Pre-aeration tank MLSS shall be passed through new drum screen during emptying operation.
- 4) For connection of 16-inch SREC and REC pipes at Post MBR tank, Contractor shall provide a pump to empty Post MBR tank prior to pipe cap removal and new pipe connection. All influent flow and tank MLSS shall be passed through Screen 2 during this tank's emptying operation. The Owner will clean the Post MBR tank after it is emptied. Contractor to coordinate with Owner.
- 5) Contractor shall coordinate with Owner for removal of 12-inch MBRI and connection of replacement of 20-inch MBRI pipe to Pre-aeration tank (west side of pipe gallery, Schedule B work). Contractor shall schedule the Headworks and items above so that Pre-aeration and Anoxic Tank 1 are off line, if necessary, during connection of this MBRI piping. Contractor to provide pumps for emptying these tanks.

d. MBR Tank Construction:

- 1) The Contractor shall coordinate with the Owner to ensure that two MBR tanks are in operation except for the acceptable shutdown period detailed in paragraph 1.06.C.1. Early morning weekday shutdowns may be possible at low-flow periods, but only if coordinated with the Owner.
- 2) Equipment and most piping for MBRs 1 and 4 can be installed while existing MBRs 2 and 3 remain on-line. Note that solution in CLS pipe is hazardous. Coordinate with Owner to flush these pipes before any worker contact. Coordinate with Owner on new MLR pump seal water installation. W3 water must be provided continuously to existing MLR pumps while installing new.
- 3) During the installation of MBR equipment and pipe modifications in the MBR Building (Schedule B construction) only two MBR tanks will be kept in operation (on-line). Until construction is complete on all 4 MBR tanks the Contractor shall be responsible for transferring (these 2) existing or new Kubota membranes between MBR tanks. When construction is being done on MBRs 1 and 3, the membrane cassettes shall be in MBRs 2 and 4. When

construction is being done on MBRs 2 and 4, the cassettes shall be in MBRs 1 and 3. Once wet, membranes must be kept wet at all times. Contractor shall be responsible for keeping membranes immersed or sprayed with water all the times. Refer to Section 01 74 23 regarding cleaning of MBR tanks.

- 4) Contractor is responsible for providing pump and piping to pump clean water and MLSS into, out of, and between MBR tanks. During the sequence of installation, the Contractor shall provide a temporary, portable 250- to 300-gpm pump and pipe to transfer MLSS from one MBR tank to another. Based on the sequence outlined in this specification, this pumping will be required at least four times for MBR installation (not including Headworks). During each of these MLSS transfer operations, the Contractor will coordinate with the Owner regarding transferring membrane cassettes from one MBR tank to an empty MBR prior to MLSS transfer. If the Contractor cannot complete the transfer to the new tank and fill the tank with MLSS before he stops work, it will be Contractor's responsibility to continuously water spray the non-immersed membranes until the transfer operation is complete.
- 5) Once new electrical, controls, Kubota equipment, and other equipment is installed for MBR 4, the Contractor can make temporary REC and PERM header connections for MBR 4 and perform clean water testing (per step 6 below) before membranes are installed. Once clean water testing is complete and clean water removed, NEW Kubota membranes can be installed in MBR 4. After checks are complete MBRs 2 and 4 will operate in gravity mode while the MBRs 1 and 3 can be taken off-line for cleaning and installation of permeate pumps, piping, valves, Kubota equipment, electrical, controls and installation/modification can be completed in the east half of the MBR Building. Contractor shall provide a pump and pipe per step 4 above to transfer MLSS from MBR 3 to MBR 4. Existing MBRI pipes may also be used to help transfer MLSS from the MBR 3 to MBR 4 tank.
- 6) Clean water testing: Pipe pressure tests to be done with clean or reuse water. All permeate pipe and pumps for all MBRs shall be tested with clean or reuse water before the membrane cassettes are placed into the tank. Filling the tank to elevation 17.0 with water will be the easiest way to do this testing. All aeration (PA) pipe and diffusers shall also be tested with 24 inches clean water in the tank before membrane installation. The MLR pumps shall be given a 10-minute clean water pump test (after permeate and air systems are tested) before membranes are installed. Only 10 minutes of clean water pumping to the headworks building will be allowed. After clean water testing, Contractor is required to pump clean water from tanks (to other tanks or drain) prior to installation and connection of membrane cassettes. Contractor shall also provide pumps to transfer/dispose of all liquids if start-up fails and new equipment/pipes have to be taken off line.
- 7) Once all MBR 1 and MBR 3 pump, pipe, electrical, controls, Kubota equipment, MLR pumps, permeate pumps, and other installation is complete and Section 01 45 24 steps are completed, these 2 MBRs could be placed into operation so that MBR 2, MBR 4 and west half of MBR Building can be taken off-line. After clean water testing, the first steps to bring MBRs 1 and 3 into operation (one MBR at a time) are to transfer MLSS and membranes from

MBR 2 to 1 and from MBR 4 to 3 (per step 4 above). Contractor shall provide pump and pipe per step 4 above to transfer MLSS. Once MBRs 2 and 4 are off-line, permeate pump, blowers, valves, electrical, controls, Kubota equipment, and all pipe installation/modification could be completed on MBRs 2 and 4. Note that permeate pipe arrangement in MBR 2 is mirror image to other MBRs. Two-inch cassette permeate side headers are on mirror sides. Install blind flanges on unused permeate headers prior to installation of cassettes. See Section 22 13 17, 2.08, regarding flex hose required for transferring existing MBR cassettes.

- 8) Once permanent pipe changes and equipment, pipe, electrical, and controls installation is completed on MBRs 2 and 4 and west half of MBR Building, clean water testing of permeate, PA, and REC pipe and pumps shall be done per steps included in step 6 above. Once completed, NEW Kubota membranes can be installed in MBR 2. MBR 2 startup checks shall then be performed before MLSS transfer from MBR 1 (per step 4 above) is performed and MBR 2 is placed on-line.
- 9) Once MBR 2 is tested and on-line, MBR 4 can be clean water tested per step 6. After testing, tank emptying, MBR membrane transfer, and pipe connections made, MLSS can be transferred from MBR 3 (per step 3 above) and MBR 4 can be checked by Owner before placing on-line.
- 10) Contractor shall provide MOPO forms to schedule shutdowns and schedule MBR tank and process change over 20 calendar days in advance for approval by Owner so process programming can be coordinated.

- D. Access to all facility equipment, valves, and controls shall be maintained for the Tribes' operation and maintenance activities.

## **1.07 HOURS OF WORK**

- A. Unless otherwise specified, conform to applicable jurisdictions and other pertinent ordinances regarding limitations on work hours or specific parts of the work. Request work hour variations in writing, and obtain written approval from Snohomish County and the Project Representative prior to initiating work hours outside of the hours allowed by this Contract.
- B. Submit a schedule of working hours in accordance with the General Requirements Section:
  1. Working hours, see General Requirements section.
  2. Requests for work outside of the scheduled work hours, see General Requirements section:
    - a. If the Contractor works unscheduled hours, and/or if the Contractor has not obtained Project Representative's approval at least 72 hours prior to the start of unscheduled work, the Contractor shall be liable for the costs of Tribes' overtime inspection and for each person performing such inspection on behalf of the Tribes.

## **1.08 INCENTIVES AND LIQUIDATED DAMAGES**

- A. Incentives: Not used in this Contract.
- B. Liquidated Damages: See Legal Documents section.

## **PART 2 – PRODUCTS (NOT USED)**

## **PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 15 20**  
**APPLICATIONS FOR PAYMENT**

**PART 1 – GENERAL**

**1.01 RELATED REQUIREMENTS**

- A. Drawings and general provisions of Contract, including General and Special Conditions.

**1.02 SUMMARY**

- A. This section specifies administrative and procedural requirements governing Contractor's Applications for Payment.

**1.03 PROCEDURES**

- A. Payments will be processed in accordance with Standard Specifications for Road, Bridge, and Municipal Construction Section 1-09, "Measurement and Payment," and as follows:
  - 1. Each Application for Payment shall be consistent with previous applications and payments as certified by the Contracting Agency and paid for by the Owner.
    - a. The initial Application for Payment, the Application for Payment at time of Contract Completion, and the final Application for Payment involve additional requirements.
  - 2. Payment Application Deadlines: Final copies of Pay Applications are due on the last business day of each month. Draft copies are to be reviewed by the Contracting Agency at least five days prior to the submission of the final pay application. This schedule may be revised for the purpose of expediting this process.
  - 3. Application Preparation:
    - a. Contractor shall prepare and submit pencil copy concurrently to the Contracting Agency and Project Engineer for review and comment.
  - 4. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
    - a. Executed Contract.
    - b. List of Contractor's staff assignments.
    - c. Copies of permits required to be obtained by Contractor.
    - d. Certificates of insurance and insurance policies.
    - e. Bonds.

- f. Safety Data Sheets (SDS).
  - g. Project specific Corporate Safety Manual.
  - h. Detailed breakdown of Hourly Labor Rates for all classifications of labor to be used on the project.
  - i. Completed and signed Interim Waiver and Release of Claims form.
  - j. Completed and signed Interim Waiver and Release of Claims form(s) from all primary and secondary lower tier subcontractors and or suppliers.
5. Progress Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the progress Application for Payment include the following:
- a. Completed and signed Interim Waiver and Release of Claims form.
  - b. Completed and signed Interim Waiver and Release of Claims form(s) from all primary and secondary lower tier subcontractors and or suppliers.
6. Final Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
- a. Completed and signed Final Waiver and Release of Claims form.
  - b. Completed and signed Final Waiver and Release of Claims form(s) from all primary and secondary lower tier subcontractors and or suppliers.

## **PART 2 – PRODUCTS (NOT USED)**

## **PART 3 – EXECUTION (NOT USED)**

### **END OF SECTION**



**SECTION 01 20 00**  
**PROJECT MEETINGS**

**PART 1 – GENERAL**

**1.01 REQUIREMENTS INCLUDED**

- A. This section specifies administrative and procedural requirements for project meetings including but not limited to:
  - 1. Progress Meetings.
  - 2. Pre-Installation Meetings.
  - 3. Superintendent's Meetings.

**1.02 DESCRIPTION**

- A. Work included: To enable orderly review during progress of the Work, and to provide for systematic discussion of construction issues, the Contracting Agency or its authorized representative will conduct project meetings throughout the construction period.

**1.03 PRECONSTRUCTION CONFERENCE**

- A. Prior to the commencement of Work at the Site, a preconstruction conference will be held at a mutually agreed time and place. The conference shall be attended by the Contractor's Project Manager, its superintendent, and its subcontractors as the Contractor deems appropriate. Other attendees will be:
  - 1. Engineer and the Resident Project Representative.
  - 2. Representatives of the Owner.
  - 3. Governmental representatives as appropriate.
  - 4. Representatives from utilities that may be impacted during construction.
  - 5. Others as requested by Contractor, Owner, or Engineer.
- B. The Preconstruction conference will be held within 5 working days of the notice to proceed.
- C. The Contractor shall bring the preconstruction conference submittals in accordance with Section 01 33 00, "Contractor Submittals."
- D. The purpose of the conference is to designate responsible personnel and establish a Working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The complete agenda will be furnished to the

Contractor prior to the meeting date. However, the Contractor should be prepared to discuss all of the items listed below.

1. Status of Contractor's insurance and bonds.
2. Contractor's tentative schedules.
3. Transmittal, review, and distribution of Contractor's submittals.
4. Processing applications for payment.
5. Maintaining record documents.
6. Critical Work sequencing.
7. Field decisions and Change Orders.
8. Permit conditions and compliance.
9. Use of Site, office and storage areas, security, housekeeping, and Owner's needs.
10. Major equipment deliveries and priorities.
11. Contractor's assignments for safety and first aid.
12. Daily Report Form which the Engineer will furnish.
13. Submittal Transmittal Form which the Engineer will furnish.
14. Traffic Control Plans.
15. Parking.
16. Site access.
17. Excavation Support.
18. Contractor's Work Plan: The Work plan and schedule must be completed and submitted at the Preconstruction conference. See Section 01 12 16 and Section 01 32 20 for detailed requirements. The Work plan must be coordinated with the project schedule and include:
  - a. Name of project superintendent and experience.
  - b. Describe the project, access, staging, and lay down needs for the Work.
  - c. Describe the handling of materials. Show locations of stockpiles, covering methods, and expected end use.
  - d. Describe the water needs, mixing, delivery, equipment storage, methods, and monitoring activities. Provide a contingency plan for leaks, breakouts, or clean-up needs and TESC installations.

19. Dewatering Plan.

20. Health and Safety Plan: The contractor shall develop, implement, maintain, supervise and be responsible for a Health and Safety Plan (HASP) to meet all state, federal, and local health and safety requirements. The Contractor must provide a copy of the HASP at the project site and conduct training.

- E. The Engineer will preside at the preconstruction conference and will arrange for keeping and distributing the minutes to all persons in attendance.
- F. The Contractor and its subcontractors should plan on the conference taking no less than four (4) hours. The meeting will cover the items listed in paragraphs 3 and 4 above. The Contractor, Engineer, AND Owner and will review the Drawings and Specifications.

**1.04 PROGRESS MEETINGS**

- A. The Contracting Agency will schedule and administer Project progress meetings regularly throughout the project. Times and dates shall be agreed upon by the Owner and Contractor.
- B. Project meetings shall be held at a location designated by the Contracting Agency.
- C. The Contracting Agency will make physical arrangements for meetings, prepare agenda with copies for participants, preside at meetings; record minutes and distribute copies within five (5) working days to participants and those affected by decisions made at meetings.
- D. Attendance: Contracting Agency, Contractor's Project Manager and Project Superintendent all as appropriate to address agenda topics for each meeting. Major subcontractors and suppliers shall attend when requested by the Contracting Agency or Contractor.
- E. At each Progress Meeting Contractor and other contractors in attendance shall present to the Contracting Agency any questions that have arisen as a result of carefully examining the Drawings and Specifications. Contracting Agency shall present any guides, advice or administrative procedures they wish to have followed for orderly and expeditious prosecution and administration of the Work. Agenda shall include at least the following:
  - 1. Review and correct or approve minutes of the previous Progress Meeting.
  - 2. Review other items of significance that could affect progress.
  - 3. Include topics for discussion as appropriate to the current status of the Project.
  - 4. Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Construction Schedule, whether on time, ahead or behind schedule. Determine how activities behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities shall be completed within the Contract time.

5. Review the present and future needs of each entity present, including such items as:

- a. Interface requirements.
- b. Time.
- c. Sequences of the Work.
- d. Deliveries.
- e. Off-site fabrication problems.
- f. Access.
- g. Site utilization.
- h. Temporary facilities and services.
- i. Hours of Work.
- j. Hazards and risks.
- k. Housekeeping.
- l. Quality and Work standards.
- m. Change Orders.
- n. Documentation of information for payment requests.
- o. Maintenance of Plant Operation Plan.

F. The Contracting Agency will provide, if required, the only recording device allowed during the conduct of these meetings. Contractor or other contractor(s) will not be allowed to utilize any recording equipment.

G. Contractor will not be allowed to supplement their project representation at any progress meeting with personnel representing Contractor unless approved by the Contracting Agency in matters of legality.

## **1.05 PRE-INSTALLATION MEETINGS**

A. Contractor will schedule a pre-installation conference at the Project site, with notification provided to Contracting Agency, before each construction activity commences that requires coordination with other Work.

B. Attendees: Authorized representatives of Owner, Contracting Agency and their consultants; Contractor, Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow shall attend the meeting.

- C. Review conditions of installation, preparation and installation procedures and coordination with related Work.
- D. Review the progress of other construction activities and preparations for the particular activity under consideration at each Pre-Installation Meeting, including requirements for:
  - 1. Contract Documents.
  - 2. Related Change Orders.
  - 3. Shop Drawings, Product Data and Quality Control Samples.
  - 4. Manufacturer's written recommendations.
  - 5. Options.
  - 6. Purchases.
  - 7. Deliveries.
  - 8. Space and access limitations.
  - 9. Maintenance of Plant Operation Plan and review of plant operation needs.
  - 10. Contract Compliance.
  - 11. Possible conflicts.
  - 12. Compatibility of materials.
  - 13. Acceptability of substrates.
  - 14. Time schedules.
  - 15. Weather limitations.
  - 16. Warranty requirements.
  - 17. Temporary facilities and controls.
  - 18. Regulations and authorities having jurisdiction.
  - 19. Inspection and testing requirements.
  - 20. Required performance results.
  - 21. Recording requirements.
  - 22. Protection of construction and personnel.

- E. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

#### **1.06 CONTRACTOR'S COORDINATION MEETING**

- A. Contractor may schedule Contractor Coordination Meetings as deemed appropriate to ensure the Work is being completed in accordance with the Contract Documents.
- B. Called meetings and or special meetings shall be held as required by progress of the Work.
- C. Location of Contractor's Coordination Meetings: Contractor's field office or as designated by Contractor.
- D. Attendance:
  - 1. Contractor working onsite or necessary for coordination of upcoming work (mandatory).
  - 2. Other contractor's representative as required by Contractor or job condition.
  - 3. Representative of contractors not yet mobilized as required by Contractor.
  - 4. Suppliers as required.
- E. Agenda:
  - 1. Review and approve minutes of previous meetings.
  - 2. Review Work progress since previous meeting.
  - 3. Review upcoming Work.
  - 4. Problems / Conflicts.
  - 5. Old business / New business.
  - 6. Contract Compliance.

#### **PART 2 – PRODUCTS (NOT USED)**

#### **PART 3 – PRODUCTS (NOT USED)**

#### **END OF SECTION**

**SECTION 01 29 00**  
**MEASUREMENT AND PAYMENT**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. The following measurement and payment descriptions supersede descriptions included in the APWA/WSDOT Standard Specifications unless noted or referenced. Payment for the various items of the Bid Schedule(s), as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the WORK all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of permits and cost of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the State of Washington and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefore shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.
- B. This section covers the method of measuring completed work for payments to the Contractor.
- C. Measurement shall be as described under each bid item in Part 2 herein.
- D. Payment for the various items on the Bid Schedule, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals as necessary to complete the various items of the work all in accordance with the requirements of the Contract Documents, including all appurtenances thereto and including all costs of compliance with the regulations of public agencies having jurisdiction, including safety and health requirements of the Occupational Safety and Health Administration of the U. S. Department of Labor (OSHA) and the Washington Industrial Safety and Health Act (WISHA) Department of Labor and Industries. No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs thereof shall be included in the prices named in the Bid Schedule for the various items of work.
- E. Indirect costs, including but not limited to, supervision and overhead, profit, the general conditions specified in the Contract, all shall be allocated to each bid item as applicable for work defined in the bid item. No separate payment will be made to the Contractor for these items.
- F. No payment will be made for work and materials that are not in compliance with the requirements of the Contract Documents.

## **1.02 DESCRIPTION OF BID ITEMS**

- A. Bid item descriptions are provided to delineate the work and represent an approximation of the scope of work. The prices named in the Form of Bid shall include all work necessary for a complete and functional system, in place and operating, whether included in the bid item description or not.

## **1.03 MINOR CHANGE**

- A. WSDOT Section 1-04.4(1) is supplemented with the following:
  - 1. Minor Change shall be paid per force account in accordance with WSDOT Section 1 09.6.
  - 2. For the purpose of providing a common Proposal for all Bidders, the Contracting Agency has entered an amount for "Minor Change" in the Proposal to become part of the total bid by the Contractor. Each incidence of Minor Change shall not exceed \$10,000.

## **1.04 SUSPENSION OF WORK**

- A. WSDOT Section 1-08.6 is supplemented with the following:
  - 1. Suspension of Work shall be measured per unworkable days as determined in WSDOT Section 1-08.6, or as directed by the Engineer.
  - 2. For the purpose of providing a common Proposal for all Bidders, the Contracting Agency has entered an amount of 3 unworkable days for "Suspension of Work" in each Bid Schedule of the Proposal to become part of the total bid by the Contractor.

## **1.05 SCHEDULE OF VALUES**

- A. The Contractor shall submit a preliminary Schedule of Values to the Owner at the Preconstruction Meeting. Contractor shall submit a final Schedule of Values at least 15 days prior to submitting the first Application for Payment.
- B. The Contractor's Schedule of Values shall be in a form acceptable to the Owner and have at least the following level of detail: site mobilization, for Construction Scheduling, for bonds and insurance, for final cleanup and for final deliverables. Subdivide final deliverables into: Record Drawings; Operation and Maintenance Manuals with Parts Lists; and Special Guarantees. Include the appropriate Specification Section and paragraph number for each line item. Subdivide major trades or portions of the work into multiple line items that relate to observable milestones to aid monthly progress evaluations.
- C. Form and Content of Schedule of Values:
  - 1. The major line items of the Schedule of Values shall be the Bid Items listed in the Bid Schedule.
  - 2. Identify each line item in the Schedule of Values with number and title of the major Specification Sections. Schedule shall include payment items arranged by



specification number. Testing-startup activities and O&M Manuals shall have separate items. The Schedule of Values shall assign a fair, reasonable, and equitable dollar value for each activity on the Contractor's construction schedule submitted pursuant to the requirements of the Contract Documents. The Schedule of Values shall include anticipated progress payments for each item in the bid schedule through the final payment. In addition, a detailed breakdown of lump sum prices shall be included in the Schedule of Values.

3. The detailed breakdown of each structure shall include demolition work, concrete and masonry work, metals, mechanical, electrical, piping, painting, instrumentation and controls, testing, start-up, and operations as approved by the Owner.
4. The Schedule of Values shall specifically indicate installed cost for materials and equipment for each bid and sub-bid item.
5. Each activity's assigned value shall consist of labor, equipment and materials cost, and a pro rata contribution to overhead and profit. Breakdown shall be so organized as to facilitate assessment of work and payment of subcontractors.
6. The sum of the assigned values shall equal the lump sum price of the activity.
7. The sum of all values listed in the schedule shall equal the total contract sum.
8. If, in the opinion of the Project Representative or Owner, the Schedule of Values is not balanced, the Contractor shall provide documentation substantiating the cost allocations of those activities believed to be unbalanced. Cost allocation will be considered unbalanced if an activity on the construction schedule has been assigned a disproportionate allocation of labor, direct, or overhead and profit costs which result in progress payment request(s) which would create a condition where insufficient funds are available to complete the unfinished work. Upon request by Owner, support values shall be given with data that will substantiate their accuracy. Upon Owner's request, the Contractor shall submit additional detailed cost information.
9. No single item of worth listed in the cost breakdown shall exceed 5 percent of the total lump sum cost. Items exceeding 5 percent shall be broken down into further detail,
10. Upon acceptance of the Schedule of Values, it shall be used as a basis for processing all payment requests.

D. Review and Resubmittal:

1. After review by Owner, revise and resubmit schedule as required.
2. Resubmit revised schedules in same manner.

E. See the General Requirements for additional requirements.

## **1.06 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT**

### **A. Partial Payment:**

1. No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings and preliminary operation and maintenance manuals are acceptable to Engineer.
2. No partial payment will be made for materials and equipment stored in unsatisfactory conditions, as determined by the Project Representative.
3. Owner will provide a 90 percent partial payment of cost of materials for materials and equipment stored on project site with an individual value greater than \$5,000.
4. A vendor or supplier invoice will be required to document that Contractor has made payment to vendor or supplier.
5. For items on which progress payments will be requested for stored materials, break down the values into:
  - a. The cost of materials, delivered, and unloaded.
  - b. The total installed value.

- B. Final Payment: Will be made only for products incorporated in Work less retainage; remaining products, for which partial payments have been made, shall revert to Contractor unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

## **PART 2 – BID ITEMS**

### **2.01 GENERAL**

- A. The Bid Amounts for each Bid Item will be used for comparative bid analysis. The Bid amounts will also form the basis of monthly progress payments. Each Lump Sum bid amount will undergo further breakdown as described later in this section. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item (work phase) as shown and specified.

## **BID SCHEDULE A**

### **2.02 BID ITEM 1: “MOBILIZATION AND DEMOBILIZATION” PER LUMP SUM**

- A. Schedule A Mobilization shall consist of preconstruction expenses and the cost of preparatory work and operations performed by the Contractor, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the Wastewater Treatment Plant (WWTP) project site; for the establishment of offices, buildings, and other facilities necessary for work; for premiums on bonds and insurance for the WWTP; and for work and operations which Contractor must perform or costs

Contractor must incur before beginning production work on the various items at the WWTP site for Schedule A work. Mobilization costs for subcontracted work shall be considered to be included.

1. Items that are not to be included in this item include but are not limited to:
  - a. Any portion of the work covered by specific bid item or incidental work which is to be included in a bid item or items.
  - b. Profit, interest, on borrowed money, overhead, or management costs.
  - c. Schedule B mobilization costs.
2. The lump sum contract price for "Mobilization" partial payments will be made in accordance with Section 1-09.7 of the Standard Specifications.

#### **2.03 BID ITEM 2: "MINOR CHANGE"**

- A. See WSDOT Special Provisions, for description of this Schedule A Bid Item.

#### **2.04 BID ITEM 3: "SCHEDULE A OF MBR TREATMENT FACILITY UPGRADE" PER LUMP SUM**

- A. The lump sum contract price shall be full payment for all the Schedule A work of this Contract, not included in the other bid items, to make upgrades to the Tulalip Tribe's WWTP. This includes equipment installation work, piping, all Schedule A treatment plant process facilities, installation of mixer, process piping, electrical, instrumentation, testing, operator training, start-up, O&M manual preparation, and commissioning, all in accordance with the Contract Documents.

#### **2.05 BID ITEM 4: "MCC 3A & 3B, BLOWER VFDS, PLC PANELS LCP 1000, LCP-2000, LCP-2014 AND LCP-3600" PER LUMP SUM**

- A. The lump sum contract price shall be full payment for all the work to supply and install MCC 3A & 3B, Blower VFDS, PLC panels LCP 1000, LCP-2000, LCP-2014 and LCP-3600 at the headworks. This includes equipment installation work, equipment, electrical, conduit, control panels, testing, operator training, start-up, O&M manual preparation, and commissioning, all in accordance with the Contract Documents.

#### **2.06 BID ITEM 5: "HEADWORKS DRUM SCREEN SUPPLY AND INSTALLATION" PER LUMP SUM**

- A. The lump sum contract price shall be full payment for all the work to supply and install the drum screen at the headworks. This includes equipment installation work, piping, equipment, electrical, conduit, control panel, instrumentation, testing, operator training, start-up, O&M manual preparation, and commissioning, all in accordance with the Contract Documents.

**2.07 BID ITEM 6: “KUBOTA MBR SUBMITTAL DURING CONSTRUCTION” PER LUMP SUM**

- A. Lump Sum contract price shall be payment for Kubota provided “Submittal During Construction” as specified in 46 11 30, 1.03. Contractor costs associated with the rest of the MBR supply and installation shall be included in Schedule B.

**2.08 DESCRIPTION OF ADDITIVE BID ITEM**

- A. Additive Bid Item 1 – “Permeate Piping Between MBR Building and Effluent Building”, per Lump Sum.
  - 1. The lump sum price shall include all cost to excavate, install piping, backfill, and hydroseed the installation shown on C2. This item may be included in the evaluation of bids for award of the contract. The Owner may elect to include it in the contract or not include it. Contractor shall price accordingly, testing, start-up, O&M manual preparation, and commissioning, all in accordance with the Contract Documents.

**BID SCHEDULE B**

**2.09 BID ITEM 1: “MOBILIZATION AND DEMOBILIZATION” PER LUMP SUM**

- A. Schedule B Mobilization shall consist of preconstruction expenses and the cost of preparatory work and operations performed by the Contractor, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the Wastewater Treatment Plant (WWTP) project site; for the establishment of offices, buildings, and other facilities necessary for work; for premiums on bonds and insurance for the WWTP; and for work and operations which Contractor must perform or costs Contractor must incur before beginning production work on the various items at the WWTP site for Schedule A work. Mobilization costs for subcontracted work shall be considered to be included.
- B. Items that are not to be included in this item include but are not limited to:
  - 1. Any portion of the work covered by a specific bid item or incidental work which is to be included in a bid item or items.
  - 2. Profit, interest, on borrowed money, overhead, or management costs.
  - 3. Schedule A mobilization costs.
- C. The lump sum contract price for “Mobilization” partial payments will be made in accordance with Section 1-09.7 of the Standard Specifications.

**2.10 BID ITEM 2: “MINOR CHANGE”**

- A. See WSDOT Special Provisions for description of this Schedule B Bid Item.

**2.11 BID ITEM 3: “SUPPLY AND INSTALLATION OF AIR BLOWERS 1 AND 3” PER LUMP SUM**

- A. The lump sum contract price shall be full payment for supply and installation of Air Blowers 1 and 3. This includes installation testing, operator training, start-up, O&M manual preparation, and commissioning, all in accordance with the Contract Documents. Electrical conduit and controls work for the blowers shall not be included in this bid item price.

**2.12 BID ITEM 4: “SUPPLY AND INSTALLATION OF MLR PUMPS 1, 1/3 AND 3” PER LUMP SUM**

- A. The lump sum contract price shall be full payment for supply and installation of MLR pumps 1, 1/3, and 3. This includes installation testing, operator training, start-up, O&M manual preparation, and commissioning, all in accordance with the Contract Documents. Electrical conduit and controls work for the blowers shall not be included in this bid item price.

**2.13 BID ITEM 5: “SCHEDULE B OF MBR TREATMENT FACILITY UPGRADE” PER LUMP SUM**

- A. The lump sum contract price shall be full payment for all Schedule B work of this Contract, not included in the other Schedule B bid items, to make upgrades to the Tulalip Tribe’s WWTP. This includes equipment installation work, piping, all Schedule B treatment plant process facilities, installation of equipment, piping, electrical, instrumentation, testing, operator training, start-up, O&M manual preparation, and commissioning, all in accordance with the Contract Documents.

**2.14 BID ITEM 6: “KUBOTA MBR EQUIPMENT SUPPLY” PER LUMP SUM**

- A. Lump Sum contract price shall be payment for all Kubota MBR equipment supply, START-UP assistance, O&M manual and operator training. Any Construction Contractor costs associated with installation of MBR equipment, administering contract and coordinating equipment delivery, storage and other activities shall be included in Schedule B Bid Item 5.

**2.15 BID ITEM 7: “SUPPLY AND INSTALLATION OF PERMEATE PUMPS AT MBRS 1, 2, 3 AND 4” PER LUMP SUM**

- A. The lump sum contract price shall include supply and installation of four Permeate Pumps including all work in pump specifications, drawings and testing, operator training, start-up, O&M manual preparation, and commissioning, all in accordance with the Contract Documents. Electrical, conduit and controls work for the pumps shall not be included in the bid item price.

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 32 20**  
**CRITICAL PATH METHOD (CPM) CONSTRUCTION SCHEDULE**

**PART 1 – GENERAL**

**1.01 GENERAL**

- A. The Contractor shall schedule the Work in accordance with this section.
- B. Development of the schedule, monthly payment requisitions and project status reporting requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling.
- C. The CPM schedule and related reports should be prepared with the current version of Primavera Project Planner (P3) or SureTrak software.
- D. Until award of Schedule B, Contractor is not required to include Schedule B in submittals.

**1.02 DEFINITIONS**

- A. CPM Scheduling: The term shall be interpreted to be generally as outlined in the Association of General Contractors (AGC) publication, "The Use of CPM in Construction," except that either "i-j" arrow diagrams or precedence diagramming format may be utilized. In the case of conflicts between this section and the AGC document, this section shall govern.
- B. Float: Unless otherwise indicated herein, float and total float are synonymous. Total float is the period of time measured by the number of working days each non-critical path activity may be delayed before it and its succeeding activities become part of the critical path. If a non-critical path activity is delayed beyond its float period, then that activity becomes part of the critical path and controls the end date of the Work. Thus, delay of a non-critical path activity beyond its float period will cause delay to the project itself.

**1.03 SCHEDULING QUALIFICATION SUBMITTALS**

- A. Contractor shall submit a statement of computerized CPM capability within ten (10) working days after Notice to Proceed to verify that either: (1) the Contractor has in-house capability qualified to use CPM techniques and the Primavera P6 or SureTrak software or (2) that the Contractor will arrange for the services of a CPM consultant so qualified. In either event the statement shall identify the individual who will perform the CPM scheduling and shall describe the construction projects required below. The statement shall also identify the contact persons for the referenced projects with current telephone and address information.
- B. Criteria: The individual performing scheduling shall have successfully applied computerized CPM technique to at least two (2) projects of similar nature, scope, and value not less than one-half the Total Bid Price of this project.

#### **1.04 INITIAL SCHEDULE SUBMITTALS**

- A. Where submittals are required hereunder, the Contractor shall submit four (4) copies of each submittal item (or PDF).
- B. The Contractor shall submit two short term schedule documents at the Preconstruction Conference which serve as the Contractor's plan of operation for the initial 40-working day period of the Contract Times and identify the manner in which the Contractor intends to complete the Work within the Contract Times.
- C. Forty-working-day Plan of Operation: During the initial 40 working days of the Contract Times, the Contractor shall conduct operations in accordance with a 40 working-day bar chart type schedule. The chart so prepared shall show accomplishment of the Contractor's early activities (mobilization, permit acquisition, submittals necessary for early material and equipment procurement, submittals necessary for long lead equipment procurement, CPM submittals, initial sitework and other submittals and activities required in the first 40 working days).
- D. Include Maintenance of Plant Operation submittals outline based on projected wastewater flow disruptions.
- E. Project Overview Bar Chart: The overview bar chart shall indicate the major components of the Work and the sequence relations between major components and subdivisions of major components. The overview bar chart shall indicate the relationships and time frames in which the various components of the Work will be made substantially complete and placed into service in order to meet the required milestones. Planned durations and start dates shall be indicated for each Work item subdivision. Each major component and subdivision component shall be accurately plotted on time scale sheets not to exceed 36 inches by 60 inches in size. No more than four (4) sheets shall be employed to present this overview information.
- F. The Engineer and the Contractor shall meet to review and discuss the 40 working-day plan of operation and project overview bar chart within five (5) working days after submittal to the Engineer. The Engineer's review and comment on the schedules will be limited to conformance with the sequencing and milestone requirements in the Contract Documents. The Contractor shall make corrections to the schedules necessary to comply with the requirements and shall adjust the schedules to incorporate any missing information requested by the Engineer.

#### **1.05 CPM SCHEDULE SUBMITTALS**

- A. Original CPM Schedule Submittal: Within ten (10) working days after the commencement date stated in the Notice to Proceed, the Contractor shall submit for review by the Engineer a hard copy of the CPM schedule and the computerized schedule report tabulations. The Contractor shall also submit a CD that contains the schedule submittal information. The data shall be compatible with Primavera P6 or SureTrak to generate network diagrams and schedule reports identical to the hard copies submitted. This submittal shall have already been reviewed and approved by the Contractor's Project Manager, superintendent, and estimator prior to submission. The CPM schedule shall be a time scaled network diagram of the "i-j" activity-on-arrow or precedence type. The network



diagram shall describe the activities to be accomplished and their logical relationships and shall show the critical path.

B. The computerized schedule report tabulations shall include the following:

1. Report of activities sorted by activity number: Activity numbers, where practical, shall correlate to the area numbers designated on the Contract Drawings as further defined in Section 01 10 00, "Summary of Work."
2. Report of activities sorted by early start date.
3. Report of activities sorted by total float.
4. Report of activities sorted by responsibility code. Responsibility codes shall be established for the Contractor, Engineer, Owner, Subcontractors, Suppliers, etc. These codes shall be identified in the Network Diagram.
5. A successor-predecessor report which shall identify the successor and predecessor activities for each activity and ties between schedule activities.
6. The Contractor's attention is directed to Section 01 12 16, "Work Sequence." The Contractor shall incorporate all coordination and schedule constraints.

C. Analysis:

1. Early Completion:

- a. The Contractor may show early completion on the original CPM submittal if that is its plan.
- b. An original CPM submittal showing early completion shall either be accompanied by:
  - 1) Request for change of Contract Times at zero change of Contract Price, accompanied by documentation demonstrating that the Bid was based on early completion, or
  - 2) Demonstration in the submittal that the time difference between early completion and the original Contract Time is total float.
- c. An early completion schedule unaccompanied by one of these will not be accepted.
- d. The Engineer will analyze a request for Change Order in accordance with the General Conditions.

D. Float Ownership: Neither the Owner nor the Contractor owns the float time. The project owns the float time. Liability for delay to the project completion date rests with the party causing the delay. For example, if Party A is responsible for consuming a portion of the float time and Party B later consumes the remainder of the float time plus additional time

beyond the float time, Party B is responsible for the time that is a delay past the completion date. Party A would not be responsible for any delay since it did not consume all the float time, additional float time remained after its delay, and the completion date was unaffected by its tardiness.

- E. Original CPM Schedule Review Meeting: The Contractor shall, within 20 working days from the commencement date stated in the Notice to Proceed, meet with the Engineer to review the original CPM schedule submittal. The Contractor shall have the Project Manager, superintendent, and the scheduler in attendance. The meeting will take place over a one (1) day period. The Engineer's review will be limited to conformance with the Contract Documents. However, the review may also include:
- F. Clarifications of the design intent, process, and startup requirements.
- G. Directions to include activities and information missing from the submittal.
- H. Requests to the Contractor to clarify and revise the schedule.
- I. Revisions to the Original CPM Schedule: Within 30 working days after the commencement date stated in the Notice to Proceed, the Contractor shall revise the original CPM schedule submittal to address review comments from the original CPM schedule review meeting and resubmit the network diagrams and reports for the Engineer's review. The Engineer, within ten (10) working days from the date that the Contractor submitted the revised schedule will either (1) accept the schedule as submitted, or (2) advise the Contractor in writing to review any part or parts of the schedule which either do not meet the requirements or are unsatisfactory for the Engineer to monitor the progress and status of Work or evaluate monthly payment requests by the Contractor. The Engineer may accept the schedule conditional upon the first monthly CPM schedule update correcting deficiencies identified. When the schedule is accepted, it shall be considered as the "Original CPM Construction Schedule" until an updated schedule has been submitted. The Engineer reserves the right to require that the Contractor adjust, add to, or clarify any portion of the schedule which may later be discovered to be insufficient for the monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- J. Acceptance of Original CPM Schedule:
  - 1. Acceptance of the Contractor's original CPM schedule by the Engineer and Owner will be based solely upon compliance with the requirements. By way of the Contractor assigning activity durations and proposing the sequence of the Work, the Contractor agrees to utilize sufficient and necessary management and other resources to perform Work in accordance with the schedule. Upon submittal of a schedule update, the updated schedule shall be considered the "current" project schedule.
  - 2. Submission of the Contractor's original CPM schedule to the Engineer shall not relieve the Contractor of total responsibility for scheduling, sequencing, and pursuing the Work to comply with the requirements of the Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

K. Monthly Updates and Periodic CPM Schedule Submittals:

1. Following acceptance of the Contractor's original CPM schedule, the Contractor shall monitor the progress of the Work and adjust the schedule each month to reflect actual progress and any changes in planned future activities relative to the Original CPM Schedule, which shall be plotted together. Each schedule update submittal shall be complete including information requested in the original schedule submittal and be in the schedule report format indicated below. Each update shall continue to show Work activities including those already completed. Completed activities shall accurately depict "as built" information by indicating when the Work was actually started and completed.
2. Neither the submission nor the updating of the Contractor's original schedule submittal nor the submission, updating, change, or revision of any other report, curve, schedule, or narrative submitted by the Contractor, nor the Engineer's review or acceptance of any such report, curve, schedule, or narrative shall have the effect of amending or modifying in any way the Contract Times or milestone dates or of modifying or limiting in any way the Contractor's obligations under the Contract. Only a signed, fully executed Change Order can modify contractual obligations.
3. The monthly schedule update submittal will be reviewed with the Contractor during the first construction progress meeting held each month. The goal of these meetings is to enable the Contractor and the Engineer to initiate appropriate remedial action to minimize any known or foreseen delay in completion of the Work and to determine the amount of Work completed since the last schedule update. The status of the Work will be determined by the percent complete of each activity in the updated CPM schedule. These meetings are considered a critical component of the overall monthly schedule update submittal, and the Contractor shall have appropriate personnel attend. As a minimum, the Contractor's Project Manager and general superintendent shall attend these meetings. The Contractor shall plan on the meeting taking no less than 2 hours. Within 7 working days after the monthly progress meeting, the Contractor shall submit the revised CPM schedule, the revised CPM computerized tabulations as noted in this section, the revised successor/predecessor report, the Project Status Reports as defined below and the Contractor's Application for Payment. Within five (5) working days of receipt of the revised submittals, the Engineer will either accept or reject the monthly schedule update submittal. If accepted, the percent complete in the monthly update shall be the basis for the Application for Payment to be submitted by the Contractor. If rejected, the update shall be corrected and resubmitted by the Contractor before the Application for Payment for the update period will be processed.
4. Schedule Revisions: The Contractor shall highlight or otherwise identify changes to the schedule logic or activity durations made from the previous schedule. The Contractor shall modify any portions of the CPM schedule which become infeasible because activities are behind schedule or for any other valid reason.

## 1.06 CHANGE ORDERS

- A. Upon approval of a Change Order or upon receipt by the Contractor of authorization to proceed with additional Work, the change shall be reflected in the next submittal of the CPM Schedule. The Contractor shall utilize a sub-network in the schedule depicting the

changed Work and its effect on other activities. This sub-network shall be tied to the main network with appropriate logic so that a true analysis of the critical path can be made. Whenever the Contractor believes that a Change Order will extend the Contract Times, the sub-network analysis herein shall be submitted with the price proposal for the change. If the Contractor does not submit the sub-network demonstrating that the change affects the Contract Times, then no subsequent claim for additional time due to the change will be accepted.

## **1.07 CPM STANDARDS**

- A. Construction Schedules: Construction schedules shall include a graphic network diagram and computerized schedule reports as required below for status reporting.
- B. Networks: The CPM network shall be in a form of a time scaled “i-j” activity-on-arrow or precedence type diagram and may be divided into a number of separate sheets with suitable match lines relating the interface points among the sheets. Individual sheets shall not exceed 36 inches by 60 inches.
- C. Construction and procurement activities shall be presented in a time-scaled format with a calendar time line along the entire sheet length. Each activity arrow or node shall be plotted so that the beginning and completion dates of each activity are accurately represented along the calendar time line. Every activity shall use symbols that clearly distinguish between critical path activities, non-critical activities, and free float for each non-critical activity. Activity items shall be identified by their activity number, responsibility code, duration, and dollar value. Non-critical path activities shall show total float time in scale form by utilizing a dotted line or some other graphical means.
- D. Duration Estimates: The duration estimate for each activity shall be computed in working days and shall represent the single best estimate considering the scope of the Work and resources planned for the activity. Except for certain non-labor activities such as curing of concrete or delivery of materials, activity duration shall not exceed ten (10) working days nor be less than one working day, unless otherwise accepted by the Engineer.

## **1.08 SCHEDULE REPORT FORMAT**

- A. Schedule Reports: Schedule reports shall be prepared based on the CPM schedule, shall be submitted on paper and CD, depending on file size, and shall include the following minimum data for each activity:
  - 1. Activity numbers and responsibility codes.
  - 2. Work Order No.
  - 3. CIP No.
  - 4. Estimated activity duration.
  - 5. Activity description.
  - 6. Activity percent completion.

7. Early start date (calendar dated).
  8. Early finish date (calendar dated).
  9. Late start date (calendar dated).
  10. Late finish date (calendar dated).
  11. Status (whether critical).
  12. Total float for each activity.
  13. Free float for each activity.
- B. Project Information: Each Schedule Report shall be prefaced with the following summary data:
1. Project name.
  2. Contractor name.
  3. Type of tabulation.
  4. Project duration.
  5. Contract Times (as revised by Change Orders).
  6. The commencement date stated in the Notice to Proceed.
  7. The data date and plot date of the CPM Schedule.
  8. If an update, cite the new schedule completion date.

#### **1.09 PROJECT STATUS REPORTING**

- A. The Contractor shall furnish monthly project status reports (overview bar chart and a written narrative report) in conjunction with the revised CPM schedules as indicated above. Status reporting shall be in the form below.
- B. The Contractor shall prepare and submit monthly an overview bar chart schedule of the major project components. The overview bar chart schedule shall be a summary of the current CPM schedule (original and as updated and adjusted throughout the entire construction period). The major project components shall be represented as time bars which shall be subdivided into various types of Work including demolition, excavation and earthwork, yard piping, concrete construction, and mechanical, electrical and instrumentation installations. Major components shall include each new structure by area designation, sitework, modifications to existing structures, tie-ins to existing facilities, and plant startups.
- C. Each major component and subdivision shall be accurately plotted consistent with the project overview bar chart above. It shall represent the same status indicated by early start

and finish activity information contained in the latest update of the CPM schedule. In addition, a percent completion shall be indicated for each major component and subdivision. The initial submittal of the overview bar chart schedule shall be made at the time that the revised original CPM schedule is submitted to the Engineer. The Contractor shall amend the overview schedule to include any additional detail required by the Engineer. The Contractor shall include any additional information requested by the Engineer at any time during the construction of the Work.

- D. The Contractor shall prepare monthly written narrative reports of the status of the project for submission to the Engineer. Status reports shall include:
1. The status of major project components (percent complete, amount of time ahead or behind schedule) and an explanation of how the project will be brought back on schedule if delays have occurred.
  2. The progress made on critical activities indicated on the CPM schedule.
  3. Explanations for any lack of Work on critical path activities planned for the last month.
  4. Explanations for any schedule changes, including changes to the logic and to activity durations.
  5. A list of the critical activities scheduled to be performed in the next two months.
  6. The status of major material and equipment procurement.
  7. The value of materials and equipment properly stored at the Site but not yet incorporated into the Work.
  8. Any delays encountered during the reporting period.
  9. An assessment of inclement weather delays and impacts to the progress of the Work.
- E. The Contractor may include any other information pertinent to the status of the Work. The Contractor shall include additional status information requested by the Engineer.

#### **1.10 INCLEMENT WEATHER PROVISIONS OF THE SCHEDULE**

- A. The Contractor's schedule shall include at least the number of working days of delay due to unusually severe weather as required by the Supplementary General Conditions.

#### **1.11 INCOMPLETE OR LATE SUBMITTALS**

- A. If any submittal required by this section is determined by the Engineer to be incomplete or is submitted later than required, the Engineer will reject any subsequent progress payment applications until such time that the submittal has been submitted and approved.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 33 00**  
**CONTRACTOR SUBMITTALS**

**PART 1 – GENERAL**

**1.01 GENERAL**

- A. Wherever submittals are required in the Contract Documents, submit them to the Engineer and Owner.
- B. Within 10 working days after the date of commencement as stated in the Notice to Proceed, the Contractor shall submit the following items for review:
  - 1. A preliminary schedule of Shop Drawings, Samples, and submittals.
  - 2. A list of permits and licenses the Contractor shall obtain, indicating the agency required to grant the permit and the expected date of submittal for the permit and required date for receipt of the permit.

**1.02 PRECONSTRUCTION CONFERENCE SUBMITTALS**

- A. At the preconstruction conference of the Contractor shall submit the following items to the Engineer for review:
  - 1. A revised schedule of Shop Drawings, Samples, and submittals.
  - 2. A list of permits and licenses the Contractor shall obtain, indicating the agency required to grant the permit, the expected date of submittal for the permit, and required date for receipt of the permit.
  - 3. A preliminary schedule of values.
  - 4. A 40-working-day plan of operation in accordance with Section 01 32 20, "Critical Path Method (CPM) Construction Schedule."

**1.03 SHOP DRAWINGS**

- A. Wherever called for in the Contract Documents or where required by the Engineer, the Contractor shall furnish five (5) copies plus one reproducible copy of each Shop Drawing or provide a PDF of the submittal. Shop Drawings may include detail design calculations, shop-prepared drawings, fabrication and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items. Whenever the Contractor is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of an engineer registered in the appropriate branch and in the State of Washington, unless otherwise indicated.
- B. Shop Drawing submittals shall be accompanied by the Engineer's standard submittal transmittal form, a reproducible copy of which is available from the Engineer. A submittal

without the form or where applicable items on the form are not completed will be returned for resubmittal.

C. Organization:

1. A single submittal transmittal form shall be used for each technical specification section or item or class of material or equipment for which a submittal is required. A single submittal covering multiple sections will not be acceptable, unless the primary specification references other sections for components. Example: if a pump section references other sections for the motor, shop-applied protective coating, anchor bolts, local control panel, and variable frequency drive, a single submittal would be acceptable. A single submittal covering vertical turbine pumps and horizontal split case pumps would not be acceptable.
2. On the transmittal form, index the components of the submittal and insert tabs in the submittal to match the components. Relate the submittal components to specification number and paragraph, Drawing number, detail number, schedule title, as applicable.
3. Unless indicated otherwise, terminology and equipment names and numbers used in submittals shall match those used in the Contract Documents.

D. Format:

1. Minimum sheet size shall be 8-1/2 inches by 11-inches. Maximum sheet size shall be 24 inches by 36 inches. Every page in a submittal shall be numbered in sequence. Each copy of a submittal shall be collated and stapled or bound, as appropriate. The Engineer will not collate sheets or copies.
2. Where product data from a manufacturer is submitted, clearly mark which model is proposed, with all pertinent data capacities, dimensions, clearances, diagrams, controls, connections, anchorage, and supports. Sufficient level of detail shall be presented for assessment of compliance with the Contract Documents. Copies of previously faxed information shall be avoided. Image quality of text and illustrations must be clear and legible. Scale drawings shall identify the scale ratio.
3. Each submittal shall be assigned a unique number. Submittals shall be numbered sequentially, and the submittal numbers shall be clearly noted on the transmittal. Original submittals shall be assigned a numeric submittal number. Resubmittals shall bear an alpha-numeric system which consists of the number assigned to the original submittal for that item followed by a letter of the alphabet to represent that it is a subsequent submittal of the original. For example, if submittal 25A requires a resubmittal, the first resubmittal will bear the designation "25B" and the second resubmittal will bear the designation "25C" and so on.

E. Disorganized submittals that do not meet the requirements of the Contract Documents will be returned without review.

F. Except as may otherwise be indicated, the Engineer will return PDFs of each submittal to the Contractor with comments noted thereon, within 15 working days following receipt by the Engineer. It is considered reasonable that the Contractor will make a complete and

acceptable submittal to the Engineer by the second submission of a submittal item. The Owner reserves the right to withhold monies due to the Contractor to cover additional costs of the Engineer's review beyond the second submittal.

- G. If a submittal is returned to the Contractor marked "NO EXCEPTIONS TAKEN," formal revision and resubmission will not be required.
- H. If a submittal is returned marked "MAKE CORRECTIONS NOTED," Contractor shall make the corrections on the submittal, but formal revision and resubmission will not be required.
- I. If a submittal is returned marked "REVISE and RESUBMIT," the Contractor shall revise it and shall resubmit the required number of copies. Resubmittal of portions of multi-page or multi-drawing submittals will not be allowed. For example, if a Shop Drawing submittal consisting of ten drawings contains one drawing noted as "REVISE and RESUBMIT," the submittal as a whole is deemed "REVISE and RESUBMIT," and ten drawings (or PDF) are required to be resubmitted.
- J. If a submittal is returned marked "SUBMIT SPECIFIED ITEMS," the Contractor shall submit the items requested with the required number of copies (or PDF).
- K. If a submittal is returned marked "REJECTED," it shall mean either that the proposed material or product does not satisfy the specification, the submittal is so incomplete that it cannot be reviewed, or is a substitution request not submitted in accordance with Section 01 60 00, "Product Requirements." In the first 2 cases, the Contractor shall prepare a new submittal and shall submit the required number of copies. In the latter case, the Contractor shall submit the substitution request according to Section 01 60 00, "Product Requirements."
- L. Resubmittal of rejected portions of a previous submittal will not be allowed. Every change from a submittal to a resubmittal or from a resubmittal to a subsequent resubmittal shall be identified and flagged on the resubmittal.
- M. Fabrication of an item may commence only after the Engineer has reviewed the pertinent submittals and returned copies to the Contractor marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED." Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as changes to the contract requirements.
- N. All submittals shall be carefully reviewed by an authorized representative of the Contractor prior to submission to the Engineer. Each submittal shall be dated and signed by the Contractor as being correct and in strict conformance with the Contract Documents. In the case of Shop Drawings, each sheet shall be so dated and signed. Any deviations from the Contract Documents shall be noted on the transmittal sheet. The Engineer will only review submittals that have been so verified by the Contractor. Non-verified submittals will be returned to the Contractor without action taken by the Engineer, and any delays caused thereby shall be the total responsibility of the Contractor.
- O. Corrections or comments made on the Contractor's Shop Drawings during review do not relieve the Contractor from compliance with Contract Drawings and Specifications. Review is for conformance to the design concept and general compliance with the Contract

Documents only. The Contractor is responsible for confirming and correlating quantities and dimensions, fabrication processes and techniques, coordinating Work with the trades, and satisfactory and safe performance of the Work.

#### **1.04 SAMPLES**

- A. The Contractor shall submit the number of samples indicated by the Specifications. If the number is not indicated, submit not less than two (2) samples. Where the amount of each sample is not indicated, submit such amount as necessary for proper examination and testing by the methods indicated.
- B. Unless otherwise indicated, samples, shall be submitted a minimum of ten (10) working days prior to ordering such material.
- C. Samples shall be individually and indelibly labeled or tagged, indicating the salient physical characteristics and manufacturer's name. Upon acceptance by the Engineer, one set of the samples will be stamped and dated by the Engineer and returned to the Contractor, one set of samples will be retained by the Engineer, and one set shall remain at the Site in the Engineer's field office until completion of the Work.
- D. Unless indicated otherwise, the Engineer will select colors and textures from the manufacturer's standard colors and standard materials, products, or equipment lines. If certain samples represent non-standard colors, materials, products, or equipment lines that will require an increase in Contract Times or Price, the Contractor shall clearly state so on the transmittal page of the submittal.

#### **1.05 MANUFACTURERS' O&M MANUAL**

- A. The Contractor shall submit operation and maintenance information for each item of mechanical, electrical, and instrumentation equipment in an organized manner in the O&M Manual. It shall be written so that it can be used and understood by the Owner's operation and maintenance staff. See Section 01 78 23 for complete requirements.
- B. Format:
  - 1. Each Technical Manual shall be bound in standard size three-ring hardcover binders labeled on the spine and cover with project name, Owner's project number, specification section numbers, equipment names, and equipment identification numbers.
  - 2. Each Binder shall contain its own detailed table of contents at the front, plus a summary level table of contents information for the other binders in a multi-binder set.
  - 3. Documents in binders shall be three-hole punched. No text shall be punched out and pages larger than 8-1/2 by 11 shall be folded to 8-1/2 by 11.

#### **1.06 SPARE PARTS LIST**

- A. The Contractor shall furnish to the Engineer three (3) identical sets of spare parts list information for mechanical, electrical, and instrumentation equipment. The spare parts list

shall include those spare parts that each manufacturer recommends be maintained by the Owner in inventory.

1. Sources and Pricing: The spare parts list shall include a current list price of each spare part. Each manufacturer or supplier shall indicate the name, address, and telephone number of its nearest outlet of spare parts to assist the Owner in ordering.
2. Format: The Contractor shall cross-reference spare parts lists to the equipment numbers designated in the Contract Documents. The spare parts lists shall be bound in standard size, three-ring, loose-leaf, vinyl plastic hard cover binders suitable for bookshelf storage. Binder ring size shall not exceed 2-1/2 inches.

## **1.07 RECORD DRAWINGS**

- A. See Section 01 78 39 "Record Drawings and Information" for complete requirements. The Contractor shall maintain one set of Drawings at the Site for the preparation of record drawings. On these, it shall mark every project condition, location, configuration, and any other change or deviation which may differ from the Contract Drawings at the time of award, including buried or concealed construction and utility features that are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of buried utilities that differ from the locations indicated, or that were not indicated on the Contract Drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or as Contractor is directed, to fully indicate the Work as actually constructed. These record drawings are the Contractor's representation of as-built conditions, shall include revisions made by addenda and change orders, and shall be maintained up-to-date during the progress of the Work. Red ink shall be used for alterations and notes. Notes shall identify relevant Change Orders by number and date.
- B. In the case of those drawings that depict the detail requirement for equipment to be assembled and the like, the record drawings shall be updated by indicating those portions which are superseded by change order drawings or final Shop Drawings, and by including appropriate reference information describing the change orders by number and the Shop Drawings by manufacturer, drawing, and revision numbers.
- C. Disorganized or incomplete record drawings will not be accepted. The Contractor shall revise them and resubmit within ten (10) working days.
- D. Record drawings shall be accessible to the Owner and Engineer during the construction period.
- E. Final payment will not be acted upon until the record drawings have been completed and delivered to the Engineer. Said up-to-date record drawings shall be in the form of a set of prints with carefully plotted information overlaid in one or more colors.
- F. Information submitted by the Contractor will be assumed to be correct, and the Contractor shall be responsible for the accuracy of such information.

## **1.08 QUALITY CONTROL (QC) SUBMITTALS**

- A. Quality control submittals are defined as those required by the Specifications to present documentary evidence to the Engineer that the Contractor has satisfied certain requirements of the Contract Documents.
- B. Unless otherwise indicated, QC submittals shall be submitted:
  - 1. Certificates of Successful Testing or Inspection.
  - 2. Manufacturers Installation Certification Form
  - 3. Statements of Qualification
  - 4. Field Samples
  - 5. Seismic Calculations
  - 6. Factory test reports
  - 7. Written Test Reports. See forms in Section 01 99 90, "Reference Forms."
- C. The Engineer will record the date that a QC submittal was received and review it for compliance with submittal requirements, the review procedures above for Shop Drawings and samples will be used.

## **1.09 MAINTENANCE OF PLANT OPERATION (MOPO)**

- A. MOPO form from Section 01 99 90 is to be submitted with detailed steps and activities necessary for any flow disruption. Once MOPO is submitted, Contractor to do a walkthrough with operators to confirm activities.

## **PART 2 – PRODUCTS (NOT USED)**

## **PART 3 – EXECUTION (NOT USED)**

## **END OF SECTION**

## **SECTION 01 45 23**

### **TESTING**

#### **PART 1 – GENERAL**

##### **1.01 SUMMARY**

- A. This section specifies testing and inspection. This section is supplementary to the applicable testing and inspection program in WSDOT Standard Specification and describes the responsibilities of all parties pertaining to testing and inspections.

##### **1.02 QUALITY ASSURANCE**

- A. Qualifications:
  - 1. Independent Testing Laboratory (ITL):
    - a. Meet the requirements of ASTM E329.
    - b. Recent inspection by Cement and Concrete Reference Laboratory of National Bureau of Standards and correction of deficiencies noted by the inspection.

##### **1.03 SUBMITTALS**

- A. Procedures: Section 01 33 00, "Contractor Submittals."
- B. Qualifications of testing firm.
- C. Test results.

##### **1.04 DEFINITIONS**

- A. Independent Testing Laboratory: An independent professional testing firm or service hired by the Contractor to perform inspection, testing, and analysis services on materials, mixes, structures, and other items per the Contract Documents.

##### **1.05 INSPECTIONS AND TESTING**

- A. The Project Contracting Agency may throughout the duration of construction, inspect construction and test materials to assure Contractor conformance with these Specifications. This testing shall be in addition to that required of the Contractor in this and other Specification Sections. The Owner will provide Special Inspection (Drawing S1) services.
- B. Provide all labor, equipment, and apparatus necessary for:
  - 1. Testing of the earthwork, backfill materials, compaction, concrete, pipelines, and relocated and repaired utilities.
  - 2. Demonstrating and documenting compliance with the contract requirements, specifications and Drawings and any applicable permits and codes.

3. Provide access for Owner's Special Inspection (Drawing S1) and all tools necessary for sampling by Tribes personnel. No compensation or payment will be made to Contractor for costs incurred as part of sampling by Tribes.
4. Factor Tribes' testing into the project schedule.

#### **1.06 COSTS**

- A. Paid by the Tribes: Testing, as defined in Paragraph 1.05A, will be paid by the Tribes, except retests and re-inspections required due to defective work.
- B. Paid by the Contractor:
  1. Testing, as defined in Paragraph 1.05B of this section, to demonstrate and document conformance with the Contract Documents and applicable permits and codes.
  2. Retesting and re-inspection required because of defective work.
  3. Testing performed for the convenience of the Contractor.

#### **1.07 CONTRACTOR'S RESPONSIBILITIES**

- A. Cooperate with Tribes' testing personnel. Provide access to the work and to Subcontractor's and Supplier's operations.
- B. Provide representative samples of materials to be tested in the required quantities.
- C. Furnish casual labor and facilities:
  1. For access to work to be tested.
  2. To obtain and handle test samples at the site.
  3. To facilitate inspections and tests.
  4. For storage and curing test samples until removed to the laboratory.
  5. To repair any test areas in order to match original conditions.
  6. For all testing and inspection in supplier's facilities.
- D. Testing shall not be cause for claims for delay or extra work.
- E. Coordinate testing as part of the process work sequencing.

#### **PART 2 – PRODUCTS (NOT USED)**

#### **PART 3 – EXECUTION (NOT USED)**

#### **END OF SECTION**



**SECTION 01 45 24**  
**INSTALLATION, TESTING, COMMISSIONING, AND TRAINING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. This section specifies the installation, testing, commissioning, and training for all mechanical, electrical, and instrumentation systems furnished by the Contractor and completed portions of the Work, functioning as completed facilities and a complete project.

**1.02 CONFLICTS WITH MANUFACTURER'S INSTALLATION RECOMMENDATIONS**

- A. All mechanical, electrical, and instrumentation equipment provided under this Contract shall be installed in conformity with the details shown and specified and with the manufacturer's requirements. Should a manufacturer's installation recommendations conflict with specific requirements of this Contract Document, the Contractor shall bring the matter to the attention of the Engineer. Any costs incurred by the Contractor through failure to timely notify the Engineer of a difference between Contract Document and manufacturer's installation requirements shall be borne by the Contractor.

**1.03 SUBMITTALS**

- A. Logbook: A master test logbook shall be maintained by the Contractor, which shall cover all tests, including piping, reservoir, equipment, electrical, and instrumentation. The master test logbook shall be maintained by the Contractor during testing and transmitted to the Owner prior to submitting the final payment application.
- B. Installed Testing Procedures: The Contractor shall be solely responsible for determining, detailing and documenting the individual procedures for the installed testing, operational testing and commissioning requirements specified herein. Prior to receipt of any progress payments in excess of 60 percent of the Contractor's total bid for the Work, the Contractor shall submit to the Owner details of the installed tests and inspections procedures.
1. The procedures shall be divided into two distinct stages: preoperation checkout and startup test. Testing procedures shall be designed to duplicate, as nearly as possible, all conditions of operation and shall be carefully selected to ensure that the equipment is not damaged. Once the testing procedures have been reviewed by the Engineer, the Contractor shall produce checkout, alignment, adjustment, and calibration sign-off forms for each item of equipment to be used in the field by the Contractor and the Engineer jointly to ensure that each item of electrical, mechanical, and instrumentation equipment has been properly installed and tested. The Contractor is advised that failure to observe these precautions may place the acceptability of the subject equipment in question.
  2. Once the testing procedures have been reviewed by the Engineer, the Contractor shall develop and produce sign-off forms for each item of equipment being tested. The content of these forms shall be such to ensure that each piece of equipment, mechanical item, and instrumentation has been properly installed and tested. The

Owner reserves the right to add checks and tests to the prestart-up and start-up schedule submitted by the Contractor, if the Owner feels that the Contractor's schedule is not adequate or complete.

- C. Operational Testing Plan: Contractor shall develop an operational testing plan containing procedures that fulfill the requirements specified herein. The testing plan shall be in sufficient detail such that the Owner is fully aware of all the requirements that need to be provided to the Contractor-operated items during operational testing. Contractor shall be responsible for all coordination with the Owner and Owner's operations staff required for development of this testing plan.
- D. Commissioning Plan: Contractor shall develop a commissioning plan detailing the services and assistance the Contractor will provide in order to fulfill the requirements specified herein. Contractor shall be responsible for all coordination with the Owner and Owner's operations staff required for development of this plan.

#### **1.04 TESTING**

- A. All equipment and partially complete or fully complete portions of the Work included in this Contract shall be tested and inspected to prove compliance with the requirements of these Specifications. Unless otherwise specified, all costs of testing, including temporary facilities and connections, shall be borne by the Contractor.
- B. Installed structural tanks shall be tested for watertightness as specified in Division 3. Installed leakage tests and other piping tests shall be as specified in Division 2 and Division 15. Installed tests for heating, ventilation, and air conditioning systems shall be as specified in Division 15. Installed tests for electrical devices and systems shall be in accordance with Division 16. Installed tests for instrumentation devices and systems shall be in accordance with Division 17. Installed tests for equipment shall be as specified in Division 11.
- C. No tests specified herein shall be applied until the item to be tested has been inspected and approval given for the application of such test.
- D. Tests and inspection shall include:
  - 1. The delivery acceptance test and inspections.
  - 2. The installed tests and inspections.
  - 3. The operational testing of completed portions of the water reclamation facility.
  - 4. The commissioning of completed portions of the facility by Owner's personnel.
- E. Tests and inspections, unless otherwise specified or accepted, shall be in accordance with the recognized standards of the industry. The Contractor shall see that scheduling and performance of all tests are coordinated with involved subcontractors and suppliers.
- F. A master test logbook shall be maintained by the Contractor, per paragraph 1.03. The master test logbook shall be provided with loose-leaf pages, which shall be copied weekly after updating for transmittal to the Engineer.

## **1.05 DELIVERY ACCEPTANCE TESTS AND INSPECTIONS**

- A. The form of evidence of satisfactory fulfillment of delivery acceptance test and inspection requirements shall be, at the discretion of the Engineer, either by tests and inspections carried out in his presence or by certificates or reports of tests and inspections carried out by approved persons or organizations. The Contractor shall provide and use forms, which include all test information including specified operational parameters. The forms used shall be acceptable in content to the Engineer.
- B. The delivery acceptance tests and inspections shall be at the Contractor's expense for any equipment specified in these Contract Documents and shall include the following:
  - 1. Test of items at the place of manufacture during and/or on completion of manufacture, comprising hydraulic pressure tests, electric and instrumentation subsystems tests, performance and operating tests, and inspections in accordance with the relevant Standards of the industry and more particularly as details in individual clauses of these Specifications to satisfy the Engineer that the items tested and inspected comply with the requirements of this Contract.
  - 2. Inspection of all items delivered at the site or to any authorized place of storage in order that the Engineer may be satisfied that such items are of the specified quality and workmanship and are in good order and condition at the time of delivery. The Contractor shall be prepared to remove all coverings, containers, or crates to permit the Engineer to conduct his inspection. Should the Engineer find, in his opinion, indication of damage or deficient quality of workmanship, the Contractor shall provide the necessary documentation, or conduct such tests deemed necessary by the Engineer, to demonstrate compliance.

## **1.06 PREOPERATIONAL INSPECTIONS AND START-UP TESTING**

- A. General: All equipment shall be tested by the Contractor to the satisfaction of the Engineer before any facility is put into operation. Tests shall be as specified herein and shall be made to determine whether the equipment has been properly assembled, aligned, adjusted, and connected. Any changes, adjustments, or replacements required to make the equipment operate as specified shall be carried out by the Contractor as part of the Work.
- B. Preoperation Checkout:
  - 1. The installed tests and inspection procedures shall incorporate all requirements of these Specifications and shall proceed in a logical, step-wise sequence to ensure that all equipment has been properly serviced, aligned, connected, calibrated, and adjusted prior to operation. Preoperation checkout procedures shall include, as applicable, but not necessarily be limited to:
    - a. Piping system pressure testing and cleaning as specified in Division 22.
    - b. Electrical system testing as specified in Division 26.

- c. Instrumentation system testing as specified in Division 40.
- d. Alignment of equipment.
- e. Preoperation lubrication.
- f. Manufacturer's Certificate of Proper Installation (Section 01 99 90, "Reference Forms") duly executed for each piece of installed equipment. A separate Manufacturer's Installation Certification Form shall be completed by the MBR Equipment Supplier for the installation of all equipment supplied by Kubota.

C. Start-Up Test:

1. Once all affected equipment has been subjected to the required preoperational checkout procedures and the Engineer or Owner has witnessed and has not found deficiencies in that portion of the work, individual systems may be started and operated under simulated operating conditions to determine as nearly as possible whether the equipment and systems meet the requirements of these Specifications. The equipment shall be operated a sufficient period of time to determine machine operating characteristics, including temperatures and vibration; to observe performance characteristics and to permit initial adjustment of operating controls. When testing requires the availability of auxiliary instrumentation that has not yet been placed in service, the Contractor shall provide acceptable substitute sources capable of meeting the requirements of the machine, device, or system at no additional cost to the Owner.
2. If under test, any portion of the work should fail to fulfill the contract requirements and is adjusted, altered, renewed or replaced, tests on that portion when so adjusted, altered, removed, or replaced, together with all other portions of the work as are affected thereby, shall, if so required by the Engineer, be repeated within reasonable time and in accordance with the specified conditions. The Contractor shall pay to the Owner all reasonable expenses incurred by the Owner as a result of repeating such tests.
3. Once simulated operation has been completed, all machines shall be rechecked for proper alignment, realigned if necessary, and doweled in place. All equipment shall be checked for loose connections, unusual movement, or other indication of improper operating characteristics. Any deficiencies shall be corrected to the satisfaction of the Engineer or Owner. All machines or devices that exhibit unusual or unacceptable operating characteristics shall be disassembled and inspected. They shall then be repaired or removed from the site and replaced at no cost to the Owner.
4. Test results shall be within the tolerances set forth in the detailed Specification sections of this Contract Document. If no tolerances have been specified, test results shall conform to tolerances established by recognized industry practice.
5. Unless otherwise specified, the Contractor shall provide at no expense to the Owner, all power, fuel, compressed air supplies, labor, and all other necessary items and work required to complete all tests and inspection specified herein. The Contractor shall provide, at no expense to the Owner, temporary heating, ventilating, and air conditioning for any areas requiring it in the case where permanent facilities are not

complete and operable at the time of installed tests and inspections. Temporary facilities shall be maintained until permanent systems are in service.

6. Start-up tests shall be performed with clean water (including reuse water) unless otherwise required by equipment manufacturers. See Section 01 12 16 for testing constraints and MLS pump testing. NOTE: Clean water testing will be done without the MBR cassettes permeating water. MBR cassettes cannot filter clean water for more than a few minutes.
7. Prior to operational testing, the tank shall be filled to 12 inches above the diffusers with clean water to check the diffuser operation and installation. The Contractor is responsible for installing temporary facilities for clean water testing of equipment, including aeration equipment, blowers, permeate pumps, MLR pumps, and instruments. Any transfer pumping, due to failed tests or providing more reuse water for a subsequent test, is the responsibility of the Contractor. Permeating clean water through the MBR membranes will not be part of the clean water test.

## **1.07 OPERATIONAL TESTING**

- A. After completion of all start-up testing and certification by the Engineer that all equipment complies with the requirements of the Specifications, the Contractor shall perform the operational testing with wastewater. All testing is to be coordinated with the Owner. The new MBR tank MLSS concentration shall be 5,000 mg/l or greater before wastewater is treated by new membranes. The Contractor shall be responsible for pumping and coordinating transfer of ML to or between MBRs with Owner. If more than two MCR tanks are to be full of MLSS, Contractor shall allow 1 week to fill the third MBR tank so as not to upset the treatment process.
- B. Unless otherwise noted, a time period of 7 days shall be allowed for each operational test and each MBR tank test. Each portion of the plant being operationally tested must perform through its complete design range for a period of seven consecutive 24-hour days. Failure at any point in a 7-day operational test, as determined by the Engineer or Owner, shall require a restart of the 7-day test period.
- C. Satisfactory completion of operational testing will be required by the Owner as a condition of determining when substantial completion has been achieved.
- D. All costs for temporary power and chemicals required during this operational test shall be borne by the Owner. Sludge hauling, if required, will be performed by the Owner.
- E. All manufacturers' O&M manuals shall have been submitted for review, and approved, prior to beginning operational testing.

## **1.08 COMMISSIONING**

- A. After completion of all operational testing specified herein, and certification by the Engineer that the systems did meet all performance requirements, commissioning will begin. The commissioning period shall be 30 consecutive days. The Contractor shall remove all temporary piping that may have been used during the operational testing and shall assist the Owner in placing the facilities in fully operational mode. The Owner's operations and maintenance personnel will be responsible for the operation of the facilities. The facilities shall be fully operational, accepting, pumping, and treating all flow called for in design and performing all functions as designed. After all these steps are completed, operational testing is successful, all control systems and alarms are operating per design, and the Owner is operating the facility for its designed use, this portion of the facility shall be considered Substantially Complete, but the Contractor shall be available to assist during the rest of the Commissioning period.
- B. The Contractor shall be available at all times during commissioning periods to provide immediate assistance in case of failure of any portion of the system being tested.
- C. During the commissioning period, the Owner shall be responsible for all normal operational costs, and the Contractor shall bear the costs of all necessary repairs or replacements, including labor and materials required to keep the portion of the facilities being commissioned operational.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Installation: Materials employed in the installation shall conform to the requirements of this Contract Document and the recommendations of the equipment manufacturers.
- B. Testing:
  - 1. Gauges, Meters, Recorders, and Monitors:
    - a. Gauges, meters, recorders, and monitors shall be provided by the Contractor as required by the Engineer to supplement or augment the instrumentation system provided under this Contract to properly demonstrate that all equipment fully satisfies the requirements of this Contract Document. All devices employed for the purpose of measuring the performance of the facility's equipment and systems shall specifically be selected to be consistent with the variable being monitored. All instruments shall be recently calibrated and the Contractor shall be prepared at all times to demonstrate, through recalibration, the accuracy of all instruments employed for testing purposes. Calibration procedures shall be in accordance with applicable Standards of ASTM, ISA, and IEEE. The adequacy of all gauges, meters, recorders, and monitors shall be subject to review of the Engineer.
  - 2. Records:
    - a. The Contractor shall provide sign-off forms for all installed and operational testing to be accomplished under this Contract. The sign-off forms shall be produced in

quadruplicate. Sign-off forms shall be provided for each item of mechanical, electrical, and instrumentation equipment provided or installed under this Contract and shall contain provisions for recording relevant performance data for original testing and not less than three retests. Separate sections shall be provided to record values for the preoperation checkout, initials or representatives of the equipment manufacturers, the Contractor, and the Engineer.

- b. The Contractor shall maintain a master file of all equipment sign-off sheets, which shall be available for inspection by the Engineer. Upon completion of testing, the Contractor shall furnish the Engineer with the original of the sign-off sheet for each equipment item.

## **2.02 METHODS**

- A. Installation: All equipment and apparatus used in testing shall be installed by specialists properly skilled in the trades and profession required to assure first-class workmanship. Where required by detailed specifications, the Contractor shall cause the installation of specific equipment testing items to be accomplished under the supervision of factory-trained installation specialists furnished by the equipment manufacturers. The Contractor shall be prepared to document the skills and training of all workmen engaged in the installation of all testing equipment furnished either by the Contractor or the Owner.
- B. Testing:
  - 1. Testing shall proceed on a step-by-step basis in accordance with the Contractor's written testing procedures. The Contractor's testing work shall be accomplished by a skilled team of specialists under the direction of a coordinator whose sole responsibility shall be the orderly, systematic testing of all equipment, systems, structures, and the complete facility as a unit. Each individual step in the procedures shall be witnessed by a representative of the Engineer.
  - 2. During the operational testing period, all equipment and systems in operation shall be operated to the greatest extent practicable and at conditions that represent the full range of operating parameters as defined by this Contract Document.
- C. Testing of all pumps intended to be operated on sewage at different levels of treatment may be accomplished using clean water.

## **2.03 TRAINING**

- A. During the phase of start-up testing of equipment, the Contractor shall make available experienced factory-trained representatives of the manufacturers of all the various pieces of equipment, to train the Owner's personnel in the operation and maintenance thereof. The time required for this training shall be as specified in the Specifications for the specific piece of equipment. The Contractor shall notify the Owner of the time of the training at least 20 days prior to the time of training.

## **PART 3 – EXECUTION (NOT USED)**

### **END OF SECTION**

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## **SECTION 01 45 25**

### **INSTALLATION, TESTING, AND COMMISSIONING FOR MBR EQUIPMENT**

#### **PART 1 – GENERAL**

##### **1.01 GENERAL**

- A. The MBR equipment to be installed at the Tulalip WWTP was pre-selected by the Owner during the design of the Tulalip WWTP. The MBR Equipment Supplier is Kubota Membrane USA Co., 11807 North Creek Parkway South, Bothell, WA 98011. Kubota's project manager is Abdullah Alsoliman (425) 898-2858, ext. 107. For Contract questions, call Jeramy Hadley (425) 898-2858, ext. 103.
- B. The MBR equipment documents and drawings are provided in the appendices of the Contract Documents.
- C. The MBR equipment is to be provided by the Contractor as part of the Work. There will be no contractual relationship between the MBR Equipment Supplier and the Owner. It is the Contractor's responsibility to ensure that a complete and fully functional installation, in accordance with the Contract Documents, is provided. By submitting a bid, the Contractor has represented that he has reviewed the MBR Proposal Documents and preliminary shop drawings for the equipment.
- D. By submitting a bid, the Contractor agrees to accept Kubota's MBR Supply its current form, and purchase the MBR equipment for the price shown on the Bid Form. Costs for all work necessary to install, test, and commission the MBR shall be included in the bid item for the construction of the WWTP.
- E. It is the Contractor's responsibility to coordinate his scope of supply with that of the MBR Equipment Supplier. Where the Contract Documents identify or differentiate between the scope of supply for the MBR Equipment Supplier and the Contractor, such identification is made for the convenience of the Contractor, and is not necessarily complete or accurate. It is the Contractor's responsibility to provide all materials for a fully functional WWTP that conforms to the Contract Documents, whether or not those materials are supplied by the MBR Equipment Supplier, other Suppliers, or directly by the Contractor. The Engineer will not be responsible for clarifying the MBR Equipment Supplier's scope of supply or resolving disputes between the Contractor and the MBR Equipment Supplier.
- F. Contractor shall be responsible for taking delivery (offloading) the MBR Equipment when it is delivered to the site. Contractor is responsible for storage of MBR Equipment after delivery to the site. Per Kubota requirements, all electrical, mechanical, and miscellaneous equipment and parts shall be stored in a dry enclosed heated (minimum 40 degrees Fahrenheit) space.

##### **1.02 SHOP DRAWINGS**

- A. Preliminary shop drawings for the MBR equipment have been submitted by the manufacturer and reviewed by the Engineer and Owner. Portions of the preliminary shop

drawings pertaining to the MBR installation are provided at the back of Appendix C and in Volume 2 of the Contract Specifications.

- B. The shop drawing information provided in the MBR Supply Contract Documents includes the MBR Equipment Supplier's scope of supply, equipment list, warranty information, and Kubota's scope exclusions. Shop drawing information is provided for the membrane modules, diffusers, and control system. Information on valves and instruments to be provided by the MBR Equipment Supplier is not included in the Project Manual but may be available in electronic format to any plan holder who requests it. Available drawings from Kubota, showing their process and instrumentation diagrams, the necessary electrical connections, and the mechanical installation of the equipment, are included with the project Drawings. See Section 46 11 30 for Kubota submittal schedule.
- C. Where the drawings from the MBR Equipment Supplier and the Drawings conflict, the Drawings shall have precedence.
- D. Submit final shop drawings for the MBR equipment for review and approval, as specified in Section 01 33 00, "Contractor Submittals."

## **PART 2 – PRODUCTS**

### **2.01 EQUIPMENT SUPPLIED BY MBR EQUIPMENT SUPPLIER**

- A. The Technical Specifications in the MBR Equipment Supply Contract Documents and the preliminary shop drawings describe the scope of supply of the MBR equipment supplier.
- B. Supply all labor, tools, and materials required to complete the MBR equipment installation.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. Ship, store, and install the MBR equipment in accordance with the manufacturer's recommendations and as shown on the Drawings.
- B. Shipping, storage, and installation instructions for the MBR equipment provided by the MBR Equipment Supplier are included with the shop drawings. These instructions do not necessarily represent complete instructions for this equipment. It is the Contractor's responsibility to determine what additional procedures, if any, are required to provide a fully functional and operational installation.

### **3.02 PAINTING**

- A. Paint equipment as specified in Section 09 91 25 "Equipment and Piping Painting."

### **3.03 MANUFACTURER'S SERVICES**

- A. Services to be provided by the MBR Equipment Supplier during installation, testing, and start-up of the equipment and for the training of the Owner's staff in the operation and maintenance of the equipment, shall be as specified in the MBR Equipment Supply Contract Documents.
- B. A minimum of 20-days' notice shall be provided to the Owner prior to on-site training or facility start-up.
- C. Testing and Commissioning:
  - 1. Testing and commissioning for the MBR equipment shall conform to the procedures described in the MBR shop drawings and the procedures specified in Section 01 45 24, "Installation, Testing, Commissioning, and Training." The price quoted by the MBR Equipment Supplier for the supply of the MBR equipment includes the Supplier's costs for testing, including labor and travel. Contractor's costs for testing and commissioning shall be included in the MBR Treatment Facility construction bid item.
  - 2. The manufacturer and the Contractor shall field test and calibrate the installed equipment to demonstrate that all equipment will satisfactorily perform the functions and criteria specified.
  - 3. Manufacturer's Installation Certification Forms (included in specification Section 01 99 90, "Forms") shall be completed for each piece of equipment provided by the MBR Equipment Supplier and for the MBR installation as a whole.

### **END OF SECTION**

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**SECTION 01 50 00**  
**TEMPORARY CONSTRUCTION FACILITIES**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies the following Contractor's and Project Representative's temporary construction facilities and construction requirements:
  - 1. Utilities: Power, heating, ventilation, telephone, water, and sanitary facilities.
  - 2. Work Site Access Control: Concrete barriers, fencing, and Contractor's security.
  - 3. Miscellaneous Items: cleaning, project signage, and Contractor's office.

**1.02 SUBMITTALS**

- A. Procedures: Section 01 33 00, "Contractor Submittals."
- B. A plan to meet each of the requirements of this section.

**1.03 POWER**

- A. Provide temporary construction power service for Contractor's offices, when offices are provided.
- B. Provide power requirements and coordination with the electrical utility for power takeoff points, voltage and phasing requirements, transformers and metering, as needed.
- C. Provide temporary portable generators and temporary equipment as needed.

**1.04 HEATING**

- A. Provide temporary heating of the buildings and enclosures as necessary to protect work and material against damage by dampness and cold, and to facilitate completion of the work. Supply the fuel, equipment, and materials required for temporary heating.

**1.05 VENTILATION**

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

**1.06 INTERNET (NOT USED)**

**1.07 WATER (NOT USED)**

**1.08 SANITARY FACILITIES**

- A. Provide portable toilet and hand sanitizing facilities for the work force and Project Representative at the site. Comply with applicable laws, ordinances, and regulations pertaining to the public health and sanitation of dwellings and camps.

**1.09 CONCRETE BARRIERS**

- A. Erect and maintain concrete barriers as required for permit and/or easement conditions to limit access to excavations, hazardous areas, and to protect existing facilities from damage during construction and demolition operations.

**1.10 FENCING**

- A. Maintain at all times during the construction period, fences which shall enclose the areas of the site and prevent unauthorized entry to construction areas. Fences shall be chain link and a minimum of 6 feet high. Gates shall be provided at access points where required and these shall be kept locked during off-work hours. A key lock shall be given to the Project Representative.
- B. If fencing is not shown on the Drawings, at a minimum, provide construction limit fencing on the construction limits. Maintain the construction limit fencing vertical at all times.

**1.11 CONTRACTOR'S SECURITY**

- A. Provide security and facilities to protect the work, all temporary and existing facilities from unauthorized entry, vandalism, or theft.

**1.12 CONTRACTOR'S OFFICE OR STORAGE FACILITIES**

- A. It will be the Contractor's responsibility to ensure the copies of the drawings, record drawings, specifications, permits, Accident Prevention Plan, Health and Safety Plan, and any other required documents be available on site.
- B. If the Contractor desires to set up an office or storage facility, the Contractor will be responsible for securing and maintaining the needed site.
- C. At the WWTP, the Contractor is restricted from placing an office or storage facility within the fenced area and paved areas due to the size of the sites and limited accessibility. Contractor to coordinate location of any office or storage facility, placed on the WWTP properties, with the Tribes staff prior to location selection.

**1.13 PROJECT CONTRACTING AGENCY REPRESENTATIVE'S OFFICE (NOT USED)**

**1.14 PROJECT SIGNAGE**

- A. Commercial or advertising signs shall not be allowed on the site.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 50 10**  
**PROTECTION OF EXISTING FACILITIES**

**PART 1 – GENERAL**

**1.01 GENERAL**

- A. The Contractor shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with the Contract Documents.

**1.02 RIGHTS-OF-WAY**

- A. The Contractor shall not do any Work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; any drainage ditch or culvert; or any other structure, nor shall the Contractor enter upon the rights-of-way involved until notified that the Owner has secured authority therefore from the proper party.
- B. After authority has been obtained, the Contractor shall give said party due notice of its intention to begin work, if required by said party, and shall remove, shore, support, or otherwise protect such pipeline, transmission line, ditch, fence, or structure, or replace the same.

**1.03 PROTECTION OF STREET OR ROADWAY MARKERS**

- A. The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced. Survey markers or points disturbed by the Contractor shall be accurately restored after street or roadway resurfacing has been completed.

**1.04 RESTORATION OF PAVEMENT**

- A. General: All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement owner. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.
- B. Temporary Resurfacing: The Contractor shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.
- C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw-cut back and trim the edge so as to provide a clean, sound,

vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

- D. Restoration of Sidewalks or Private Driveways: Wherever sidewalks or private roads have been removed for purposes of construction, the Contractor shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions. If no such period of time is so fixed, the Contractor shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made.

## **1.05 EXISTING UTILITIES AND IMPROVEMENTS**

- A. General: The Contractor shall protect underground utilities and other improvements which may be impaired during construction operations, regardless of whether or not the Utilities are indicated on the Drawings. During the project mobilization it shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.
- B. The Contractor shall verify the exact locations and depths of all buried utilities shown, and the Contractor shall be responsible for exploratory excavations of all utilities that may interfere with the Work or that directly affect pipe fabrication to accommodate pipe alignment and profile. All such exploratory excavations shall be performed as soon as practicable after Notice to Proceed and during mobilization work and, in any event, a sufficient time in advance of pipe fabrication or construction to avoid possible delays to the Contractor's work in the event that the information on the drawings is not accurate. When such exploratory excavations show the utility location as shown on the Drawings to be in error, the Contractor shall so notify the Engineer.
- C. The number of exploratory excavations required shall be that number which is sufficient to accurately determine the alignment and grade of the utility.
- D. Excavations near buried gas or petroleum pipelines shall be conducted in the presence of the utility owner's field representative. Refer to information noted on the drawings.
- E. Utilities to be removed: Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated, the Contractor shall coordinate with the owner of the utility. Should the utility owner allow the Contractor to remove the utility, the Contractor shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Engineer and the owner of the utility. In all cases of such temporary removal or relocation, restoration to the former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement, as

nearly as possible to its former locations and to as good or better condition than found prior to removal.

- F. **Owner's Right of Access:** The right is reserved to the Owner and to the owners of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work of this Contract.
- G. **Underground Utilities Indicated:** Existing utility lines that are indicated or the approximate locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the Contractor, unless otherwise repaired by the owner of the damaged utility. If the owner of the damaged utility performs its own repairs, the Contractor shall reimburse said owner for the costs of repair.
- H. **Underground Utilities Not Indicated:** In the event that the Contractor damages existing utility lines that are not indicated or the locations of which are not made known to the Contractor prior to excavation, a verbal report of such damage shall be made immediately to the Engineer and a written report thereof shall be made promptly thereafter. The Engineer will immediately notify the owner of the damaged utility. If the Engineer is not immediately available, the Contractor shall notify the utility owner of the damage. If directed by the Engineer, repairs shall be made by the Contractor under the provisions for changes and extra work contained in Contract Agreement.
- I. **All costs of locating, repairing damage not due to failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Contract Documents with reasonable accuracy will be paid for as extra work in accordance with the provisions for changes and extra work contained in the Contract Agreement. This shall include cost of equipment on the project which was actually working on that portion of the Work which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such work.**
- J. **Approval of Repairs:** All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement owner before being concealed by backfill or other work.
- K. **Maintaining in Service:** Unless indicated otherwise, oil and gasoline pipelines, power, and telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the Work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The Contractor shall be responsible for and shall repair all damage due to its operations, and the provisions of this section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

## **1.06 LANDSCAPED AREAS**

- A. Landscaped areas damaged during construction shall be repaired to match the pre-construction condition to the satisfaction of the land owner and the Owner.

## **1.07 NOTIFICATION BY THE CONTRACTOR**

- A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way, the Contractor shall notify the respective authorities representing the owners or agencies responsible for such facilities not less than 3 days nor more than 7 days prior to excavation so that a representative of said owners or agencies can be present during such work if they so desire. The Contractor shall also notify the utility Notification center at 1-800-424-5555 at least three (3) working days, but no more than 10 working days, prior to such excavation.

## **PART 2 – PRODUCTS (NOT USED)**

## **PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01 57 19**  
**ENVIRONMENTAL CONTROLS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies environmental mitigation and environmental controls required to be maintained during construction.

**1.02 REFERENCE STANDARDS**

- A. Referenced Standards: This section incorporates by reference the latest revisions of the following documents. They are part of this section as specified and modified. In case of conflict between the requirements of this section and those of a listed document, the requirements of this section shall prevail.

| <b>Reference</b>           | <b>Title</b>                         |
|----------------------------|--------------------------------------|
| ANSI SI.4                  | Specification for Sound Level Meters |
| RCW 70.94                  | Washington Clean Air Act             |
| RCW 70.105                 | Hazardous Waste Management           |
| Chapter 173-60 WAC         | Maximum Environmental Noise Levels   |
| Regulations I, II, and III | Puget Sound Clean Air Agency         |

**1.03 QUALITY ASSURANCE**

- A. Qualifications:
1. Construction Site Environmental Management Supervisor:
    - a. Certified Erosion and Sediment Control Lead (CESCL) as defined by Washington State Department of Ecology.
    - b. Minimum two years of experience responsible for construction site erosion and sediment control.
    - c. More than one person may be submitted to provide services required of the supervisor. One person shall be named responsible for all activities.

**1.04 SUBMITTALS**

- A. Procedures: Section 01 33 00, "Contractor Submittals."
- B. Qualifications.
- C. Citations (if any issued by a governing agency).
- D. Environmental Compliance Manuals.

## **1.05 CONSTRUCTION SITE ENVIRONMENTAL MANAGEMENT SUPERVISOR POSITION DUTIES**

- A. Qualified employee authorized to implement, manage, and enforce compliance with:
  - 1. Erosion and Sediment Control Plan: Conform to Federal Clean Water Act, Section 208 and State Water Pollution Control Act – 90.48V.
  - 2. Ensuring that all necessary pollution control equipment, supplies, and materials are available to implement the Plans.
  - 3. All inspections, monitoring, and compliance.
  - 4. Available 24 hours a day, seven days a week to respond to emergencies and having authority over implementation of environmental controls.

## **PART 2 – PRODUCTS (NOT USED)**

## **PART 3 – EXECUTION**

### **3.01 SITE MAINTENANCE**

- A. Keep the work site, including staging areas and Contractor's facilities, clean, neat, and free from rubbish and debris.
- B. Remove materials and equipment from the work site when no longer necessary.
- C. Unless otherwise indicated, upon completion of the work, clear the work site of equipment, unused materials, and rubbish to present a clean and neat appearance.
- D. Do not allow waste material to remain on the site or on adjacent streets. Collect, carry off the site, and legally dispose of such materials daily.
- E. Potentially contaminated soils (suspect soils) which require determination of makeup, may be stockpiled per the Project Representative requirements.
- F. Be responsible for meeting permit requirements or approvals for use of disposal sites.
- G. Handle paints, solvents, and other construction materials with care to prevent entry of contaminants into storm drains, surface waters, or soils.
- H. Unless otherwise indicated, restore ground surface to its pre-construction condition. Restore disturbed areas as required by Owner requirements, and easement stipulations, as applicable, and in conformance with Mitigation and Restoration plan sheets in the Drawings.
- I. No tracking of mud or dirt onto private or public streets is allowed.

### **3.02 AIR POLLUTION CONTROL**

- A. Do not discharge smoke, dust, and other contaminants into the atmosphere that violate the regulations of legally constituted authorities.
- B. Do not allow internal combustion engines to idle for more than fifteen minutes.
- C. Maintain construction vehicles and equipment in good repair.
- D. When exhaust emissions are determined to be excessive, repair or replace equipment.
- E. Minimize dust nuisance by cleaning, sweeping, or other means.

### **3.03 NOISE CONTROL**

- A. General:
  - 1. Since Contractor's means and methods are not known to the Owner, the following represents a list of potential noise mitigation measures. Use these and other mitigation measures as required:
    - a. Adjust operations with the hours of work.
    - b. Use sound blanketing, noise attenuation enclosures, and barriers.
    - c. Install individual noise barriers or enclosures around equipment.
    - d. Use best available equipment and technology that assist in meeting the noise requirements.

### **3.04 VIBRATION CONTROL**

- A. Coordinate and mitigate construction activities within the work corridor to avoid impacts to adjacent buildings caused by construction-related vibrations.

### **3.05 SUSPECT MATERIALS**

- A. If suspect materials are encountered, control and contain the material until appropriate measures can be taken.
- B. Stockpile material at location determined by the Project Representative.
- C. Contaminated material is defined in RCW 70.105.010.

### **3.06 NON-COMPLIANCE WITH REGULATIONS**

- A. Be responsible for all fines incurred from non-compliance with regulations of governing authorities.
- B. Be responsible for all damages and costs resulting from non-compliance with regulation or governing authorities.
- C. Submit all citations within 7 days of receipt.

### **3.07 ODOR CONTROL**

- A. Place covers over live sewer lines, wet wells, and manholes exposed to atmosphere during time periods of no construction work to eliminate potential of odor entering the atmosphere.

**END OF SECTION**



**SECTION 01 60 00**  
**PRODUCT REQUIREMENTS**

**PART 1 – GENERAL**

**1.01 DEFINITIONS**

A. Products:

1. New items for incorporation in the Work, whether purchased by Contractor or Owner for the Project, or taken from previously purchased stock, and may also include existing materials or components required for reuse.
2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent, and is not intended to change the meaning of such other terms used in the Contract Documents as those terms are self-explanatory and have well recognized meanings in the construction industry.
3. Items identified by manufacturer's product name, including make or model designation indicated in the manufacturer's published product literature that is current as of the date of the Contract Documents.

**1.02 DESIGN REQUIREMENTS**

A. Furnish and install structures, systems, equipment, and components, including supports and anchorages, in accordance with the provisions of the State-adopted and local amendments to the International Building Code (2012 IBC).

1. Wind: 115 mph Basic Wind Speed, with Exposure Category B.
2. Seismic: See Section 13 05 41, "Seismic Restraint Requirements for Nonstructural Components."

**1.03 SUBMITTALS**

A. Administrative Submittals: Schedule of factory tests required by Contract Documents. Identify tests for which Engineer's presence has been specified.

B. Quality Control Submittals:

1. Factory Tests: As specified in the individual sections of this document.
  - a. Procedures: Preliminary outlines.
  - b. Final accepted procedures prior to start of factory testing.
  - c. Test Documentation: Results of successful testing, including certification of procedures and results.

#### **1.04 ENVIRONMENTAL REQUIREMENTS**

- A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at 60 feet above sea level.
- B. Provide equipment and devices installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of 0 to 100 degrees F.

#### **1.05 PREPARATION FOR SHIPMENT**

- A. When practical, factory assemble products. Match, mark, or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with a strippable protective coating.
- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, and contents by name, name of Project and Contractor, equipment number, and approximate weight. Include complete packing lists and bills of materials with each shipment.
- C. Spare Parts, Special Tools, Test Equipment, Expendables, and Maintenance Materials:
  - 1. Furnish as required by the Specifications prior to:
    - a. Starting operational testing as set forth in Section 01 45 24, "Installation, Testing, Commissioning, and Training" or
    - b. Operation of the equipment by the Owner, or
    - c. 75 percent project completion, whichever occurs first.
  - 2. Properly package to avoid damage in original cartons insofar as possible. Replace parts damaged or otherwise inoperable.
  - 3. Firmly fix to and prominently display on each package.
    - a. Minimum 3-inch by 6-inch manila shipping tag with the following information printed clearly:
      - 1) Manufacturer's part description and number.
      - 2) Applicable equipment description.
      - 3) Quantity of parts in package.
      - 4) Equipment manufacturer.
      - 5) Applicable Specification Section.
      - 6) Name of Contractor.
      - 7) Project name.

- 4. Deliver materials to site.
- 5. Notify Engineer and Owner upon arrival.
- D. Protect equipment from exposure to the elements and keep thoroughly dry and dust free at all times. Protect painted surfaces against impact, abrasion, discoloration, or other damage. Grease or oil all bearings and similar items.
- E. Request a minimum 7-day advance notice of shipment from manufacturers.
- F. Factory Test Results: Shall be reviewed and accepted by Engineer before product shipment as required in individual Specification Sections.

#### **1.06 DELIVERY AND INSPECTION**

- A. Deliver products in accordance with the accepted current progress schedule and coordinate to avoid conflict with work and conditions at the site. Deliver anchor bolts and templates sufficiently early to permit setting prior to placement of structural concrete.
- B. Deliver products in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label the date of manufacture and shelf life, where applicable. Include UL labels on products so specified.
- C. Unload products in accordance with manufacturer's instructions for unloading, or as specified. Record the receipt of products at the site. Inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from the site and expedite delivery of identical new undamaged products and remedy incomplete or lost products to provide that specified, so as not to delay the progress of the Work.

#### **1.07 HANDLING, STORAGE, AND PROTECTION**

- A. Handle products in accordance with the manufacturer's written instructions, and in a manner to prevent damage. Store products, upon delivery, in accordance with manufacturer's instructions, with labels intact and legible, in approved storage yards or sheds. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.
- B. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered, but not installed in the Work.
- C. Store electrical, instrumentation, control products, and equipment with bearings in weathertight structures maintained above 60 degrees F and below 100 degrees F. Protect electrical, instrumentation, control products, and insulation against moisture, water, and dust damage. Connect and operate continuously all space heaters furnished in electrical equipment.

- D. Store fabricated products aboveground, on blocking or skids, and prevent soiling or staining. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings and provide adequate ventilation to avoid condensation.
- E. Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.
- F. Hazardous Materials: Prevent contamination of personnel, the storage building, and the site. Meet the requirements of the product specifications, codes, and manufacturer's instructions.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL**

- A. Provide manufacturer's standard materials suitable for service conditions unless otherwise specified in the individual Specifications.
- B. Where product specifications include a named manufacturer, with or without model number, and also include performance requirements, named manufacturer's products must meet the performance specifications.
- C. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement, and manufacturer's services, and implement same or similar process instrumentation and control functions in same or similar manner.
- D. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- E. Provide interchangeable components of the same manufacture and for similar components, unless otherwise specified.
- F. Equipment, Components, Systems, and Subsystems: Design and manufacture with due regard for health and safety of operation, maintenance, accessibility, durability of parts, and shall comply with applicable OSHA, state, and local health and safety regulations.
- G. Regulatory Requirement: Coating materials shall meet federal, state, and local requirements limiting the emission of volatile organic compounds and for worker exposure.
- H. Safety Guards: Provide for all belt or chain drives, fan blades, couplings, or other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16 gauge or heavier galvanized steel, aluminum-coated steel, or galvanized or aluminum-coated 1/2-inch mesh expanded steel. Provide galvanized steel accessories and supports, including bolts. For outdoor application, prevent entrance of rain and dripping water.

- I. Provide materials and equipment listed by UL wherever Standards have been established by that agency.
- J. Equipment Finish:
  - 1. Provide manufacturer's standard finish and color, except where specific color is indicated.
  - 2. If manufacturer has no standard color, provide equipment with ANSI No. 61, light gray color.
- K. Special Tools and Accessories: Furnish to Owner, upon acceptance of equipment, all accessories required to place each item of equipment in full operation. These accessory items include, but are not limited to, adequate oil and grease (as required for first lubrication of equipment after field testing), light bulbs, fuses, hydrant wrenches, valve keys, handwheels, chain operators, special tools, and other spare parts as required for maintenance.
- L. Lubricant: Provide initial lubricant recommended by equipment manufacturer in sufficient quantity to fill lubricant reservoirs and to replace consumption during testing, start-up, and operation until final acceptance by Owner.

## **2.02 FABRICATION AND MANUFACTURE**

### **A. General:**

- 1. Manufacture parts to U.S.A. standard sizes and gauges.
- 2. Two or more items of the same type shall be identical, by the same manufacturer, and interchangeable.
- 3. Design structural members for anticipated shock and vibratory loads.
- 4. Use 1/4-inch-minimum thickness for steel that will be submerged, wholly or partially, during normal operation.
- 5. Modify standard products as necessary to meet performance Specifications.

### **B. Lubrication System:**

- 1. Require no more than weekly attention during continuous operation.
- 2. Convenient and Accessible: Oil drains with bronze or stainless steel valves and fill plugs easily accessible from the normal operating area or platform. Locate drains to allow convenient collection of oil during oil changes without removing equipment from its installed position.
- 3. Provide constant-level oilers or oil level indicators for oil lubrication systems.
- 4. For grease type bearings, which are not easily accessible, provide and install stainless steel tubing; protect and extend tubing to convenient location with suitable grease fitting.

## **2.03 SOURCE QUALITY CONTROL**

- A. Where Specifications call for factory testing to be witnessed by Engineer, notify Engineer not less than 14 days prior to scheduled test date, unless otherwise specified.
- B. Calibration Instruments: Bear the seal of a reputable laboratory certifying that instrument has been calibrated within the previous 12 months to a standard endorsed by the National Institute of Standards and Technology (NIST).
- C. Factory Tests: Perform in accordance with accepted test procedures and document successful completion.

## **PART 3 – EXECUTION**

### **3.01 INSPECTION**

- A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install materials or equipment showing such effects. Remove damaged material or equipment from the site and expedite delivery of identical new material or equipment. Delays to the Work resulting from materials or equipment damage, which necessitates procurements of new products, will be considered delays within Contractor's control.

### **3.02 INSTALLATION**

- A. Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. No shimming between machined surfaces is allowed.
- C. Install work in accordance with NECA Standard of Installation, unless otherwise specified.
- D. Repaint painted surfaces that are damaged prior to equipment acceptance.
- E. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions and as may be specified. Retain a copy of manufacturer's instructions on site, available for review at all times.
- F. For material and equipment specifically indicated or specified to be reused in the Work:
  - 1. Use special care in removal, handling, storage, and reinstallation to assure proper function in the completed Work.
  - 2. Arrange for transportation, storage, and handling of products that require off-site storage, restoration, or renovation. Include costs for such work in the Contract Price.

### **3.03 FIELD TESTING**

- A. In accordance with Section 01 45 24, "Installation, Testing, Commissioning, and Training."

### **3.04 ADJUSTMENT AND CLEANING**

- A. Perform required adjustments, tests, operation checks, and other start-up activities.

### **3.05 LUBRICANTS**

- A. Fill lubricant reservoirs and replace consumption during testing, start-up, and operation prior to acceptance of equipment by Owner.

**END OF SECTION**

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## **SECTION 01 70 40**

### **GUARANTEES**

#### **PART 1 – GENERAL**

##### **1.01 SUMMARY**

- A. This section defines Contractor responsibilities and procedures to guarantee the equipment and facilities installed under this Contract. Requirements of this specification do not release the Contractor from fulfilling those requirements as stated in Supplementary Conditions of this Contract. Specific guarantees above and beyond the basic 1-year guarantee are indicated in the technical specification sections.

##### **1.02 DETERMINATION OF GUARANTEE DATES**

- A. Guarantee Dates: Guarantee dates for those portions of the work made available to the Owner for possession and use under the terms and conditions of Supplementary Conditions of this Contract shall be established at the time of availability, provided that:
  - 1. The procedures for equipment and system performance and operational testing have been fulfilled for that portion of the work as required in Section 01 45 24, "Installation, Testing, Commissioning, and Training" of this Contract.
  - 2. Final O&M manuals have been received by the Owner or Engineer for that portion of the work as required in Section 01 78 23, "Operation and Maintenance Data" of this Contract.
- B. Acceptance of the Work: Unless previous portions of the work have been accepted as indicated in the Supplementary Conditions, the guarantee dates shall be established as indicated in Supplementary Conditions upon acceptance of the work.

##### **1.03 GUARANTEE**

- A. For a period of 365 consecutive calendar days, commencing on the guarantee start date (but commencing only as to such portions of the work so possessed or used), the Contractor shall, upon the receipt of notice in writing from the Owner or Engineer, promptly correct any defective work. If the defective work cannot be corrected, or if the corrected work has been rejected by the Owner or Engineer, the Contractor shall promptly remove it from the site and replace it with non-defective work, all at no cost to the Owner. The Owner is hereby authorized to make such corrections if, ten days after giving of such notice to the Contractor, the Contractor has failed to make or undertake the corrections or removal/replacement with due diligence. In case of an emergency where, in the opinion of the Owner, delay could cause serious loss or damage, corrections, or replacement may be made prior to or concurrent with notice being sent to the Contractor. All expenses in connection with such corrections or replacement, including costs for professional services, will be charged to the Contractor. This guarantee shall be extended for a period equal to the time of correction or replacement.
- B. For the purpose of this paragraph, acceptance of the work shall not extinguish any covenant or agreement on the part of the Contractor to be performed or fulfilled under this

Contract which has not, in fact, been performed or fulfilled at the time of such acceptance. All covenants and agreements shall continue to be binding on the Contractor until they have been fulfilled.

- C. The guarantee provided in this section shall be in addition to those specific guarantee or warranty requirements for particular equipment and/or work items indicated in the Specifications, and in addition to any other rights or remedies available to the Owner under this Contract or at law.

## **PART 2 – PRODUCTS (NOT USED)**

## **PART 3 – EXECUTION**

### **3.01 DOCUMENTATION**

- A. Guarantee dates and the durations or the guarantee period shall be recorded and submitted to the Owner or Engineer on the Guarantee Documentation Form as provided in Section 01 99 90, "Reference Forms."
- B. The guarantee information shall be documented by specification section, in the same order as presented in the O&M manuals.
- C. Vendor information including point-of-contact, company name, company address, and company emergency telephone number shall be included for applicable equipment and components of the facility.

### **3.02 GUARANTEE RESPONSE**

- A. The Owner or Engineer or appointed representative shall be the point-of-contact for response to guarantee-related problems during the one-year guarantee period. The Owner or Engineer shall evaluate the problem and initiate the guarantee response by the appropriate vendor or contractor.
- B. For special guarantees extending beyond the one-year guarantee period, Owner personnel shall contact the appropriate vendor directly as identified on the Guarantee Documentation Form.
- C. Upon notification of need for guarantee response, the Contractor shall provide written notification to the Owner initiator, indicating scheduled time of response so that Owner maintenance personnel may be scheduled to be on hand to provide assistance and witness the repair. Guarantee work may only be undertaken on Mondays through Fridays, from 8:00 a.m. to 5:00 p.m., unless the Owner gives express written consent for the performance of the work at other times.
- D. Items requiring guarantee response within the one-year guarantee period shall have a completely new guarantee period established from the time of repair. The Contractor shall provide written verification of the newly established guarantee period to the Owner or Engineer upon completion of the repair.

## **END OF SECTION**

**SECTION 01 74 23**  
**TANK CLEANING AND FINAL CLEANING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies the tank cleaning and final project cleaning on the work performed or areas affected by work. See Sections 01 12 00, 01 12 16 and 01 45 24 regarding tank cleaning and pressure washing requirements and schedule. Anoxic Tank 2, and all 4 MBR tanks will require pressure washing, debris removal, cleaning and vacuuming before they can be placed in operation.

**1.02 PURPOSE**

- A. The purpose of the tank cleaning is to remove material from the tanks. Any debris, grit, filings or other materials can damage the MBR membranes. The MBR tanks also need to be cleaned prior to clean water testing.
- B. The purpose of other cleaning is to clean up from the construction which occurred during the work of this Contract.
- C. The site shall be maintained at the highest level of readiness and cleanliness. Take due care that materials purchased under this contract remain undamaged and free of dust and dirt at all times.

**1.03 CLEANING REQUIREMENTS**

- A. Perform a wipe down of equipment, pipe, etc. with a wet towel and cleaning solvent as appropriate for the item being cleaned.
- B. Clean all items affected by the work and ensure they are free of litter, trash, dust, dirt, stains, damage, or defects.
- C. Wash, sweep, polish, or otherwise clean all new and existing finished wall surfaces, floors, windows, hardware, mirrors, lighting fixtures, and items of equipment.
- D. Replace damaged, defaced, or marred items.

**1.04 TANK CLEANING REQUIREMENTS**

- A. Anoxic 2 and all 4 MBR tanks need to be completely free of dirt, bioslime and debris prior to filling.
- B. All 5 tanks listed shall be high-pressure washed, wash debris removal, cleaning, and vacuum cleaned before clean water testing and membranes are placed or transferred to them. Kubota representative or Owner shall make tank inspections after cleaning is complete and before membranes can be placed.

## **PART 2 – PRODUCTS**

### **2.01 CLEANING MATERIALS**

- A. Use cleaning materials and processes recommended by the manufacturers of the surfaces to be cleaned.
- B. Use non-toxic cleaning agents when possible.

## **PART 3 – EXECUTION**

### **3.01 TIMING**

- A. As noted, the MBR tanks need to be cleaned prior to clean water testing and all tanks shall be cleaned before placed into operation. Upon approval of schedule by the Project Contracting Agency, clean rooms' materials, and equipment within the Headworks and MBR Building, including, but not limited to, all fixtures, equipment, flooring, piping, conduit, handrailing, and tanks.

### **3.02 CLEANING**

- A. Use experienced workers or professional cleaners.
- B. Remove dirt, stains, labels, and foreign materials.
- C. Repair and touch-up marred areas.
- D. Broom clean paved surfaces; rake clean other surfaces of grounds; vacuum, polish, and mop floors.
- E. Remove snow and ice from access to buildings.
- F. Replace air conditioning and ventilation unit filters if units were operated during construction.
- G. Clean ducts, blowers, and coils if air conditioning units were operated without filters during construction.
- H. Clean inside of electrical panels, abiding by the requirements of the manufacturer.
- I. Provide painting and coating touch up for any scratches on equipment.

## **END OF SECTION**

**SECTION 01 77 00**  
**PROJECT CLOSEOUT**

**PART 1 – GENERAL**

**1.01 FINAL CLEANUP**

- A. The Contractor shall promptly remove from the vicinity of the completed Work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the Owner will be withheld until the Contractor has satisfactorily performed the final cleanup of the Site.

**1.02 CLOSEOUT TIMETABLE**

- A. The Contractor shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the Contract). Such dates shall be established not less than one week prior to beginning any of the foregoing items, to allow the Owner, the Engineer, and their authorized representatives sufficient time to schedule attendance at such activities.

**1.03 FINAL SUBMITTALS**

- A. The Contractor, prior to requesting final payment, shall obtain and submit the following items to the Engineer for transmittal to the Owner:
1. Written guarantees, where required.
  2. Technical Manuals and instructions.
  3. Maintenance stock items; spare parts; special tools.
  4. Completed record drawings.
  5. Certificates of inspection and acceptance by local governing agencies having jurisdiction.
  6. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.
  7. Any information needed by the Engineer for completing the Washington State Department of Health Construction Report such as pressure, leakage, and bacteriological test reports.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

## **SECTION 01 78 00**

### **SAFETY**

#### **PART 1 – GENERAL**

##### **1.01 GENERAL**

- A. All parties agree that they are responsible for compliance with all tribal, local, and federal laws, regulations, and standards that pertain to safety, as those laws, regulations, and standards apply to their employees. All parties recognize that the responsibility for employee safety rests with each employer respectively. Each contractor (prime or sub) shall be responsible for the safety of its own employees. The Contracting Agency accepts no responsibility for, nor will it provide any safety consultation, monitoring, or enforcement to any contractor on the site concerning the safety of contractor's employees. Any safety equipment needed on the job, including but not limited to PPE, shall be furnished by each contractor for its employees.
- B. The Owner will regard safety on this project to be of the utmost importance. Under no conditions shall safety requirements be waived for the sake of cost, schedule, or convenience. SAFETY MAY BE USED AS CRITERIA FOR APPROVAL OF PAY APPLICATIONS. Unsafe conditions, lack of proper and or untimely documentation and submittals, and lack of adherence to safety rules and requirements will not be tolerated.
- C. Each contractor, AS A MINIMUM, shall follow all tribal, local, and federal laws regarding worker safety. This shall include all requirements of OSHA and referenced standards therein included.
- D. The Owner, through the Contracting Agency, may at various times, request voluntary OSHA inspections. Each contractor shall immediately correct and respond to any violations in writing to the Owner, through the Contracting Agency, and to the appropriate agency.
- E. Indiscriminate accumulations of debris, waste, or scrap in work areas will not be permitted. (Areas must be designated for storage or disposal.) All materials, tools, and equipment must be stored in an orderly manner in designated areas.

##### **1.02 SAFETY PROGRAM**

- A. Contractor shall submit, within ten (10) days of Notice to Proceed, a copy of its company safety program including jobsite specific safety plans. This program shall incorporate all lower-tier subcontractor safety information or separate policies shall be submitted for all lower-tier subcontractors used on the project. This safety policy shall conform to all OSHA requirements and shall include as follows:
  - 1. A Hazard Communications Program, including site specific Safety Data Sheets (SDSs) for all chemicals used by Contractor and its subcontractors.
  - 2. Provisions for continual training of all on-site employees. This shall be done by holding weekly safety toolbox talks, documented by signed attendance sheets with safety topic submitted to the Contracting Agency at each weekly project meeting.

3. Weekly jobsite safety inspections shall be completed by each Contractor.
4. Designation and continual training of competent persons for the project.
5. Contractor shall provide services of a competent safety person (as defined by OSHA) for the project to inspect the project for safety hazards related to their Work. The safety person should not be one of the superintendents dedicated to this Project; however, the safety person shall be on-site whenever Work is being performed by Contractor. The safety person shall attend the Project coordination meetings.
6. Contractor, with assistance from all contractors' safety persons, shall perform a monthly total Project safety audit conducted by a company safety officer or independent consultant of the Contractor. Results of the safety audit shall be submitted to the Contracting Agency and distributed to all contractors the same day the audit is conducted by Contractor. If a contractor does not immediately address any observed or noted safety concern, Contractor's company safety officer or independent consultant shall contact the Owner, through the Contracting Agency. Contractor's company safety officer or independent consultant, with assistance from Contractor's competent safety person, shall record all accidents for the Project and report their findings to the Owner, through the Contracting Agency.
7. Provisions for enforcement of the safety policies by Site Foreman, Superintendent and or Project Manager.
8. Documentation that each on-site employee has been trained in general safety and has been informed of the location of the Safety Program, Haz-Com Program and Emergency procedures on this project.

### **1.03 SUBMITTALS**

- A. Company safety programs, as described above, shall be submitted to the Owner, through the Contracting Agency, within ten (10) days of Notice to Proceed or Letter of Intent to Award. Additions to the program, such as documentation of training as new employees arrive at the site, shall be forwarded to the Contracting Agency. All contractor Safety Programs, and Haz-Com Programs, with SDS Sheets, will be kept in one central location within the Contractor's office throughout the duration of the project.
- B. Contractor is required to conduct and all employees are required to attend a "Tool Box" type safety meeting once a week. These meetings may either be presided over by Contractor's foreman or another competent representative designated by Contractor. The Contracting Agency's personnel are available to participate in these safety meetings.
- C. Contractor will be responsible to submit WEEKLY tool box safety meeting minutes to the Contracting Agency while Contractor has employees on-site.
- D. All weekly inspections will be documented by Contractor and submitted to the Owner, through the Contracting Agency. Contractor shall immediately correct all deficiencies and submit a list of corrective actions within one (1) working day or sooner if required, of safety inspection.
- E. Subject specific daily and or weekly inspections by Contractor, including temporary electric, crane, or other work activities as required, shall be timely submitted to the Owner, through the Contracting Agency.



#### **1.04 TRAINING**

- A. Contractor shall ensure that employee designated as Project Competent Person has been fully trained for this task and has the full authority to take corrective action when required.
- B. Contractor shall provide continual training to Project Competent Person, Superintendent, and Foreman as required by tribal or OSHA standards.
- C. The Contracting Agency will recommend General Safety Topics to enable Contractor's supervising personnel to train employees if a Contractor requests such assistance.

#### **PART 2 – PRODUCTS (NOT USED)**

#### **PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 78 23**  
**OPERATION AND MAINTENANCE DATA**

**PART 1 – GENERAL**

**1.01 QUALITY ASSURANCE**

- A. Operation and Maintenance Manuals for equipment and systems shall be prepared by the equipment manufacturer or system supplier.

**1.02 SEQUENCE**

- A. Preliminary Manuals: Submit prior to shipment date for equipment, system, subsystem, or component. Preliminary manuals for all major equipment shall be submitted prior to 50 percent completion of the Contract schedule. Include copy of warranties, bonds, and service agreements. Hard copy manuals and searchable PDF electronic copy manuals shall be provided.
- B. Final Manuals: Submit and achieve approval prior to Final Acceptance.

**1.03 GENERAL**

- A. Furnish for each item of equipment or system as specified in the individual Specification Sections.
- B. Hard Copy Manual Format:
  - 1. Size: 8-1/2 inches by 11 inches.
  - 2. Paper: 20-pound minimum, white for typed pages.
  - 3. Text: Manufacturer's printed data, or neatly typewritten.
  - 4. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
  - 5. Provide fly-leaf for each separate product, or each piece of operating equipment, with typed description of product and major component parts of equipment and provide with heavy section dividers with numbered plastic index tabs.
  - 6. Provide each manual with title page, and typed table of contents with consecutive page numbers. Place contents of entire set, identified by volume number, in each binder.
  - 7. Cover: Identify each volume with typed or printed title "OPERATION AND MAINTENANCE MANUAL, VOLUME NO. \_\_\_\_ OF \_\_\_\_," if applicable, and list:
    - a. Project title.
    - b. Designate the system or equipment for which it is intended.

- c. Identity of separate structure as applicable.
  - d. Identity of general subject matter covered in manual. Identity of Equipment Number and Specification Section.
- 8. Assemble and bind material in same order as specified as much as possible.
- 9. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs or detailed graphics.
- 10. Binders:
  - a. Preliminary Manuals: Heavy paper covers.
  - b. Final Manuals: Commercial quality, substantial, permanent, three-ring slant "D" style binders with durable, cleanable, plastic covers.
- 11. Table of contents neatly typewritten, arranged in a systematic order:
  - a. Contractor, name of responsible principal, address, and telephone number.
  - b. List of each product required to be included, indexed to content of each volume.
  - c. List with Each Product: Name, address, and telephone number of subcontractor, supplier, installer, and maintenance contractor, as appropriate:
    - 1) Identify area of responsibility of each.
    - 2) Provide local source of supply for parts and replacement.
  - d. Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
- 12. Product Data:
  - a. Include only those sheets that are pertinent to specific product.
  - b. Clearly annotate each sheet to:
    - 1) Identify specific product or part installed.
    - 2) Identify data applicable to installation.
    - 3) Delete references to inapplicable information.
- 13. Drawings:
  - a. Supplement product data with drawings as necessary to clearly illustrate:
    - 1) Relations of component parts of equipment and systems.
    - 2) Control and flow diagrams.

- 3) Coordinate drawings with project record documents to assure correct illustration of completed installation.
- 4) Do not use project record documents as maintenance manual drawings.
- 5) Provide reinforced three-hole punched binder envelope, bind in with text.
- 6) Reduced to 8-1/2 inches by 11 inches, or 11 inches by 17 inches folded to 8-1/2 inches by 11 inches.
- 7) Where reduction is impractical, fold and place in 8-1/2-inch by 11-inch envelopes bound in text.
- 8) Identify Specification Section and product on drawings and envelopes.

14. Instructions and Procedures: Within text as required to supplement product data.

- a. Handling, storage, maintenance during storage, assembly, erection, installation, adjusting, testing, operating, shutdown in emergency, troubleshooting, maintenance, interface, and as may otherwise be required.
- b. Organize in a consistent format under separate heading for each different procedure.
- c. Provide a logical sequence of instructions for each procedure.
- d. Provide information sheet for Owner's personnel, including:
  - 1) Proper procedures in the event of failure.
  - 2) Instances that might affect the validity of warranties or bonds.

15. Warranties, Bonds, and Service Agreements.

#### **1.04 SUBMITTALS**

A. Preliminary Manuals:

1. Submit one searchable PDF electronic copy and two hard copies for Owner's and Engineer's review.
2. Disposition and Distribution: In accordance with Section 01 33 00, "Contractor Submittals."
3. Engineer's review will be based on the Operations and Maintenance Review Checklist form in Section 01 99 90, "Reference Forms."

B. Final Manuals: Submit four hard copies of the final manual.

C. PDF Copy Manual Format:

1. The PDF copy manual shall be the same material included in the hard copy.
2. The Contractor shall provide two electronic copies of each final O&M manual in Adobe Acrobat's Portable Document Format (PDF) format. The electronic copy shall be submitted on a CD or DVD.
3. PDF files should be created by electronic conversion from original electronic document format whenever possible. If scanning is required, scans shall be 300 dpi, minimum. The documents shall be clear and easily viewed at 600 percent magnification.
4. At a minimum, a separate PDF file shall be created for each Specification Section for which equipment is being supplied. For sections or equipment that include multiple subassemblies or components, additional PDF files can be used if needed or if more convenient.
5. Each PDF file shall be fully bookmarked and searchable. A maximum of 80 pages shall be included between bookmarks. Bookmarks should, in general, recreate the "tab" system required for paper O&M manuals.
6. Drawings: Direct electronic conversion to PDF format is preferred. If they are scans of prints, they shall be scanned at a minimum 300 dpi, black and white, grayscale, or color, whichever gives the clearer drawing.

**1.05 MANUALS FOR EQUIPMENT AND SYSTEMS**

A. Content for Each Unit (or Common Units) and System:

1. Description of unit and component parts including controls, accessories, and appurtenances:
  - a. Function, normal operating characteristics, and limiting conditions.
  - b. Performance curves, engineering data, nameplate data, and tests.
  - c. Complete nomenclature and commercial number of replaceable parts.
2. Operating Procedures:
  - a. Start-up, break-in, routine, and normal operating instructions.
  - b. Test procedures and results of factory tests where required.
  - c. Regulation, control, stopping, and emergency instructions.
  - d. Description of operation sequence by control manufacturer.
  - e. Shutdown instructions for both short and extended durations.
  - f. Summer and winter operating instructions, as applicable.

- g. Safety precautions.
    - h. Special operating instructions.
    - i. Installation instructions.
  - 3. Maintenance and Overhaul Procedures:
    - a. Routine operations.
    - b. Guide to troubleshooting.
    - c. Disassembly, removal, repair, reinstallation, and reassembly.
  - 4. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
  - 5. Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.
  - 6. "Maintenance Summary Form" in Section 01 99 90, "Reference Forms."
  - 7. Spare parts ordering instructions and list of recommended spare parts.
  - 8. Where applicable, identify installed spares and other provisions for future work (e.g., reserved panel space, unused components, wiring, terminals).
  - 9. Manufacturer's printed operating and maintenance instructions.
  - 10. As-installed, color-coded piping diagrams.
  - 11. Charts of valve tag numbers, with location and function of each valve.
- B. Content for Each Electric or Electronic Item or System:
- 1. Description of Unit and Component Parts:
    - a. Function, normal operating characteristics, and limiting conditions.
    - b. Performance curves, engineering data, nameplate data, and tests.
    - c. Complete nomenclature and commercial number of replaceable parts.
    - d. Interconnection wiring diagrams, including all control and lighting systems.
  - 2. Circuit Directories of Panelboards:
    - a. Electrical service.
    - b. Controls.
    - c. Communications.

3. List of electrical relay settings, and control and alarm contact settings.
  4. Electrical interconnection wiring diagram, including control and lighting systems.
  5. As-installed control diagrams by control manufacturer.
  6. Operating Procedures:
    - a. Routine and normal operating instructions.
    - b. Sequences required.
    - c. Safety precautions.
    - d. Special operating instructions.
  7. Maintenance Procedures.
    - a. Routine operations.
    - b. Guide to troubleshooting.
    - c. Adjustment and checking.
    - d. List of relay settings, control, and alarm contact settings.
  8. Manufacturer's printed operating and maintenance instructions.
  9. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- C. Detailed Master List:
1. Provide a detailed spreadsheet of all equipment specified in Divisions 22 through 40.
  2. Subdivide this spreadsheet into the following categories and include the information below in each category:
    - a. Specifications:
      - 1) Corresponding specification number for each piece of equipment.
      - 2) List the corresponding article numbers in each specification that refer to:
        - a) O&M manuals.
        - b) Special warranty.
        - c) Training required (include the number of training hours specified).
        - d) Spare parts.
        - e) Testing.



b. Equipment Information:

- 1) Equipment number.
- 2) Drawing References: Include the drawing number(s) where each piece of equipment is referenced in the Mechanical, Electrical, and P&ID Drawings.
- 3) A brief description of each piece of equipment (where applicable).

c. Subcontractor/Manufacturer Information:

- 1) Manufacturer's name.
- 2) Local representative.
- 3) Contact name, telephone number(s), and email address.

D. Software Manuals: Provide hard copies of all software manuals and program listings associated with equipment to be provided in the process instrumentation and control system.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01 78 39**  
**RECORD DRAWINGS AND INFORMATION**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies providing marked up and record documents and information.

**1.02 SUBMITTALS**

- A. Procedures: Section 01 33 00, “Contractor Submittals.”
- B. Marked up Drawings, Specification Sections, and other record information.
- C. Final version of Record Drawings and other record information as part of Substantial Completion process.
- D. Record information may be submitted using the Web-based electronic submittal system.

**PART 2 – PRODUCTS**

**2.01 GENERAL**

- A. Marked-Up Drawings: Maintain a clean full-size 34-inch by 22-inch copy of marked up drawings in the Contractor’s project office. Torn and ripped or unreadable field copies are not acceptable for this use. Mark up drawings on a daily basis. Provide District updated and corrected information on a set of full size color copies of drawings on an every other month basis to reflect the “as constructed” conditions for the prior two months. Mark contract drawings using the devices described herein. In addition, drawing updates are required to provide an on-going reflection of the project status as the new pipeline is constructed and put into service and the old pipe line abandoned. Make the Marked Up Drawings, Specification Sections, and other record information available for review at the District’s field office at all times to show:
  - 1. Work accomplished to verify payment due.
  - 2. Field changes of dimensions and details made by Contractor.
  - 3. Changes made by Change Order or Field Order.
  - 4. Dimensional location of all buried and concealed utilities, including all other utilities whether shown on the Drawings or not, as moved or placed by Contractor.
- B. The Contractor’s Record Drawings will be reviewed monthly by the Engineer for completeness prior to preparing the progress estimate for payment. If the Record Drawings do not reflect the work performed, a portion of the payment for that item of work will be withheld from the progress estimate.

- C. Construction Detail Records: provide original plots on 11-inch by 17-inch of information prepared by the Contractor for construction or installation which is supplemental to the details on the Drawings. Reference appropriate Drawings which show the work. Drawings shall be in paper format for the following:
  - 1. Details not shown on the original drawings but required for constructing the facility including utility conflict resolution details, etc.
  - 2. Other Information as required in other sections.
- D. Marked-Up Specifications: Provide marked-up set of Specifications with changes made by Change Order, Field Order, or by the Contractor.
- E. Record Drawings: Provide one final copy of the marked up drawings showing all of the record information on a set of full size drawings to reflect the "as constructed" conditions. Mark contract drawings using the devices described herein. These drawing updates are intended to provide a final and comprehensive reflection of the constructed new and abandoned pipes and all of the utilities encountered during construction.

## **PART 3 – EXECUTION**

### **3.01 MARKING DEVICES**

- A. Waterproof felt tip pens as required to maintain as-built drawings described in this section using the following color coding:
  - 1. Red: Additions.
  - 2. Blue: Comments.
  - 3. Green: Deletions.
  - 4. Black: Dimensions

### **3.02 RECORDING**

- A. Record information concurrently with construction progress. No work shall be concealed until the required information is recorded. Be cautioned against ordering concrete or CDF until items concealed by the placement of the concrete or CDF are recorded on the drawings specified in this section. Should the concrete or CDF be placed without the concealed items recorded, payment may not be made for the concrete or CDF.
- B. The following actual construction items shall be recorded on the Drawings:
  - 1. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements or surveyed to provide horizontal and vertical coordinates. Minimum requirements for accuracy specified in the following:
    - a. Pipes and Casings:
      - 1) Type of pipe.
      - 2) Location to the nearest 0.25-foot horizontal.

- 3) Length between structures to the nearest 0.25 foot.
- 4) Slopes based on invert elevations.
- 5) Pipe sizes to the nearest 1-inch inside diameter.

### **3.03 DELIVERY TO PROJECT REPRESENTATIVE**

- A. Record Drawings will be used to verify and document progress. Work not included in the Record Drawings will not be included for payment in progress payment requests.
- B. Prior to request for notice for substantial completion of any portion of the new sewer on the project, the Contractor shall transmit Record Documents including Contract title, date, Contractor's name and address, index with title and number of each record document, statement indicating completion of record information for specific areas or, if for project close-out, that the documentation is completed and in compliance with Contract requirements as attested by the signature of the Contractor.
- C. Hard copy record documents shall be submitted within one month of any portion of the new piping put into service.

### **END OF SECTION**

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**SECTION 01 99 90**  
**REFERENCE FORMS**

**PART 1 – GENERAL**

**1.01 FORMAT**

- A. Electronic Versions: Engineer will provide, upon request, all forms in Microsoft Word format for Contractor's use on this project.
- B. Forms with project specific information will be issued to Contractor at Preconstruction Conference.

**1.02 FORMS**

- A. Shop Drawing Transmittal
- B. Testing Results Transmittal
- C. Operation and Maintenance Manual Review Check List
- D. Maintenance Summary
- E. Motor Data Form
- F. Manufacturer's Installation Certification
- G. Equipment Test Report Form
- H. Maintenance of Plant Operation (MOPO)

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

**(FORMS FOLLOW)**

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# Shop Drawing Transmittal

Transmittal No.: \_\_\_\_\_

To: Parametrix  
1019 39th Avenue SE Suite 100  
Puyallup, WA, 98374  
ATTN: \_\_\_\_\_

Date: \_\_\_\_\_

Project: MBR Treatment Facility Upgrade

Project No.: 216-1598-102

Owner: Tulalip Tribes

Location: Snohomish County, WA

Previous Transmittal No. (if resubmitted): \_\_\_\_\_

## USE ONE FORM PER ITEM SUBMITTED

| Qty. | Spec.<br>Para.<br>No. | Spec.<br>Page<br>No. | Item Description and Use | Manufacturer | Dwg.<br>No(s). | Approval<br>Status<br>(Engineer) |
|------|-----------------------|----------------------|--------------------------|--------------|----------------|----------------------------------|
|      |                       |                      |                          |              |                |                                  |
|      |                       |                      |                          |              |                |                                  |
|      |                       |                      |                          |              |                |                                  |

By this submittal, the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each Shop Drawing with the project requirements and of the Contract Documents. Deviations from the Contract Documents are noted below.

Deviations \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contractor \_\_\_\_\_ Signature: \_\_\_\_\_

## (THIS SPACE FOR ENGINEER)

To \_\_\_\_\_ Date: \_\_\_\_\_

: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Enclosed are \_\_\_\_\_ copies of the above item. Approval status as noted above is in accordance with the following legend:

1. No Exceptions Taken
2. Note Markings
3. Comments Attached - Confirm
4. Comments Attached - Resubmit
5. Rejected
6. Received For Information Only

**PARAMETRIX, INC.**

By: \_\_\_\_\_

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## Testing Results Transmittal

**To:** Parametrix, Inc.  
1019 39th Avenue SE, Suite 100  
Puyallup, WA 98374  
Attn:

**Date:** \_\_\_\_\_

**Project:** MBR Treatment Facility Upgrade

**Project No.:** 216-1598-102

**Owner:** Tulalip Tribes

**Location:** Snohomish County, WA

**Laboratory Name and Address:** \_\_\_\_\_

Attach original copy of laboratory results and submit one form for each type of test conducted.

### Use One Form for Each Type of Test Conducted:

| Type<br>of Test | Date  | Person<br>Taking<br>Sample | Location/<br>Station | Test<br>Results | Comments |
|-----------------|-------|----------------------------|----------------------|-----------------|----------|
| _____           | _____ | _____                      | _____                | _____           | _____    |
| _____           | _____ | _____                      | _____                | _____           | _____    |
| _____           | _____ | _____                      | _____                | _____           | _____    |
| _____           | _____ | _____                      | _____                | _____           | _____    |
| _____           | _____ | _____                      | _____                | _____           | _____    |
| _____           | _____ | _____                      | _____                | _____           | _____    |

### Deviations or Additional Comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Contractor's Representation:

Company Name: \_\_\_\_\_

Printed name of Contractor's  
responsible person submitting results: \_\_\_\_\_

Signature: \_\_\_\_\_

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# Operation and Maintenance Manual Review Check List

Equipment: \_\_\_\_\_ Submittal No.: \_\_\_\_\_

Specification Section: \_\_\_\_\_ Project: MBR Treatment Facility Upgrade

## MANUAL FORMAT

- |                                                                    |                                                                                       |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <input type="checkbox"/> Three Ring Binder, Plastic Covers (final) | <input type="checkbox"/> System/Equipment Title                                       |
| <input type="checkbox"/> Heavy Paper Covers (preliminary)          | <input type="checkbox"/> Contractor Name, Address, Phone Number                       |
| <input type="checkbox"/> 8-1/2" x 11", Folded 11" x 17"            | <input type="checkbox"/> Title Page                                                   |
| <input type="checkbox"/> No Odd Size Envelopes                     | <input type="checkbox"/> Table of Contents                                            |
| <input type="checkbox"/> White Paper (20-lb)                       | <input type="checkbox"/> Volume X of Y                                                |
| <input type="checkbox"/> Printed or Typewritten                    | <input type="checkbox"/> Section Dividers with Numbered Plastic Reinforced Index Tabs |
| <input type="checkbox"/> Hole Punched                              | <input type="checkbox"/> Sections Ordered Same as Specification                       |
| <input type="checkbox"/> Project Title                             |                                                                                       |

## MANUAL CONTENT

- |                                                                              |                                                     |
|------------------------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Each Item of Equipment/System                       | <u>Instructions:</u>                                |
| <input type="checkbox"/> Equipment/System Description                        | <input type="checkbox"/> Handling                   |
| <input type="checkbox"/> Controls Description                                | <input type="checkbox"/> Storage                    |
| <input type="checkbox"/> Curves, Data                                        | <input type="checkbox"/> Installation               |
| <input type="checkbox"/> Parts List, Assembly Drawings, Part Numbers         | <input type="checkbox"/> Testing                    |
| <input type="checkbox"/> Drawings (spatial/mechanical/assembly)              | <input type="checkbox"/> Operating                  |
| <input type="checkbox"/> Spec Section and Product Name on Drawings/Envelopes | <input type="checkbox"/> Maintenance                |
| <input type="checkbox"/> Diagrams (control/flow)                             | <input type="checkbox"/> Shutdown                   |
| <input type="checkbox"/> Safety Information                                  | <u>Maintenance Summary Forms:</u>                   |
| <input type="checkbox"/> Troubleshooting Guide                               | <input type="checkbox"/> Correct Form Used          |
| <input type="checkbox"/> Inapplicable Data (crossed out or deleted)          | <input type="checkbox"/> 8-1/2" x 11"               |
| <input type="checkbox"/> Spare Parts Ordering Instructions                   | <input type="checkbox"/> Typewritten                |
| <input type="checkbox"/> Copies of Warranties, Bonds, Service Agreements     | <input type="checkbox"/> Form Completely Filled Out |
| <input type="checkbox"/> Factory Test Results                                | <input type="checkbox"/> Form for Each Unit         |
|                                                                              | <input type="checkbox"/> Lubrication Instructions   |
|                                                                              | <input type="checkbox"/> Recommended Spare Parts    |

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## Maintenance Summary

**PROJECT:** MBR Treatment Facility Upgrade

**CONTRACT NO.:** Xx

**1. Equipment Item:**

**2. Manufacturer:**

**3. Equipment/Tag No.(s):**

**4. Weight of Individual Components  
(Over 100 Pounds):**

**5. Nameplate Data**  
(hp, voltage, speed, etc.):

**6. Manufacturer's Local Representative:**

a. Name: \_\_\_\_\_ Telephone No.: \_\_\_\_\_

b. Address:

## 7. Maintenance Requirements:

[illegible]

## Maintenance Summary (Continued)

### 8. Lubricant List:

| <u>Reference<br/>Symbol</u>          | <u>Shell</u>                                                                                     | <u>Standard<br/>Oil</u> | <u>Gulf</u> | <u>Arco</u> | <u>Or<br/>Equal</u> |
|--------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------|-------------|-------------|---------------------|
| List symbols used<br>in No. 7 above. | List equivalent lubricants as distributed by each manufacturer for the specific use recommended. |                         |             |             |                     |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |
| _____                                | _____                                                                                            | _____                   | _____       | _____       | _____               |

### 9. Recommended Spare Parts for Owner's Inventory:

| <u>Part No.</u> | <u>Description</u> | <u>Unit</u> | <u>Quantity</u> | <u>Unit Cost</u> |
|-----------------|--------------------|-------------|-----------------|------------------|
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |
| _____           | _____              | _____       | _____           | _____            |

NOTE: Identify parts provided by this Contract with two asterisks.



# Motor Data Form

Equipment Name: \_\_\_\_\_ Equipment No.: \_\_\_\_\_

Site Location: \_\_\_\_\_

## Nameplate Markings:

Mfr: \_\_\_\_\_ Mfr Model: \_\_\_\_\_ Frame: \_\_\_\_\_ HP: \_\_\_\_\_  
Volts: \_\_\_\_\_ Phase: \_\_\_\_\_ RPM: \_\_\_\_\_ Service Factor: \_\_\_\_\_  
FLA: \_\_\_\_\_ LRA: \_\_\_\_\_ Frequency: \_\_\_\_\_ Ambient Temp Rating: \_\_\_\_\_ Degrees C  
Time Rating: \_\_\_\_\_ Design Letter: \_\_\_\_\_  
(NEMA MG1-10.35) (NEMA MG-1.16)  
KVA Code Letter: \_\_\_\_\_ Insulation Class: \_\_\_\_\_

The following information is required for explosion-proof motors only:

- A. Approved by UL for installation in Class \_\_\_\_\_, Division \_\_\_\_\_.
- B. UL frame temperature code \_\_\_\_\_; Group \_\_\_\_\_ Atmosphere (NEC Tables 500-s and 500-s(b)).

The following information is required for high efficiency motors only:

- A. Guaranteed minimum efficiency at full load or NEMA efficiency index:

\_\_\_\_\_  
(NEMA MG1-12.53b)

- B. Nameplate or nominal efficiency: \_\_\_\_\_

## Data Not Necessarily Marked on Nameplate:

Type of Enclosure: \_\_\_\_\_ Enclosure Material: \_\_\_\_\_

Temp Rise: \_\_\_\_\_ Degrees C (NEMA MG1-12.41,42)

Space heater included? ☐ Yes ☐ No

If Yes, Watts: \_\_\_\_\_ Volts: \_\_\_\_\_

Type of rotor winding over-temperature protection, if specified:

\_\_\_\_\_  
Use the space below to provide additional information on other motor modifications, if specified:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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## MANUFACTURER'S INSTALLATION CERTIFICATION

**Contract:** MBR Treatment Facility Upgrade **Specification Section:** \_\_\_\_\_

**Owner:** Tulalip Tribes

**Contractor:** \_\_\_\_\_

**Equipment Name:** \_\_\_\_\_ **Equipment No.:** \_\_\_\_\_

**Manufacturer:** \_\_\_\_\_

The undersigned manufacturer of the equipment item described above hereby certifies that he has checked the installation of the equipment and that the equipment, as specified in the contract, has been provided in accordance with the manufacturer's recommendations and that the trial operation of the equipment item has been satisfactory and meets the contract requirements.

**Comments** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Date Manufacturer

\_\_\_\_\_  
Date Signature of Authorized Representative

\_\_\_\_\_  
Date Contractor

\_\_\_\_\_  
Date Signature of Authorized Representative

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Note: This example equipment test report is provided for the benefit of the Contractor and is not specific to any piece of equipment to be installed. The example is furnished, as a means of illustrating the level of detail required for the preparation of equipment test report forms.

Equipment Name: \_\_\_\_\_

Equipment Number: \_\_\_\_\_

Specification Reference: \_\_\_\_\_

Location: \_\_\_\_\_

## PREOPERATIONAL CHECKLIST

### MECHANICAL

|                                                  | Contractor      |             | Vendor          |             | Project Rep     |             |
|--------------------------------------------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
|                                                  | <b>Verified</b> | <b>Date</b> | <b>Verified</b> | <b>Date</b> | <b>Verified</b> | <b>Date</b> |
| Lubrication                                      |                 |             |                 |             |                 |             |
| Alignment                                        |                 |             |                 |             |                 |             |
| Anchor Bolts                                     |                 |             |                 |             |                 |             |
| Seal Water System Operational                    |                 |             |                 |             |                 |             |
| Equipment Rotates Freely                         |                 |             |                 |             |                 |             |
| Safety Guards                                    |                 |             |                 |             |                 |             |
| Valves Operational                               |                 |             |                 |             |                 |             |
| O&M Manual Information Complete                  |                 |             |                 |             |                 |             |
| Manufacturer's Installation Certificate Complete |                 |             |                 |             |                 |             |
|                                                  |                 |             |                 |             |                 |             |
|                                                  |                 |             |                 |             |                 |             |
|                                                  |                 |             |                 |             |                 |             |

**ELECTRICAL** (Circuit Ring-Out and High-Pot Tests)

|                                   | Contractor      |             | Vendor          |             | Project Rep     |             |
|-----------------------------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
|                                   | <b>Verified</b> | <b>Date</b> | <b>Verified</b> | <b>Date</b> | <b>Verified</b> | <b>Date</b> |
| Circuits:                         |                 |             |                 |             |                 |             |
| Power to MCC                      |                 |             |                 |             |                 |             |
| Control to HOA                    |                 |             |                 |             |                 |             |
| Indicators at MCC:                |                 |             |                 |             |                 |             |
| Red (Running)                     |                 |             |                 |             |                 |             |
| Green (Power)                     |                 |             |                 |             |                 |             |
| Amber (Auto)                      |                 |             |                 |             |                 |             |
| Indicators at Local Control Panel |                 |             |                 |             |                 |             |
| Wiring Labels Complete            |                 |             |                 |             |                 |             |
| Nameplates:                       |                 |             |                 |             |                 |             |
| MCC                               |                 |             |                 |             |                 |             |
| Control Station                   |                 |             |                 |             |                 |             |
| Control Panel                     |                 |             |                 |             |                 |             |
| Equipment Bumped for Rotation     |                 |             |                 |             |                 |             |
|                                   |                 |             |                 |             |                 |             |
|                                   |                 |             |                 |             |                 |             |
|                                   |                 |             |                 |             |                 |             |

**PIPING SYSTEMS**

|                                   | Contractor      |             | Vendor          |             | Project Rep     |             |
|-----------------------------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
|                                   | <b>Verified</b> | <b>Date</b> | <b>Verified</b> | <b>Date</b> | <b>Verified</b> | <b>Date</b> |
| Cleaned and Flushed:              |                 |             |                 |             |                 |             |
| Suction                           |                 |             |                 |             |                 |             |
| Discharge                         |                 |             |                 |             |                 |             |
| Pressure Tests                    |                 |             |                 |             |                 |             |
| Temporary Piping Systems in Place |                 |             |                 |             |                 |             |
|                                   |                 |             |                 |             |                 |             |
|                                   |                 |             |                 |             |                 |             |
|                                   |                 |             |                 |             |                 |             |

## INSTRUMENTATION AND CONTROLS

|                                         | Contractor |      | Vendor   |      | Project Rep |      |
|-----------------------------------------|------------|------|----------|------|-------------|------|
|                                         | Verified   | Date | Verified | Date | Verified    | Date |
| Flowmeter Calibration:                  |            |      |          |      |             |      |
| Calibration Report No.                  |            |      |          |      |             |      |
| Flow Recorder Calibrated:               |            |      |          |      |             |      |
| Against Transmitter                     |            |      |          |      |             |      |
| VFD Speed Indicator Calibrated Against: |            |      |          |      |             |      |
| Independent Reference                   |            |      |          |      |             |      |
| Discharge Over-Pressure Shutdown:       |            |      |          |      |             |      |
| Switch Calibration                      |            |      |          |      |             |      |
| Simulate Discharge Over-pressure:       |            |      |          |      |             |      |
| Shutdown                                |            |      |          |      |             |      |
|                                         |            |      |          |      |             |      |
|                                         |            |      |          |      |             |      |
|                                         |            |      |          |      |             |      |

## **INITIAL OPERATION**

### MECHANICAL

|                                          | Contractor |      | Vendor   |      | Project Rep |      |
|------------------------------------------|------------|------|----------|------|-------------|------|
|                                          | Verified   | Date | Verified | Date | Verified    | Date |
| Motor Operation Temperature Satisfactory |            |      |          |      |             |      |
| Pump Operating Temperature Satisfactory  |            |      |          |      |             |      |
| Unusual Noise, Etc.                      |            |      |          |      |             |      |
| Pump Operation:                          |            |      |          |      |             |      |
| Measurement:                             |            |      |          |      |             |      |
| Flow                                     |            |      |          |      |             |      |
| Pressure                                 |            |      |          |      |             |      |
| Test Gauge Number                        |            |      |          |      |             |      |
| Alignment Hot                            |            |      |          |      |             |      |
| Doweled In                               |            |      |          |      |             |      |
|                                          |            |      |          |      |             |      |
|                                          |            |      |          |      |             |      |
|                                          |            |      |          |      |             |      |

Remarks: \_\_\_\_\_

\_\_\_\_\_

## ELECTRICAL

|                                               | Contractor |      | Vendor   |      | Project Rep |      |
|-----------------------------------------------|------------|------|----------|------|-------------|------|
|                                               | Verified   | Date | Verified | Date | Verified    | Date |
| Local Switch Function:                        |            |      |          |      |             |      |
| Runs in HAND                                  |            |      |          |      |             |      |
| No Control Power in OFF                       |            |      |          |      |             |      |
| Timer Control in AUTO                         |            |      |          |      |             |      |
| Overpressure Protection Switch:               |            |      |          |      |             |      |
| Functional in both HAND and AUTO              |            |      |          |      |             |      |
| Overpressure Protection Switch Set at 75 psig |            |      |          |      |             |      |
| PLC Set at 24 Hour Cycle, 25 Minutes ON       |            |      |          |      |             |      |

## **OPERATIONAL TEST**

48-hour continuous test. Pump cycles as specified, indicators functional, controls functional, pump maintains capacity, over pressure protection remains functional, hour meter functional.

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## **RECOMMENDED**

\_\_\_\_\_  
Contractor Representative

\_\_\_\_\_  
Date

## **ACCEPTED**

\_\_\_\_\_  
Project Representative

\_\_\_\_\_  
Date



# MOPO

## Maintenance of Plant Operation

Date MOPO Submitted

Shutdown Date/ Time

Shutdown Duration

Walk Through Date

MOPO Number

Contractor/Sub

Project

MOPO Written By

Owner

Cell Phone

Site Name

Revision #

Site Address

Approved Date

### MOPO Description/Activities

| #  | Step Description/Activity | Time | Date | Name/Title |
|----|---------------------------|------|------|------------|
| 1  |                           |      |      |            |
| 2  |                           |      |      |            |
| 3  |                           |      |      |            |
| 4  |                           |      |      |            |
| 5  |                           |      |      |            |
| 6  |                           |      |      |            |
| 7  |                           |      |      |            |
| 8  |                           |      |      |            |
| 9  |                           |      |      |            |
| 10 |                           |      |      |            |
| 11 |                           |      |      |            |
| 12 |                           |      |      |            |
| 13 |                           |      |      |            |
| 14 |                           |      |      |            |
| 15 |                           |      |      |            |

### Items that need to be addressed

|   |  |  |  |
|---|--|--|--|
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |

### SAFETY

|   |  |  |  |
|---|--|--|--|
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |

### Emergency Contact Information

|   | Name | Company/Entity | Cell |
|---|------|----------------|------|
| 1 |      |                |      |
| 2 |      |                |      |
| 3 |      |                |      |
| 4 |      |                |      |
| 5 |      |                |      |
| 6 |      |                |      |
| 7 |      |                |      |

Parametrix - Revised December 18, 2017.

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Division 02  
Existing Conditions



**SECTION 02 20 10**  
**SUBSURFACE INVESTIGATION**

**PART 1 – GENERAL**

**1.01 SOIL REPORTS**

- A. The following geotechnical information is provided in its entirety in the Appendices of these Contract Documents:
  - 1. GRI, "Geotechnical Engineering Report, Tulalip Tribes Wastewater Treatment Facilities, Tulalip, Washington."
- B. Any data on soil and/or subsurface conditions shown in the Plans or Specifications is not to be taken as a representation, but is based on limited information and is at best only an opinion; consequently, such data cannot be considered precise or complete and there is no guarantee as to its completeness, accuracy, or precision.
- C. Additional Investigation:
  - 1. Contractor should visit the site and acquaint himself with site conditions before submitting a bid and the submission of a bid will be prima facie evidence that he has done so.
  - 2. Prior to bidding, Contractor may make his own subsurface investigations to satisfy himself with site and subsurface conditions. The Contractor shall be responsible for obtaining approval from the Owner before performing any exploratory excavations.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 02 22 00**  
**EARTHWORK**

**PART 1 – GENERAL**

**1.01 SCOPE**

- A. This section describes general requirements for all types of earthwork required on the project.
- B. Contractor shall provide all construction and subsequent removal of all shoring, cribs, and cofferdams that may be necessary for protection of existing structures, excavation, removal, construction of structures, placement, and compaction of backfill.
- C. Contractor shall provide disposal site for all native material not used on site.

**1.02 CLASSIFICATION**

- A. All excavation is unclassified. The terms “earthwork” or “excavation” include all materials excavated or removed, regardless of material characteristics. Contractor shall make his own estimate of the kind and extent of materials that will be encountered in the excavation.
- B. All fill, backfill, and embankment at site shall be compacted structural fill. This applies to usable native soil and all import materials, but does not apply to topsoil for landscaping purposes.
- C. The terms “fill,” “backfill,” and “embankment” shall be considered as having the same meaning.

**1.03 QUALITY CONTROL ASSURANCE**

- A. Soils and Backfill: Moisture density standard ASTM D1557 or AASHTO T180 method unless otherwise specifically approved.
- B. In-place Density Determination: Sandcone Method ASTM D1556 or Nuclear Method ASTM D2922.
  - 1. Foundation and Embankment Under Structures and Backfill Zone Around the Structure’s Wall and Other Embankment: See notes on Plans.
  - 2. Subgrade: One test for every 3,000 square feet, or two tests total, whichever is greater for each roadway or structure.
  - 3. Foundation and Embankment Under Pipelines: For each 1 foot of vertical embankment or backfill height, conduct one test for every 1,000 square feet along the pipeline.
- C. Classification of Soils: ASTM D2487.

- D. On-site quality control monitoring of subgrade backfill and embankment materials and construction by certified independent laboratory approved, secured, and paid for by the Owner.
- E. Subgrade surface tolerance by true level straight edge.
- F. The Engineer will identify areas requiring over-excavation and backfill and review excavated material to determine its suitability as backfill material.

#### **1.04 SUBMITTALS**

- A. Sample of each import material for gradation and moisture density compaction curve test reports.
- B. Los Angeles abrasion test results for crushed rock material.
- C. Embankment and native backfill materials gradation and moisture density standards curve test reports.
- D. Certification of gradation and compliance with referenced standards and moisture density standard test reports.
- E. Density test results in approved format.
- F. If at any time the Contractor changes the source and/or stockpile from which materials are obtained, samples and certifications of gradation for these new sources will be submitted at no additional cost to the Owner.
- G. During construction, the Owner may elect to have further gradation testing completed on the materials being furnished by the Contractor. This testing will be at the expense of the Owner. These material samples will be furnished from material available on the job site or from the Contractor's source and/or supplier.
- H. Submittals shall be in accordance with Section 01 33 00.

### **PART 2 – PRODUCTS**

#### **2.01 NATIVE MATERIAL**

- A. Use: Embankment, or subsequent backfill for pipe where approved by Engineer. Native material shall not be used beneath foundations, roadways, floor slabs, or bottom of buried structures. It is not expected that any of the native material will be approved as equal to WSDOT Section 9.3.14(1).
- B. Selected predominantly granular soil free from organic material and debris, and reasonably well-graded from fine to coarse particles. Silt or clay shall not be used. Percent passing U.S. No. 200 sieve, by weight, shall be 0 to 3 percent.
- C. Maximum Size: 1-1/2 inches.

- D. Free of excess moisture.
- E. Processed to uniform moisture and texture necessary to obtain specified density and to provide a dense, non-yielding soil structure.

## 2.02 IMPORT MATERIAL

### A. Structural Fill:

- 1. Use: Embankment, foundation, subgrade, structural fill, and backfill beneath footings, floor slabs, and beneath bottom of structures.
- 2. Description: Imported structural fill shall consist of crushed surfacing base course and top course material meeting WSDOT Section 9-03.9(3).

### B. Crushed Surfacing Courses:

- 1. Crushed surfacing top course in accordance with WSDOT 9-03.9 (3).
- 2. Crushed surfacing base course in accordance with WSDOT 9-03.9 (3).

### C. Gravel Backfill:

- 1. Use: Structural backfill for walls and trench backfill.
- 2. Trench backfill shall be select native material or gravel backfill for foundations, Class B, per WSDOT Section 9-03.12(1)B.

### D. Bedding Material for Utilities:

- 1. Use: Bedding material for water, drain, and storm drain.
- 2. Bedding materials shall be crushed surfacing top course in accordance with WSDOT Section 9-03.9(3), "Crushed Surfacing."

### E. Foundation Material:

- 1. Foundation gravel shall contain no pieces larger than 4 inches, measured along the line of greatest dimension, and shall meet the following specification for grading and quality.

| Sieve Size Square Opening | Percent Passing |
|---------------------------|-----------------|
| 2-1/2"                    | 98 – 100        |
| 2"                        | 92 – 100        |
| 1-1/2"                    | 72 – 87         |
| 1-1/4"                    | 58 – 75         |
| 3/4"                      | 27 – 47         |
| 3/8"                      | 3 – 14          |
| No. 4                     | 0 – 1           |



### **2.03 GEOTEXTILE FABRIC (FILTER FABRIC)**

- A. Geotextile fabric shall be a woven polypropylene geotextile for separation and subgrade reinforcement. Fabric shall be Mirafi 500X, Carthage Mills FX-55, or approved equivalent with the following minimum properties:
  - 1. Grab strength (130 lbs.).
  - 2. Puncture strength (ASTM D751 – 40 lbs.).
  - 3. Burst strength (ASTM D751 – 210 psi).

### **2.04 WASTE MATERIALS**

- A. Foreign materials, buried rubble, abandoned pipes, and native soil materials that cannot be processed to meet material specifications and to achieve specified densities shall be disposed of by the Contractor at an appropriate waste site. Waste sites shall be provided by the Contractor.

### **2.05 SOIL STERILANT**

- A. Polyborchlorate.

## **PART 3 – EXECUTION**

### **3.01 WORK SEQUENCE**

- A. Notify Engineer of any discrepancies between contractual requirements and site conditions prior to start of work.
- B. Maintain backfill, embankment, and subgrade zones or lifts open until approval of testing is secured from Engineer. Any work covered up prior to approval shall be excavated and reconstructed at Contractor's expense.

### **3.02 USE OF MATERIALS**

- A. Materials shall be placed in accordance with the following schedule unless otherwise specified.
- B. Schedule:

| <b>Location</b>                                                    | <b>Material</b>              | <b>Specification Paragraph(s)</b> |
|--------------------------------------------------------------------|------------------------------|-----------------------------------|
| Embankment under concrete slabs, as specified or shown on Drawings | Crushed Surfacing Top Course | 2.02.B                            |
| Pipe Bedding                                                       | Crushed Surfacing Top Course | 2.02.D                            |

### 3.03 STOCKPILING NATIVE MATERIALS FOR REUSE

- A. Material suitable for reuse on-site shall be deposited in approved, protected, maintained piles separate from other materials and readily available. Upon completion, all material storage areas shall be restored to substantially their original condition.

### 3.04 COMPACTION REQUIREMENTS

- A. All compaction shall achieve a dense, nonyielding soil.

| <u>Percent of Maximum<br/>Dry Density ASTM D1557</u> | <u>Location of Material</u>                                                           |
|------------------------------------------------------|---------------------------------------------------------------------------------------|
| 95 percent minimum                                   | Top of subgrade to 12 inches below top of subgrade under roadway pavement structure.  |
| 95 percent minimum                                   | Structural backfill (Embankments, adjacent to structures, under structures).          |
| 95 percent minimum                                   | Import material under structures.                                                     |
| 95 percent minimum                                   | Pipe bedding material.                                                                |
| 95 percent minimum                                   | Top 4 feet of trench backfill under roadway.                                          |
| 95 percent minimum                                   | Top 12 inches of excavated subgrade to receive structural fill for paving area.       |
| 95 percent minimum                                   | Top 12 inches of excavated and proof-rolled subgrade beneath structures.              |
| 88 percent minimum                                   | All other fill, except as otherwise shown and excluding topsoil used for landscaping. |

- B. Compaction requirements are based on percent of maximum dry density, ASTM D1557.
- C. When working in an existing traveled roadway, restoration and compaction must be achieved as the trench is backfilled so as to maintain traffic.
- D. The mechanical method of compaction shall be at Contractor's option, providing the Contractor can meet the required compaction.
- E. Water settling is not acceptable as a method of compaction.
- F. Contractor shall be responsible to provide the proper size and type of compaction equipment and select the proper method of utilizing said equipment to attain the required compaction density while protecting the pipe or structure being backfilled.
- G. In-place compaction tests will be made by the independent laboratory. Contractor shall remove and replace or recompact material that does not meet specified requirements.

### **3.05 EXCAVATION, EMBANKMENT, SUBGRADE CONSTRUCTION OPERATIONS**

- A. Work in inclement wet weather is at Contractor's risk.
- B. Any materials that the Engineer observes to become unstable as the result of selection of techniques, equipment, or operations during inclement wet weather shall be replaced at Contractor's expense with import material.
- C. Construct shoring, structural supports, or excavated slopes to conform to applicable codes.
- D. Site Preparations for new structures and paved areas (includes piping and related structures):
  - 1. Excavations and embankment (fill or backfill) shall be accomplished in such a manner that drainage is maintained at all times.
  - 2. Both excavation and embankment shall be constructed to the lines and grades shown on the Drawings.
  - 3. Clearing and grubbing shall be followed by stripping (excavation) of underlying soils that contain roots or other organic matter.
  - 4. Following stripping at structure locations, excavate deeper to remove all soft and loose soils, existing fill, and other unsuitable matter to expose medium dense, stiff, or more competent natural subgrade soils. For paved areas, excavate to remove all soft compressible and unstable soils to achieve a firm subgrade.
  - 5. Excavations shall extend beyond proposed structure or paving lines at least 5 feet in addition to extending beneath areas to receive structural fill.
  - 6. For other site soils, proof-roll and compact excavated subgrade to dense, unyielding surface and to the specified densities. Remove any soft or unstable material detected by proof-rolling. Place structural fill, if needed, to achieve planned grades.
  - 7. Foundation subgrades shall consist of compacted structural fill or medium dense, stiff, or competent original ground, nonorganic soils. Each foundation-bearing surface shall be cleaned of all loose, soft, and disturbed soil and leveled.

### **3.06 EXECUTION – UTILITIES**

- A. Trenching:
  - 1. Material shall be excavated from trenches and piled adjacent to the trench and maintained so that the toe of the slope of the spoil material is at least 2 feet from the edge of the trench.
  - 2. Material shall be piled in such a manner that will cause a minimum of inconvenience to public travel.

3. Free access shall be provided to all fire hydrants, water valves, and meters and clearance shall be left to enable the free flow of stormwater in all gutters, conduits, and natural watercourses.
4. Ledge rock, boulders, or stones shall be removed to provide a minimum clearance of 6 inches under and around the pipe.
5. Contractor shall keep excavations free of water.
6. Contractor is responsible for all shoring.
7. Trenches must be of sufficient width to permit proper jointing of the pipe and backfilling of material along the sides of the pipe.
8. Trenches wider than the maximum specified may result in a greater load of overburden than the pipe is designed for, and consequently, if the maximum trench width is exceeded by the Contractor, the Contractor shall at his own expense, provide pipe of higher strength classification, or provide a higher class of bedding where necessary to assure that the pipe will not be overloaded.
9. Excavation for manholes and other structures shall be sufficient to provide a minimum of 12 inches between their outside surfaces and the sides of the excavation, unless otherwise shown on the Drawings.
10. Trenches shall be excavated below the barrel of the pipe a sufficient distance to provide for bedding material specified.

B. Pipe Bedding:

1. Proper preparation of subgrade, placement of foundation material where required and partial placement of bedding material shall precede the installation of all pipe and conduit. This shall include the necessary preparation of the native trench bottom or the top of the foundation material as well as placement and compaction of required bedding material to a uniform grade. Pipe bedding material around the pipe will be placed in a manner to meet requirements specified herein.
2. The pipe bedding shall be placed so that the entire length of the pipe will have full bearing on the bedding. No blocking of any kind shall be used to adjust the pipe to grade except where used with embedment concrete. Bell holes shall be dug to assure uniform support along the pipe barrel.
3. It may be necessary to change bedding classifications and the limits thereof during the process of the construction, consistent with the requirements outlined under the definitions and requirements of the various classifications contained herein.
4. Where unauthorized excavation has been made below the established grade, the Contractor shall provide, place, and compact suitable bedding or foundation material to the proper grade elevation at Contractor's expense.
5. Compaction equipment used shall be of a type that does not injure the pipe.
6. Pipe bedding to 6 inches minimum over the top of the pipe shall be completed before backfilling operations are started.

C. Trench Backfilling:

1. Contractor shall take all necessary precautions to protect the pipe from any damage, movement, or shifting. In general, backfilling shall be performed by pushing the material from the end of the trench into, along, and directly over the pipe so that the material will be applied in the form of a rolling slope rather than by side filling, which may damage the pipe. Backfilling from the sides of the trench will be permitted after sufficient material has first been carefully placed over the pipe to such a depth to protect the pipe.
2. Compaction equipment used shall be of a type that does not injure the pipe.
3. Provide for the proper maintenance of traffic flow and accessibility as may be necessary.
4. Make adequate provisions for the safety of property and persons.
5. Temporary cribbing, sheeting, or other timbering shall be removed unless specifically authorized in writing.
6. Dewatering shall be continued until the trench is completely backfilled.
7. Brush, stumps, logs, planking, disconnected drains, boulders, etc., shall be removed from the material to be used for backfilling the trench.
8. Where original excavated material is unsuitable for trench backfill, import material shall be placed. The unsuitable material shall be removed and disposed by the Contractor.
9. Trench backfill shall be placed to the elevations shown on the Drawings.
10. All surplus material due shall be hauled to a permitted waste site obtained by the Contractor and shall be considered incidental to applicable bid item.

D. Subsequent Backfill to Finished Subgrade:

1. Improved Areas:
  - a. Place in lifts not exceeding 8 inches.
  - b. Compact to specified density.
  - c. Trenches located in areas where import materials have been previously installed shall be backfilled with same type import material as excavated.
2. Unimproved Areas:
  - a. Place in lifts not exceeding 12 inches.
  - b. Compact to specified density.
  - c. Trenches located in areas where import materials have been previously installed shall be backfilled with same type import material as excavated.

### **3.07 GENERAL COMPACTION REQUIREMENTS**

- A. Compaction requirements are based on percent of maximum dry density, ASTM D1557.
- B. Requirements of this section shall apply unless more stringent requirements are established by the local agency involved.
- C. When working in an existing traveled roadway, restoration and compaction must be achieved as the trench is backfilled so as to maintain traffic.
- D. Trench backfill under roadway or other improvements shall be mechanically compacted.
- E. Compaction shall be in accordance with Section 02 22 00.

### **3.08 COMPACTION**

- A. The mechanical method of compaction shall be at Contractor's option, providing the Contractor can meet the requirements of paragraphs 3.08 and 3.09.
- B. Water settling is not acceptable as a method of compaction
- C. The Contractor shall be responsible to provide the proper size and type of compaction equipment and select the proper method of utilizing said equipment to attain the required compaction density.
- D. In place compaction tests will be made. Contractor shall remove and recompact material that does not meet specified requirements.

### **3.09 FINISH ELEVATIONS**

- A. Elevations shown on Drawings are intended to achieve proper aesthetics and drainage control.
- B. Control grid and spot elevations shall be established by Contractor.
- C. Vary control grid spacing to accurately define slope, rounding of mounds, and depressions.
- D. Field staking of certain intermediate grid points at locations where slopes are uniform may, at Engineer's discretion, be eliminated.
- E. Finished surface shall be smooth, compacted, and free from irregular surface change so as to drain readily.
- F. The degree of finish shall be that ordinarily obtainable from blade grader operations, except as otherwise specified. The finished surfaces not to be paved shall be not more than 0.08 foot above or below the established grade or approved cross section, unless approved by the Engineer. All areas to be paved shall be finished as required for pavement subgrade.

### **END OF SECTION**

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## **SECTION 02 28 21**

### **HYDROSEEDING**

#### **PART 1 – GENERAL**

##### **1.01 SCOPE OF WORK**

- A. Hydroseeding shall occur on all disturbed areas as identified on the Drawings, and as determined by the Engineer. Hydroseeding shall consist of grass.
- B. The distribution of the hydroseeding types shall be as identified on the Drawings and as determined the by Engineer.

##### **1.02 PLANTING SEASON**

- A. Hydroseeding shall be done between March 15 and October 30. Actual planting shall be performed only when weather and soil conditions are suitable and in accordance with locally accepted practice and/or attempted when wind velocities would prevent uniform application or when winds would drift the material outside the areas to be seeded.
- B. The Contractor shall provide supplemental watering as necessary to maintain a moisture level at all hydroseed areas necessary for germination and establishment for a period of 30 days minimum from date of seeding.

##### **1.03 APPLICATION QUALIFICATION**

- A. Hydroseeding shall be performed by an experienced applicator.

##### **1.04 SUBMITTALS**

- A. Guaranteed analysis of seed mixes.
- B. Guaranteed analysis of fertilizer.
- C. Guaranteed analysis of soil stabilizer.

##### **1.05 GUARANTEE**

- A. The guarantee of all hydroseed areas under this Contract shall be for 1 full year from the final completion date. At the conclusion of the guarantee period, the Engineer will make inspections to determine the condition of hydroseed areas. All areas of hydroseed not in a healthy growing condition, as determined by the Engineer, shall be reseeded with seed as originally planted. Such replacement shall be made in the same manner as specified from the original plantings, and at no extra cost to the Owner. The guarantee on hydroseed areas shall be limited to one replacement. The Contractor is not responsible for vandalism.



## **PART 2 – PRODUCTS**

### **2.01 SEED MIXES**

A. Seed mix shall be certified quality and meet the following conditions:

1. Erosion Control Seed Mix:

Perennial Rye Grass 55 percent

Red Fescue 25 percent

Colonial Bentgrass 10 percent

White Dutch Clover 10 percent

Apply at 5 pounds per 1,000 square feet.

B. Analysis: A complete analysis of the seed shall be submitted by the Contractor prior to planting, including the percent of pure seed, germination, other crop seed, inert and weed, and the germination test date to the Engineer. All crop seed in excess of 1 percent must be itemized.

C. Seed Law: All seeds shall conform to the requirements of the Washington State Seed Law and, where applicable, the Federal Seed Act.

D. Noxious Weed Seed: All seed shall be free of seeds listed as primary noxious by the Washington State Seed Law. Seeds shall not contain seeds of weeds listed as secondary noxious by the Washington State Seed Law, singly or collectively in excess of the labeling tolerance specified by the Washington State Seed Law.

E. Rejection: When seeds furnished under this specification fail to meet the requirements within tolerance as provided by the Washington State Seed Law, the lot shall be rejected.

F. Preparation for Delivery: Seeds shall be packed in clean, dry, solid containers of uniform weight. Seed shall be labeled as required by law.

### **2.02 FERTILIZER**

A. Commercial fertilizer mix 10-20-20 applied at the rate of 430 pounds per acre (10 pounds per 1,000 square feet).

### **2.03 WATER**

A. Water shall be free from oil, acid, alkali, salt, and other substances harmful to growth of grass, and shall be from a source approved prior to use.

## **2.04 WOOD-CELLULOSE FIBER MULCH**

- A. Wood-cellulose fiber mulch for use with hydraulic application of grass seed and fertilizer shall consist of specially-prepared wood-cellulose fiber processed to contain no growth, no germination, inhibiting factors and dyed an appropriate color to facilitate visual metering of application of materials. Apply mulch at the rate of 2,000 pounds per acre.

## **2.05 SOIL STABILIZER**

- A. Soil stabilizer shall be capable of penetrating soil surface and binding soil particles; shall provide an adhesive to hold seed and wood-cellulose fibers together and bond them to the soil; and shall be made from naturally occurring and biodegradable materials. Apply soil stabilizer at the rate of 50 pounds per acre.

## **PART 3 – EXECUTION**

### **3.01 FINISH GRADING**

- A. Finish grade shall be flush with adjoining surfaces, and all slopes shall be even. Finished grade shall be free of all rocks and debris as specified in Section 02 80 10, "Topsoil Preparation." All areas must be graded smoothly prior to seeding, free of tire marks, ruts, swales, and ridges.

### **3.02 HYDROSEEDING**

- A. Seed shall be broadcast with approved hydraulic seeding equipment, in combination with wood-cellulose fiber mulch, soil stabilizer, and fertilizer distributed uniformly over designated areas. Half of seed shall be sown with sower moving in one direction, and the remainder with the sower moving at right angles to first sowing. Seed shall not be broadcast during windy weather. Hydroseeding operator shall remove all seed mulch in its entirety from adjoining paving, structures, and plants.

### **3.03 RESEEDING**

- A. Any areas that are bald after the first 30 days shall be replanted as specified by the Contractor at no additional cost to the Owner, during the timeframe specified herein.

**END OF SECTION**

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**SECTION 02 42 10**  
**DEMOLITION AND SALVAGE AND DEMOLITION PHOTOGRAPHS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies the demolition of structures, equipment, and selected items at the Tulalip WWTP site. Most of the items to be demolished by the Contractor are shown on the Drawings or on photographs at the end of this section and are based on information made available to the Engineer, but the actual structures, equipment, and items may differ. There may be some items, not shown on the Drawings and photographs that may need to be demolished to perform the demolition or modification work shown in the Contract Documents. It is the Contractor's responsibility to visit the site, inspecting the nature of work, noting the condition of the items to be removed and salvaged, and determining the scope and extent of the required work before submitting his Bid.
- B. The Contractor shall coordinate all demolition and modification work with the Owner and TULALIP TRIBES utilities throughout the project. The Contractor shall coordinate and reschedule demolition and modification work as required for precluding interference with operation of the facility.
- C. The WWTP will be in continuous operation throughout this project and the functions of the facilities shall not be interfered with at any time. Demolition work for this project will have to be spread throughout all phases of construction and coordinated with the sequencing limitations specified in Section 01 12 16, Work Sequence, to maintain proper operation of the existing facilities. The Contractor shall not begin demolition work until the requirements of Section 01 12 16, have been met.
- D. Perform all demolition work so there is no injury to any persons and no damage to adjacent structures or property. All demolition methods shall be in full compliance with municipal, county, state, and federal ordinances. Demolition work shall comply with the requirements of the Occupational Safety and Health Administration (OSHA).

**1.02 DESCRIPTION OF WORK**

- A. Demolition work for this project is located at the WWTP site. The Contractor shall be responsible for making himself familiar with the existing structures, utilities, and site work at this site to perform the demolition work shown on the Drawings and photographs and as required for construction.
- B. WWTP Demolition: In addition to the photographs attached to this section, demolition work at this site is shown on the Mechanical, Electrical, and Instrumentation Demolition Drawings. Work shown on the Project Drawings is based on information obtained from the Tulalip Tribes "Quil Ceda Wastewater Treatment Plant" record drawings dated May 2002, as prepared by Parametrix, Inc. The Owner will furnish one copy of these record drawings to the Contractor within 14 days after the Notice to Proceed is issued. The Contractor shall review these drawings and note any differences with existing conditions prior to performing demolition work at the WWTP.

### **1.03 SUBMITTALS**

- A. Procedures: See Section 01 33 00.
- B. The Contractor shall submit a proposed demolition/ modification schedule for review and approval by the Engineer prior to performing any work specified in this section. The schedule shall be coordinated with the construction plan and MOPO Form specified in Section 01 12 16, Work Sequence. The following items shall be indicated on this schedule:
  - 1. Detailed sequence of selective demolition, removal and modification work, with starting and ending dates for each activity to ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of utility services. Coordination for shutoff, capping, and continuation of utility services.
  - 3. Locations of any temporary partitions and means of egress.
  - 4. Coordination of Owner's continuing use of portions of existing building and of Owner's partial use of completed Work.

### **1.04 JOB CONDITIONS**

- A. Remove equipment in a manner that protects adjacent equipment and piping.
- B. If cutting of concrete is required, perform work in a manner that contains and exhausts concrete dust to a bag filter or other means of complete containment and capture.
- C. Control the amount of dust resulting from demolition to prevent the spread of dust to equipped portions of buildings and to avoid creation of a nuisance in the surrounding area. Do not use water when it will result in, or create, hazardous or objectionable conditions such as flooding and pollution.
- D. The Contractor shall repair or replace any property that is damaged while performing demolition work.
- E. Protect existing elements that are to remain. Any existing elements damaged by the Contractor shall be repaired or replaced to match the pre-damaged condition at the Contractor's expense.
- F. All obstructions shall be adequately barricaded.

### **1.05 PERMITS**

- A. Contractor shall contact the Tribes Building Department to obtain a demolition permit(s) prior to removing and demolishing piping and other permanent structures at project site(s).

## **PART 2 – PRODUCTS**

### **2.01 REPAIR AND REPLACEMENT MATERIALS**

- A. Materials used in the repair or replacement of existing work to remain that is damaged by the Contractor shall be identical or equal to the materials used in existing work when new.

## **PART 3 – EXECUTION**

### **3.01 OPERATION PROCEDURES**

- A. Start and complete work in order or precedence as established by approved schedule. Operational procedures and sequence of work is optional with Contractor provided they do not infringe upon or violate schedule.
- B. Execute work to protect Owner's staff from injury and discomfort. Provide protection to persons and property. Conduct operations to ensure minimum interference with roads, walks, entrances, exits, and other adjacent facilities.
- C. Provide the following:
  - 1. Covered passageways where necessary to ensure safe passage of persons in or near areas of work.
  - 2. Substantial barricades and safety lights as required.
  - 3. Temporary dust proof partitions where indicated or necessary to prevent infiltration of dust into equipment areas.
  - 4. Temporary weather protection as necessary to prevent damage to existing facilities and equipment areas.

### **3.02 SELECTIVE PIPE AND STRUCTURE DEMOLITION/ MODIFICATION**

- A. General: Demolish and remove existing construction only to the extent required by new construction and where indicated on the Drawings and photographs.
  - 1. Proceed with selective structural demolition systematically, from higher to lower level. Complete selective demolition operations above each level before disturbing supporting structural members on the next lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover walkway openings to remain while performing work in the area.
  - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces verify condition and contents of hidden space before starting

- flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations. Maintain adequate ventilation when using cutting torches.
4. Remove equipment, debris, and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  5. Structural Concrete: Demolish in small sections. Saw cut concrete to an appropriate depth at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.
  6. Piping: Included with demolition/ modification schedule, Submit information on how stainless steel pipe cutting de-burring and cleaning will be done. Support pipes and connected equipment during all demo and modifications.. Cap all operation pipe after portions are removed or modified in accordance with Contract Documents.

### **3.03 UTILITY DEMOLITION**

- A. The Contractor shall identify all existing site utilities to remain around the utility to be removed and shall coordinate with the Owner to isolate the utility service prior to performing any utility demolition work.
- B. Completely remove piping, conduit, and wiring designated to be removed. Underground piping, conduit and wiring which are to be abandoned and do not interfere with new work may be left in place, unless otherwise noted on the Drawings. Abandoning pipe in place can only be done where indicated on Drawings.
- C. Existing utilities shall be removed to the limits of the work, and abandoned as specified below:
  1. Open ends of utilities shall be closed using approved, standard closure pieces to prevent water that may accumulate in such utilities from disrupting other constructions activities.
    - a. Water and wastewater lines shall be capped with an approved sealed connection, either welded, threaded, mechanical joint or blind flange, appropriate to the type of pipe.
  2. Electrical conduit shall be cut, wires removed back to last junction scheduled to remain, with live leads fitted with wire nuts. Conduit shall be capped on both ends.
  3. All abandoned utilities will be shown on record Drawings in horizontal location, depth of bury, and method of closure.
- D. Do not leave abandoned branches of piping and wiring "live." Isolate abandoned piping branches by disconnecting the branch at the piping main. Plug, cap, and seal active branch at isolating valve or point of disconnection.

### **3.04 EQUIPMENT DEMOLITION**

- A. Completely remove equipment, which is designated to be removed, including all associated devices, supports, piping, controls, conduit, wiring, etc.
- B. Completely remove concrete equipment bases if the existing bases are not to be used for new equipment. Fill in and trowel smooth all disturbed concrete surfaces to remain with concrete filler, Cast-In-Place Concrete. Grind smooth all anchor bolts and rebars flush with the floor slab and coat in accordance with specifications.

### **3.05 CUTTING AND REMOVAL**

- A. Neatly cut and remove materials, and prepare openings to receive new work.
- B. Saw cut the perimeter of pavement and sidewalk surfaces that abut surfaces to remain.
- C. Provide shoring, bracing, and other supports to prevent movement, settlement, or collapse of remaining or adjacent wall areas, structure, or facilities. Arrange shoring, bracing, and supports to prevent overloading of structure.
- D. Take precautions necessary to prevent damage to existing remaining work or to adjacent facilities. Execute work using methods that will prevent interference with use of remaining and adjacent facilities by the County.
- E. Properly disconnect and remove salvaged items to retain their full salvage value.

### **3.06 FILLING**

- A. Backfill and compact all excavations resulting from demolition work. Excavations from demolished structures, or piping shall not be filled with any materials subject to deterioration. Voids in excavations are not permitted.
- B. Backfill excavations, which will not be beneath new structures, buildings, piping, or other new work as specified in this paragraph.
- C. Backfill excavations more than 3 feet deep or more than 5 cubic yards in volume as specified in the WSDOT Standard Specifications.
- D. Place and compact backfill in other site excavations to produce an adequate foundation for grassing.
- E. Any disturbed adjacent surfaces shall be backfilled, restored and graded to match existing grade and surface drainage pattern.

### **3.07 CLEANUP**

- A. Contractor shall coordinate with Owner regarding whether the Owner wants to keep some of the demo material or equipment. For all other materials removed by demolition including piping, equipment, metals, concrete, structures, and miscellaneous items shall become the property of the Contractor.
- B. Remove demolition debris, rubbish, temporary facilities, and equipment from the work site and dispose of in accordance with all local laws, codes, and ordinances at the Contractor's expense.



- C. Do not allow debris and rubbish to accumulate on the sites. Remove debris and rubbish from the sites on a regular basis to the satisfaction of the Owner.
- D. Level surface irregularities to eliminate depressions. Leave the work in a neat and presentable condition.

**END OF SECTION**

**(Photos follow)**



NOTES:

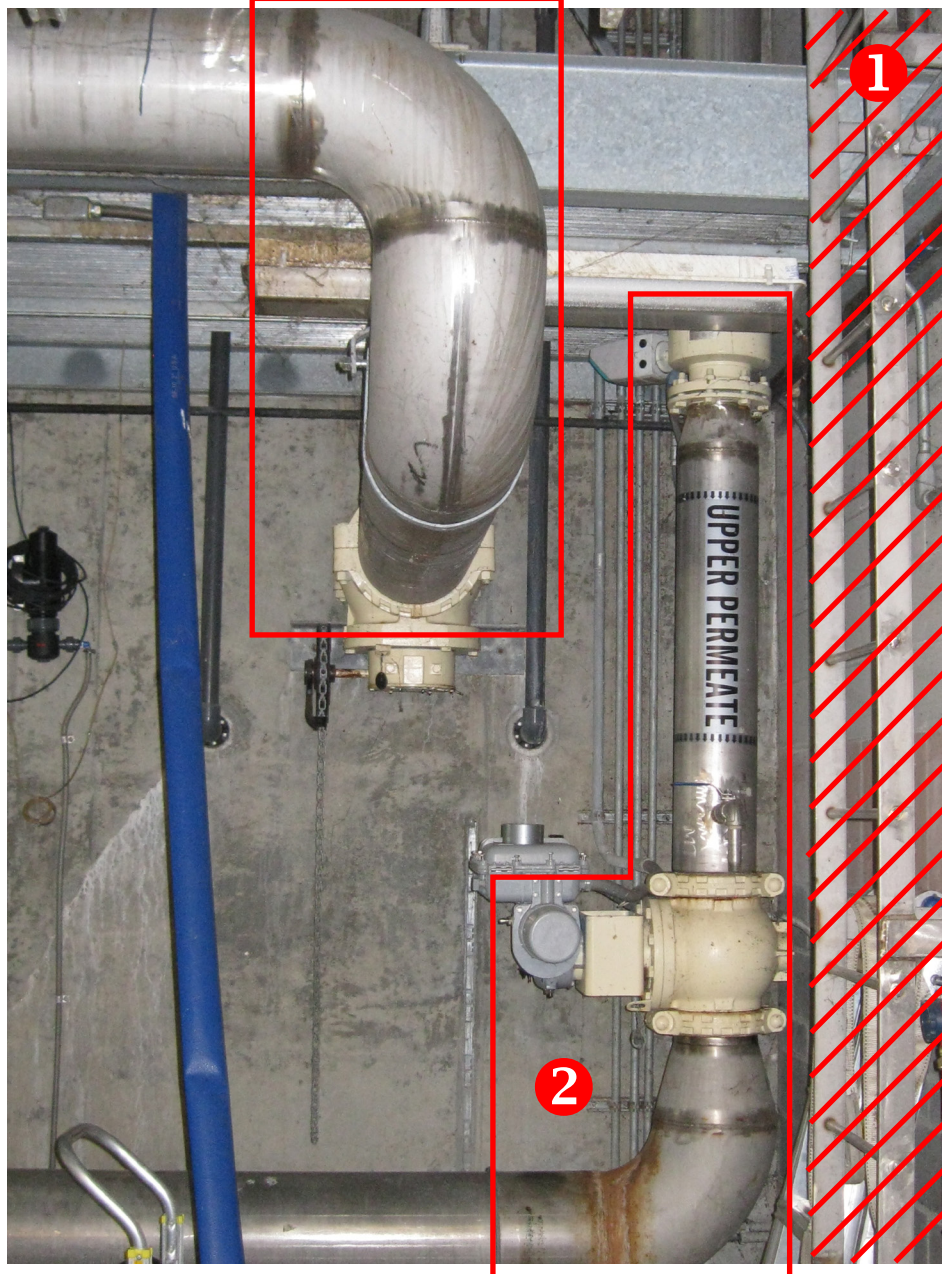
Replace existing grating and supports. Replace with new grating and supports to limits shown on structural drawings.



NOTES:

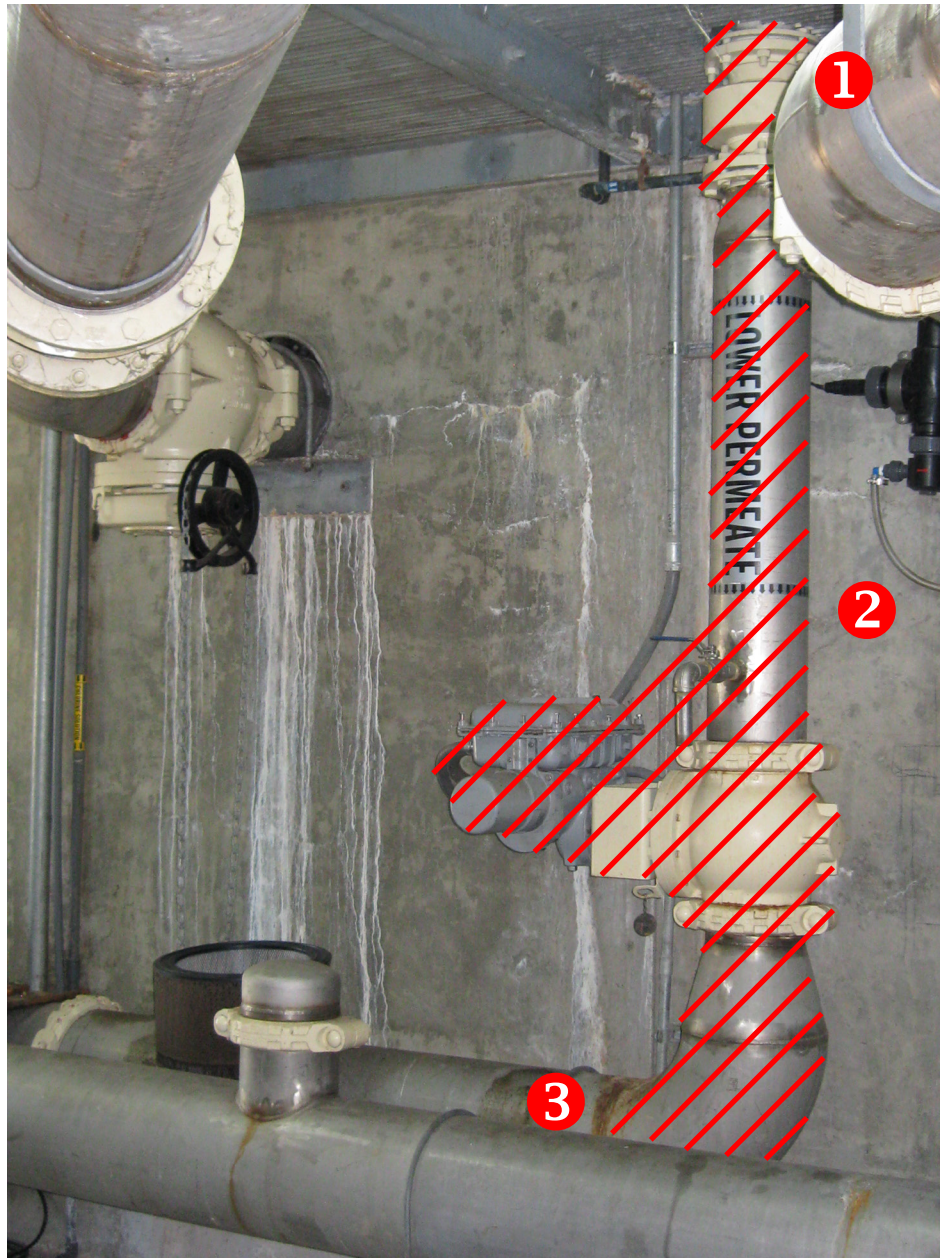
Replace motorized roll up door with double steel door as shown on structural.





NOTES:

1. Demo ladder and supports. Remove vertical elbow and lower 12" REC pipe and move 8" PERM pipe to locations shown on mechanical drawings.
2. Valve and operator to be given to owner.



NOTES:

1. Flow meter remove to give to owner.
2. Give valve and operator to owner. Remove vertical 8" pipe and 90° elbow.
3. Connect 12" horizontal PERM to new MBR4 vertical 8" PEPM.

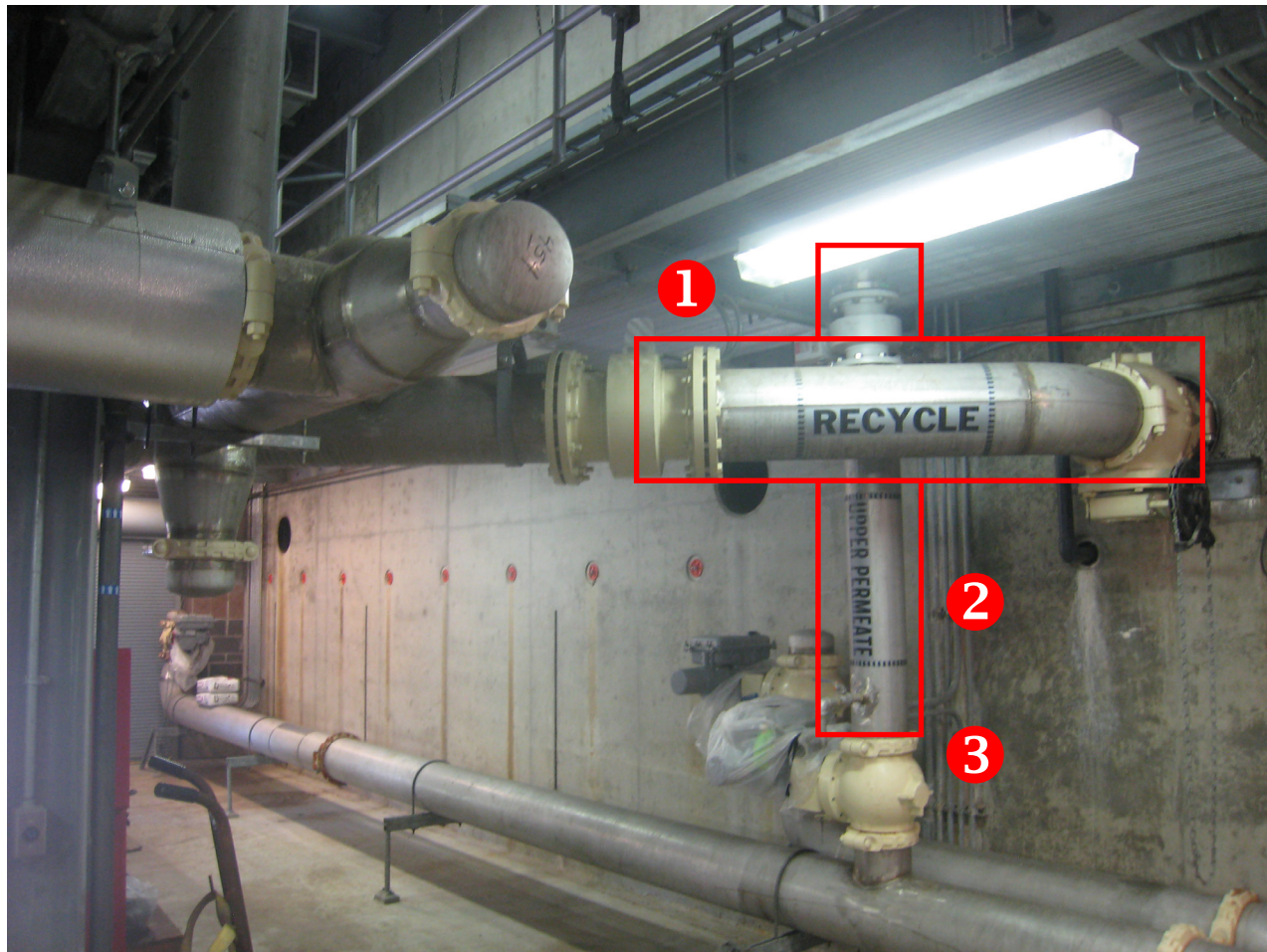




NOTES:

MBR1

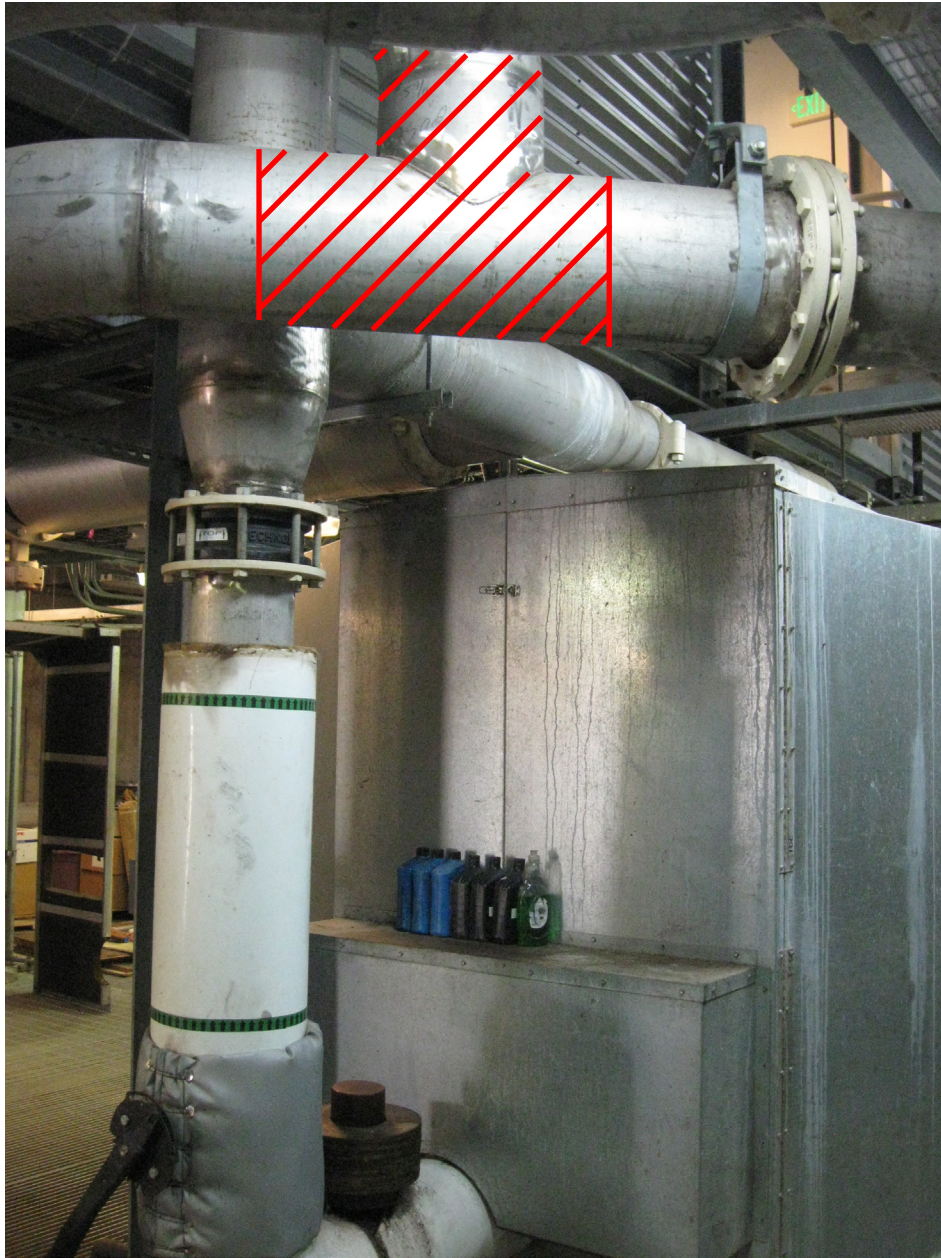
Remove valve and operator and give to owner. (Also at 4 other locations.) Remove 12" PERM pipe and replace with 8" and 6" PERM pipes per mechanical drawings.



NOTES:

1. Cut and move 12" REC pipe to new wall opening. Per mechanical drawings.
2. Remove 8" PERM, connect to new MBR3 8" PERM pump suction pipe at floor level and mezzanine, and cap existing below valve.
3. Give valve and operator to owner.





NOTES:

Remove vertical tee (2 places) on 12" REC and replace with 12" WYE. See mechanical drawings.





NOTES:

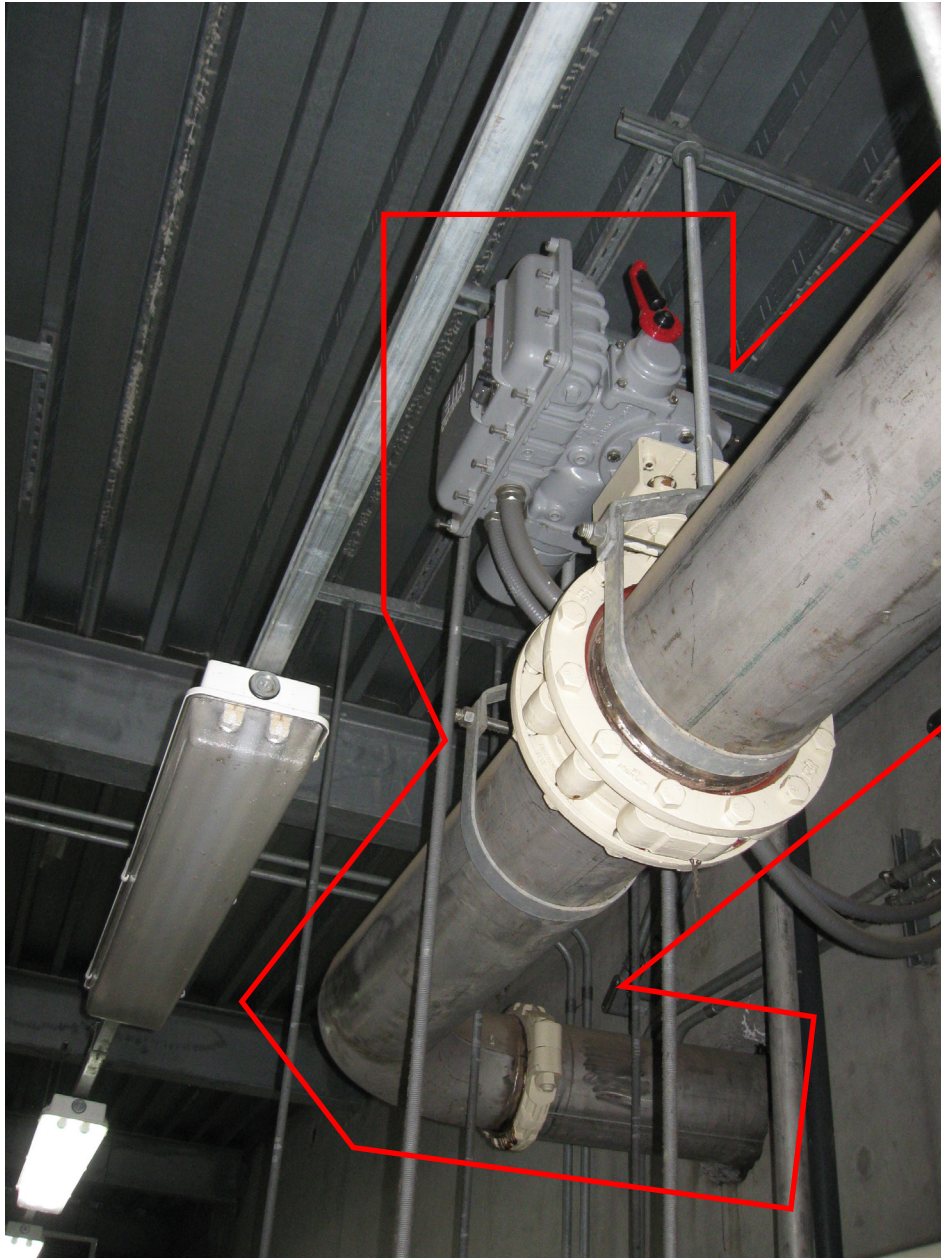
Lower existing 12" MBR1 pipes to MBR2 and MBR3 from  $\text{CL}$  elev 8.5 to  $\text{CL}$  elev 7.5.  
Existing 45° bends to be rotated per mechanical drawings.



NOTES:

Remove existing 8" PERM. Give valve and operator to owner. Cap existing 8" PERM at mezzanine level and ground floor.





NOTES:

Move existing 10" PA as shown on mechanical. At MBRs 2 and 3.





NOTES:

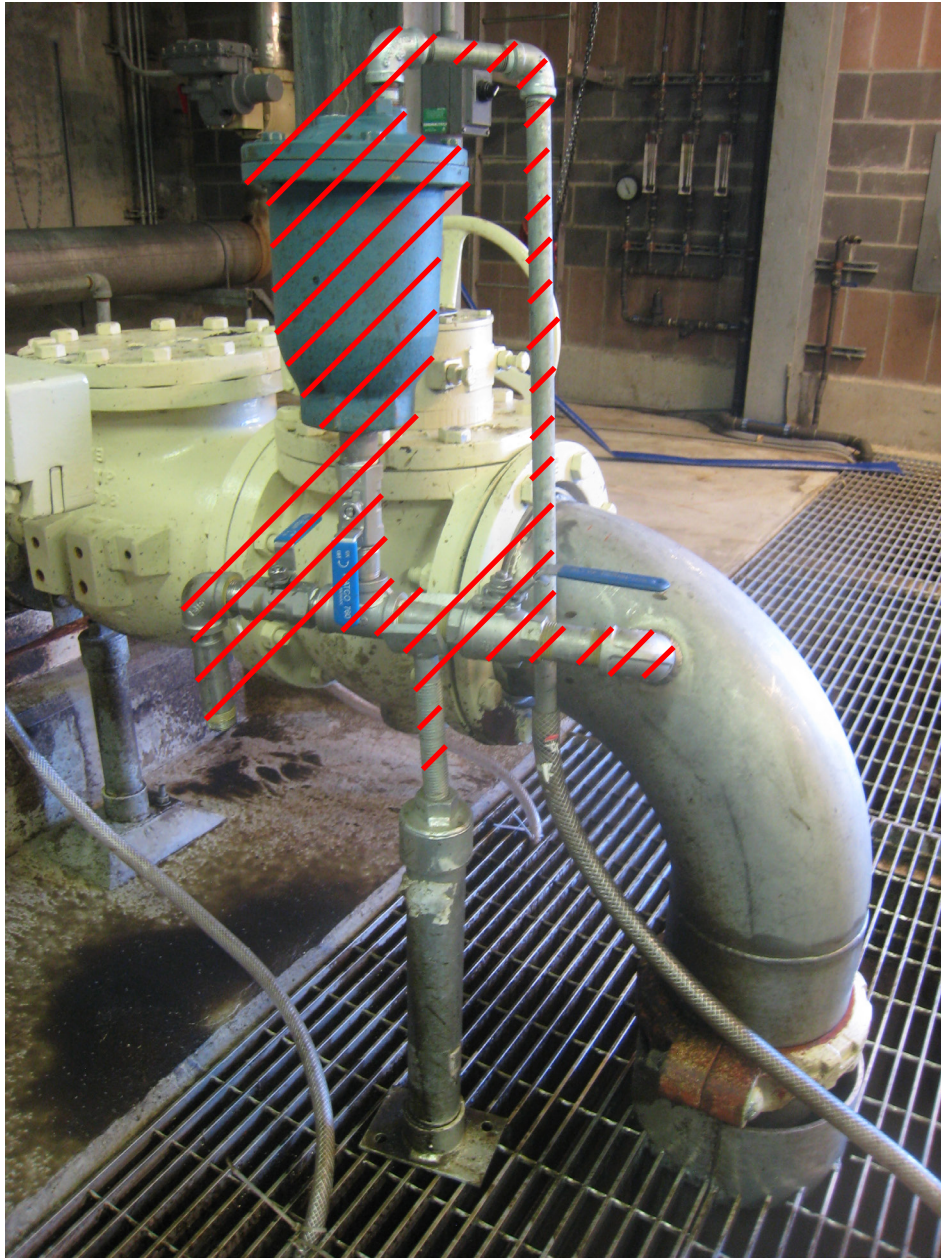
Move SST 10" PA to south end of MBR tank per mechanical drawings. Install cap on 10" PA where cut.



NOTES:

Remove existing 2" PVC vent piping MBR2 REC pipe. Cap pipe at 12" REC pipe.

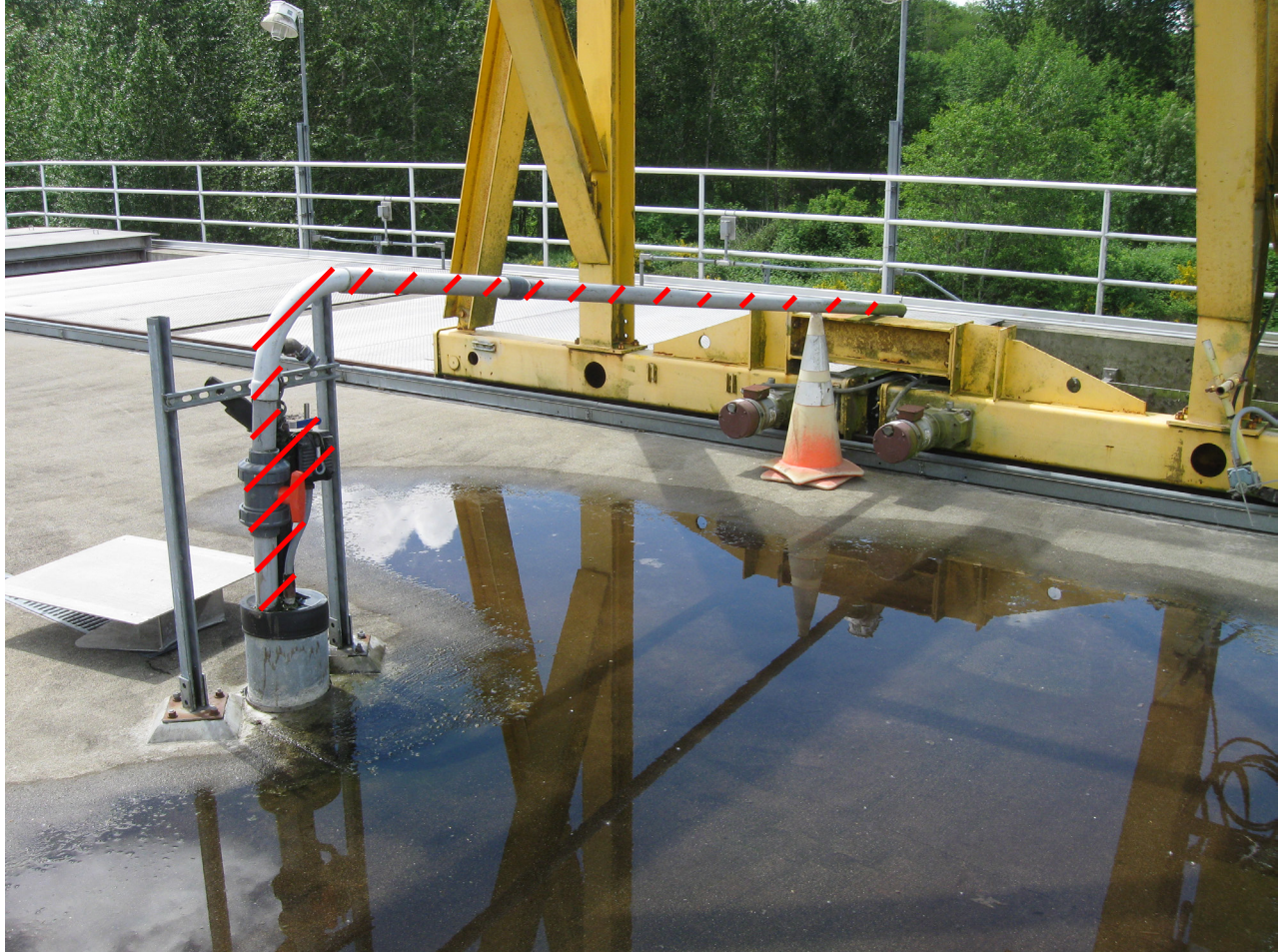




NOTES:

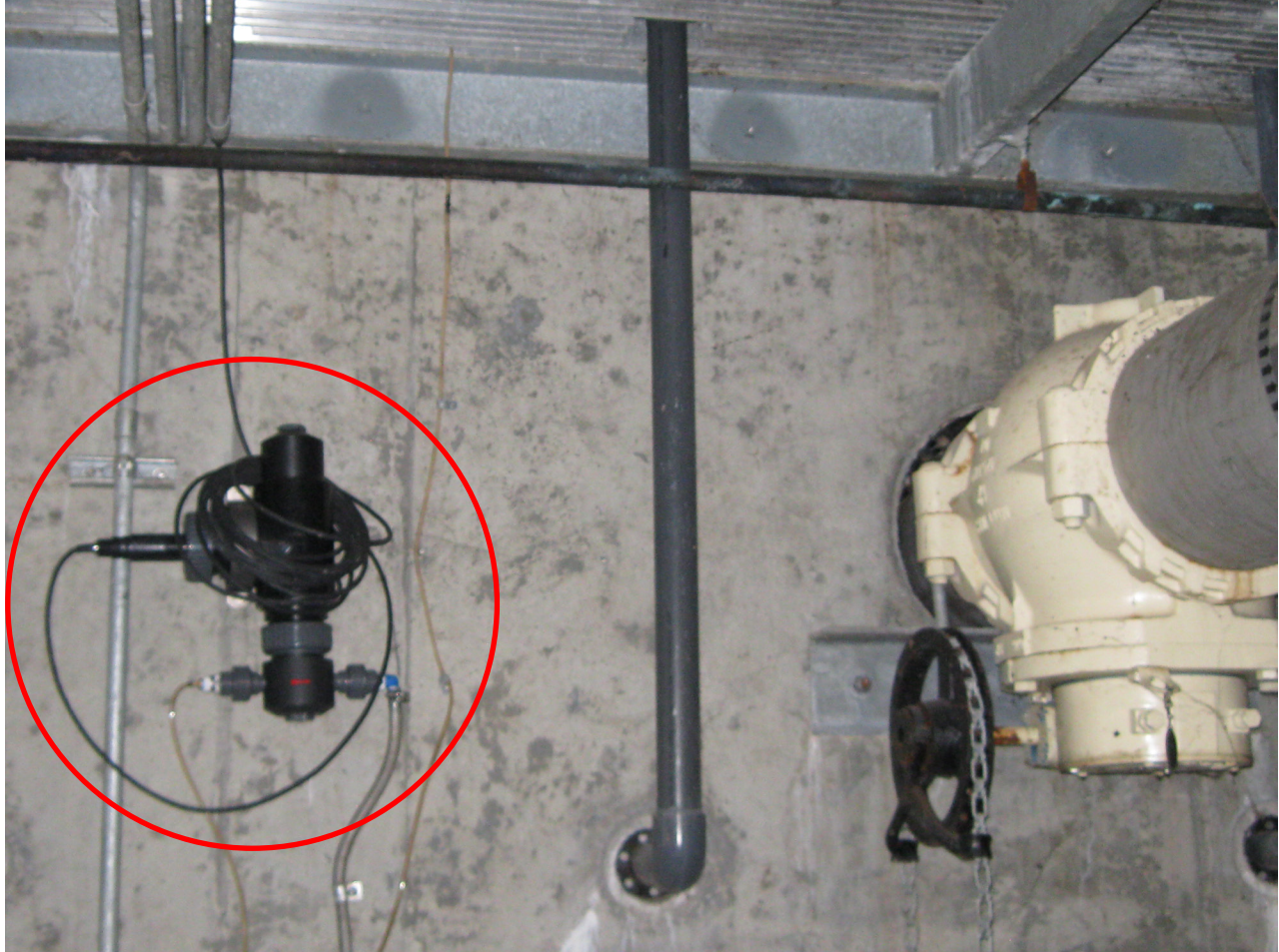
Remove air relief valve (at 3 REC pumps) and associated piping. Plug at 8" REC pipe.  
Pipe stand can be salvaged for roof vent pipe.





NOTES:

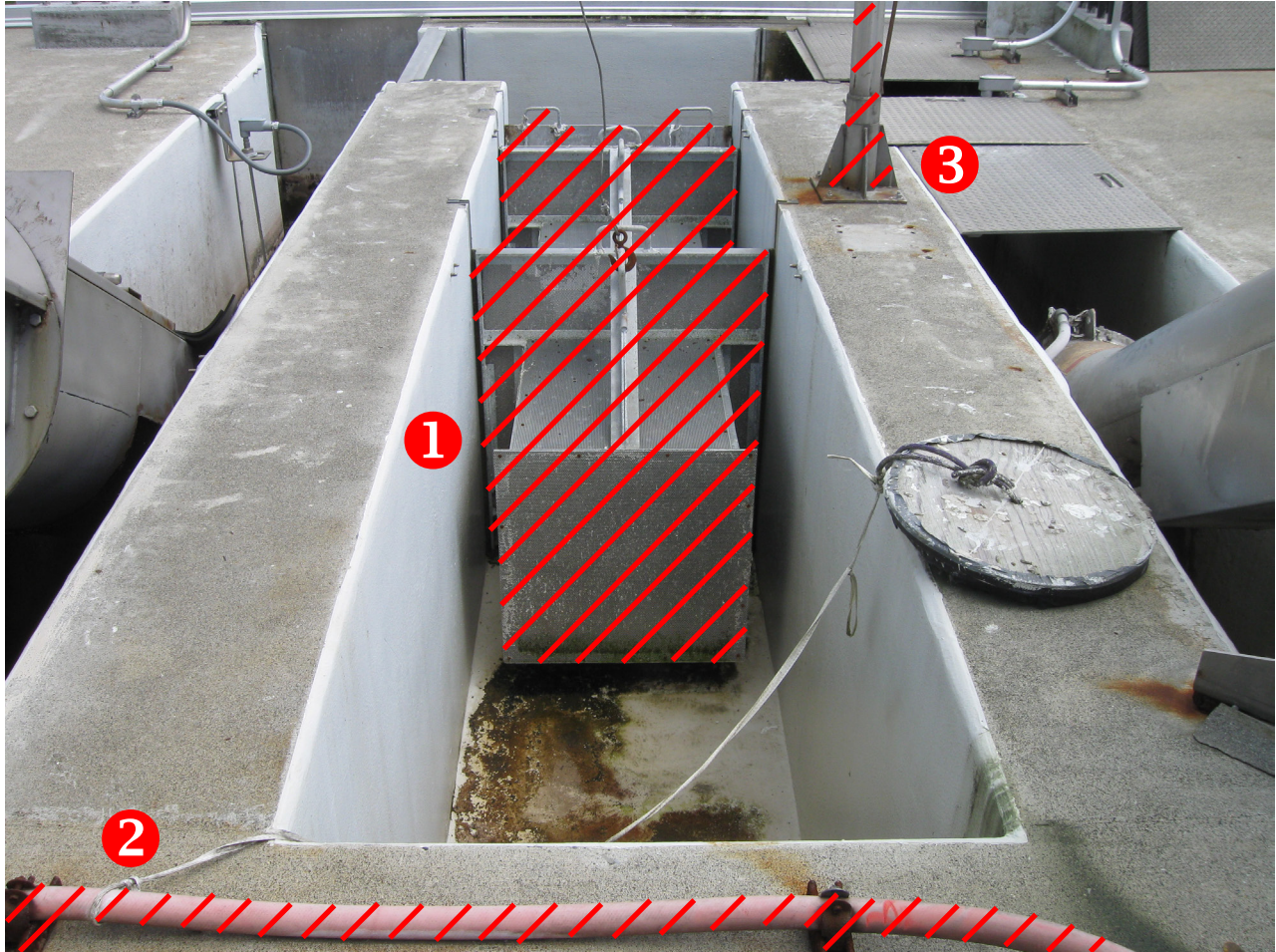
Remove existing PVC vent pipe at MBR2.



NOTES:

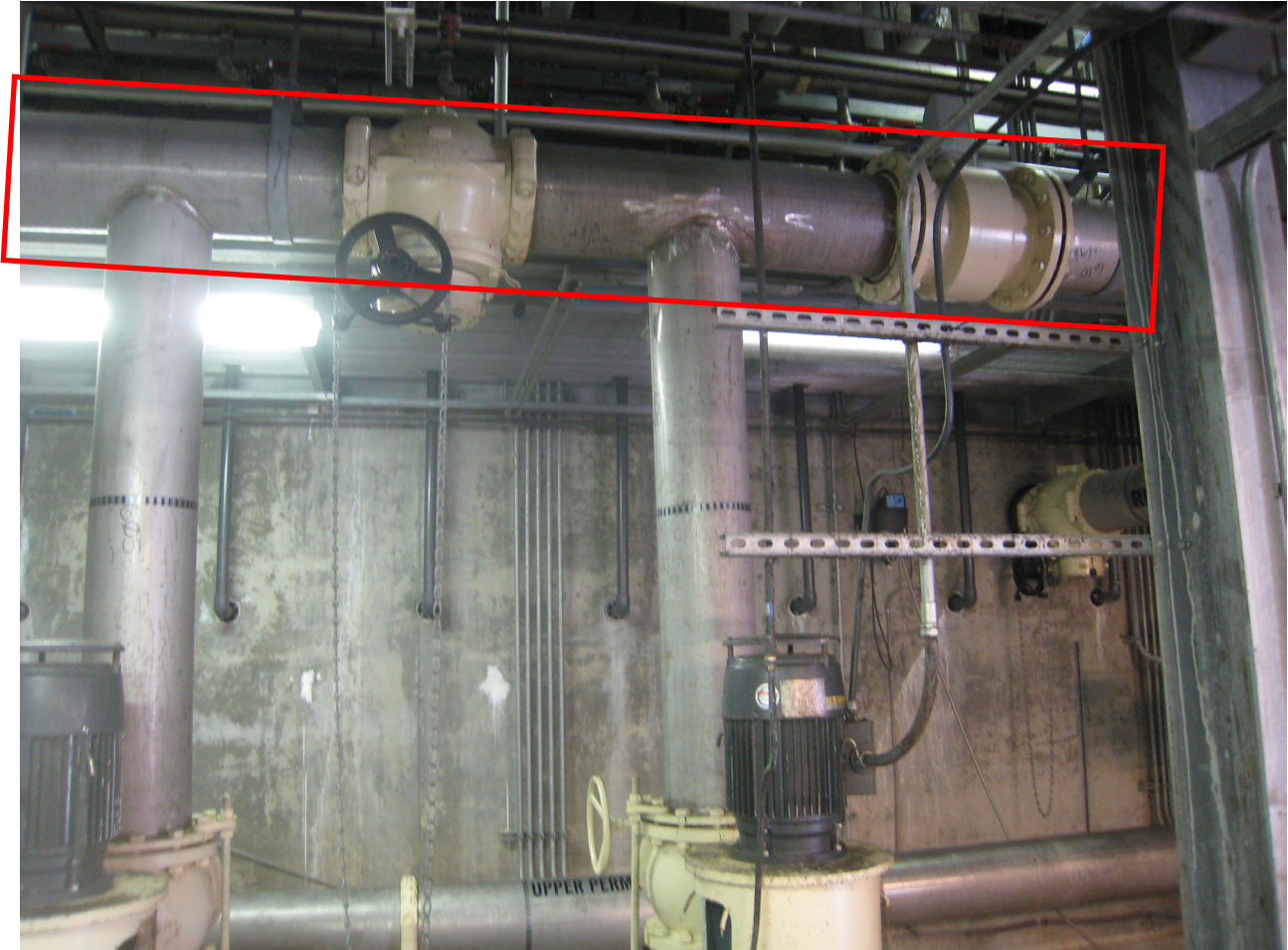
Move south turbidity meters from MBR2 and 3 to new location approximately 22' north to north end of the same 8" PERM pipe.





NOTES:

1. Remove manual screen boxes.
2. Remove existing rubber water hose. Replace with stainless or aluminum water pipe.
3. Remove hoist. Replace with stainless davit crane (see specs).



NOTES:

Cut horizontal 12" REC pump suction header and lower per mechanical drawings to  $\text{CL}$  elevation 8.75.



**SECTION 02 53 00**  
**DEWATERING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Scope: This section covers the work that may be necessary to lower the groundwater, pump standing water from trench excavations, and control surface runoff water to maintain all excavations dry, prevent slope instability, and to prevent disturbance of materials in the bottom of excavations. This section also includes the protection of adjacent structures and facilities from damage caused by dewatering operations.

**1.02 QUALITY CONTROL**

- A. The design, installation, and operation of the dewatering system shall be the Contractor's responsibility. The selection of the dewatering methods used is the Contractor's option. The methods may consist of sump pumps, deep wells, well points, collection trenches, cutoff walls, all or part of the above methods, or other methods as deemed necessary by the Contractor and as necessary to achieve the specified results.
- B. The Contractor shall construct, maintain, and operate all cofferdams, channels, flume drain, sumps, pumps, and/or other temporary diversion and protection works; shall furnish all materials required therefore; and shall furnish, install, maintain and operate all necessary pumping, emergency generator, and other equipment for the environmentally safe removal and disposal of water from the various parts of the work and for maintaining the foundations and other parts of the work free from water.
- C. The Contractor shall be responsible for all excavations to prevent the occurrence of surface water inflows, boils, seepage, loss of fines, quick condition, loosening or otherwise disturbing the foundation strata, slope instability, and bottom heave. The minimum requirements for dewatering systems shall be as stated herein.
- D. The Contractor shall use a registered civil Engineer or Geologist licensed in the State of Washington with a minimum of 5 years of experience in the design of dewatering systems to design the system and provide other assistance during installation and operation, as necessary.

**1.03 SUBMITTALS**

- A. At least 15 days prior to the initiation of any dewatering, the Contractor shall submit the complete Plans and description of the dewatering method proposed for use to the Engineer for review.
- B. Submit a complete description of the dewatering method, including the design concept, installation procedures, the Contractor's proposed method of monitoring the system's adequacy, and proposed approaches to modifying the system, if necessary, in order to satisfy the dewatering requirements as specified herein.

- C. Review by the Engineer of the Contractor's dewatering submittal will only be with respect to the basic principles of the methods the Contractor intends to employ. Acceptance by the Engineer of the dewatering system will be based on the demonstrated performance of the system to satisfy the requirements of dewatering as specified herein. The Engineer's review shall not in any way be considered to relieve the Contractor from full responsibility for errors therein or from the entire responsibility for complete and adequate design and performance of the system to achieve the specified results. The Contractor shall be solely responsible for proper design, installation, operation, maintenance, and any failure of any component of the dewatering system and any damages resulting therefrom.
- D. Submittals shall be in accordance with Section 01 33 00.

## **PART 2 – PRODUCTS**

### **2.01 EQUIPMENT**

- A. Before operations begin, the Contractor shall have available on the site of work, sufficient pumping equipment and/or other machinery to assure that the operation of the dewatering system can be maintained.

## **PART 3 – EXECUTION**

### **3.01 CONTROL OF GROUNDWATER**

- A. It is the intent of these Specifications that an adequate dewatering system be installed to lower and control the groundwater in order to permit excavation; the placement of bedding, backfill, and fill materials; and construction of facilities to be performed under dewatered conditions.
- B. Dewatering for excavation shall be done by such method as the Contractor may elect. Dewatering sufficient to maintain the groundwater level a minimum of 3 feet below the surface of trench bottom, base of the bedding course, or other foundation shall be accomplished prior to pipe laying and jointing or placement of reinforcing steel for concrete. The dewatering operation, however accomplished, shall be carried out so that it does not destroy or weaken the strength of the soil under or alongside the excavation. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sandpacked or provided with other means to prevent pumping of fine sands or silts from the subsurface. A continual check by the Contractor shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points shall be established and observed at frequent intervals to detect any settlement which may develop.
- C. Should settlement be observed, the Contractor shall cease dewatering operations and implement contingency plans as outlined in the approved dewatering Plan. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with the Contractor. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the Contractor.

- D. As part of these dewatering requirements, all excavations shall be protected from surface water inflows using ditches, flumes, dikes, surface grading, or other methods as necessary.
- E. Closed pipelines shall be used to convey pumped water from the dewatering systems and from the excavation to an approved point of discharge. The Contractor shall comply with local codes and ordinances of governing authorities with regard to disposal of water pumped from dewatered excavations.
- F. The removal of natural, in-place soils during dewatering operations shall be prevented. The system shall be such that after initial development, the quantity and size of soil particles will decrease until no visible soil particles are present in water being pumped at any time after 24 hours initial pumping.

### **3.02 DURATION OF DEWATERING**

- A. The Contractor shall keep dewatering systems in operation during excavation, construction, backfilling operations, and other construction until the project is completed or until such time as a written directive to cease operations has been received from the Engineer.

### **END OF SECTION**

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**SECTION 02 80 10**  
**TOPSOIL PREPARATION**

**PART 1 – GENERAL**

**1.01 SCOPE OF WORK**

- A. Soil preparation and placement for areas to be planted. Soil preparation shall consist of both screened, on-site topsoil, and imported manufactured topsoil.

**1.02 SUBMITTALS**

- A. Submit guaranteed analysis of fertilizer mixes.
- B. Submit sample of import topsoil.
- C. Submit sample of screened on-site topsoil.

**1.03 SEQUENCING AND SCHEDULE**

- A. Coordinate soil preparation work with installation of other site improvements.

**1.04 ENVIRONMENTAL CONDITIONS**

- A. Prepare soil only when topsoil is not in a wet or muddy condition. Take all precautions to control runoff of topsoil and fertilizers and to contain on the project site.

**1.05 HERBICIDE APPLICATION & QUALIFICATION**

- A. Applications of herbicides for weed control as may be required shall be made only by an applicator licensed under Washington State law and as approved by the Landscape Architect.

**1.06 PROTECTION**

- A. Provide protective cover and barriers as necessary to prevent damage and staining to all site improvements and off-site structures, facilities, and property.

**PART 2 – PRODUCTS**

**2.01 TOPSOIL**

- A. Topsoil shall meet WSDOT 9.14.1(3) of these Specifications, and shall be free of animal wastes or other potential groundwater contaminants.

**2.02 WATER**

- A. Shall be provided by the Owner from the Owner's water system. The Contractor shall not add any substances to the water without prior permission from the Owner.

## **PART 3 – EXECUTION**

### **3.01 INSPECTION**

- A. Examine the entire site for conditions that will adversely affect execution, permanence, and quality of work, and survival of plant materials.
- B. Contractor shall be responsible for obtaining finished grade in all hydroseed areas prior to planting. Contractor shall be responsible to clean all debris from planting beds prior to filling.

### **3.02 PREPARATION OF GROUND SURFACES**

- A. Over-excavate areas that are to receive plantings to a minimum depth of 12 inches.
- B. Remove lumber, stone, sticks, mortar, concrete, rubbish, debris, contaminated soil, and any other material harmful to plant life. This may necessitate hand raking. All rock, stone, debris, etc., over 1 inch in size shall be removed.
- C. Weed Eradication and Control:
  - 1. Mechanically remove noxious weed growth and roots, including, but not limited to, Johnson grass, quackgrass, morning glory, nutgrass, rushgrass, Canadian thistle, poison oak, poison ivy, and Himalayan blackberry. Contractor shall not use herbicides.
  - 2. Remove all existing plants and vegetation not shown to remain on Plans. Dispose off-site.

### **3.03 PREPARATION OF PLANTING AREAS**

- A. Topsoil mix depth in planted areas shall be a minimum of 12 inches of imported, manufactured topsoil. Topsoil must be flush with adjoining surfaces prior to planting.

### **3.04 FINE FINISH GRADES**

- A. Establish fine finish grades with even slopes between elevations indicated on Drawings. Previously established grades shall be maintained on the areas to be treated in a true and even condition; necessary repairs shall be made to previously graded areas. Where grades have not been established, the areas shall be graded as shown and all surfaces shall be left in an even and properly compacted condition to prevent formation of depressions. Finished grade shall be such that after subsequent treatment, i.e., planting and bark-mulch application, the planted grade will be 1/2 inch below adjoining surfaces; such as, walks, steps, drives, parking lots and extruded concrete curbs, and raised planting bed walls.

### **3.05 CLEANUP**

- A. Keep project site reasonably free from accumulation of debris, topsoil, soil amendments, and other materials.
- B. Remove topsoil from cement, concrete, and asphalt paving on a daily basis.



- C. Maintain pavement in a clean condition by sweeping, raking, vacuuming, and/or hosing down. This material shall be removed from the site or placed into the plant bed if appropriate.
- D. At completion of each area of work, remove debris, equipment, and surplus materials.

**END OF SECTION**

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## Division 03

### Concrete



**SECTION 03 15 19**  
**ANCHORS, INSERTS, AND EMBEDDED PRODUCTS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies the materials and installation requirements for metal embedment into concrete or grouted masonry.
- B. Items Included:
  - 1. Cast-in-place anchor bolts (anchor rods).
  - 2. Manufactured cast-in-place inserts for suspended piping or electrical items.
  - 3. Inserts for structural attachments.
  - 4. Collars or sleeves for pipe penetrations.
  - 5. Post-installed anchors.

**1.02 SUBMITTALS**

- A. Shop Drawings for all anchors, inserts, and embedded products (wall castings, pipes with seep rings, and special castings or fabrications).
- B. Manufacturer's Data: Submit complete data including dimensions, resins, colors, and other information.
- C. Current ICBO Evaluation Reports for all expansion and adhesive anchors.

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. Anchor Bolts: ASTM F1554 Grade 36 or ASTM A307, galvanized steel unless otherwise noted. Configuration shall be as shown or noted on the Drawings.
- B. Threaded or Slotted Inserts: Galvanized malleable iron or stainless steel, size and type as specified or noted elsewhere.
- C. Expansion Anchors: ICBO approved for use in cracked and uncracked concrete for all anchors used for wind or seismic anchorage applications.
  - 1. Stainless Steel:
    - a. Stud: Stainless steel bar conforming to ASTM A276 with chemical composition of either AISI 304 or 316.

- b. Wedge: Manufactured from either AISI 304 or 316 stainless steel.
  - c. Nut: Stainless steel conforming to ASTM F594 with chemical composition of either AISI 304 or 316 and meeting dimensional requirements of ANSI B18.2.2.
  - d. Washer: AISI 304 or 316 stainless steel conforming to ASTM A240.
2. Products:
- a. Hilti, Kwik-Bolt TZ.
  - b. Powers Fasteners, Power-Stud +.
  - c. Simpson Strong Tie, Strong-Bolt 2.
  - d. Other manufacturers upon approval of Engineer.
- D. Adhesive Anchors:
- 1. Anchor rod material shall conform to ASTM A304 stainless steel unless ASTM A316 is called out on the Drawings.
  - 2. Products:
    - a. Hilti, HIT-RE 500-V3.
    - b. Powers Fasteners, PE1000+.
    - c. Simpson Strong-Tie, SET-XP.
    - d. Other manufacturers upon approval of Engineer.
- E. Anchors into Masonry:
- 1. All anchors in CMU walls shall be adhesive type anchors. Wing type hollow wall anchors shall not be permitted.
  - 2. Provide anchors conforming to Section D above, with manufacturer's supplied screen insert for installation into masonry.
- F. Stainless Steel Plates and Shapes: Conform to AISI Type 304 unless otherwise noted.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. Coordinate the location and placement of all items to be embedded in concrete.
- B. Coat any embedded aluminum with asphalt paint.

- C. Adhesive and expansion anchors to be installed in holes drilled with carbide tipped drill bits. Anchors shall be installed per manufacturer's recommendations. Insert and tighten bolts in accordance with manufacturer's installation instructions. In case of interference with reinforcing bars or steel objects, notify the Engineer.

### **3.02 EMBEDDING**

- A. Set accurately and hold in position all embedded products during placement until the concrete is set.

### **3.03 INSPECTION**

- A. Anchors shall be inspected by Special Inspector as required by the Inspection Requirements described in the Structural General Notes contained on the Drawings or as required by the Building Official.

**END OF SECTION**

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**SECTION 03 30 53**  
**MISCELLANEOUS CAST-IN-PLACE CONCRETE**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies cast-in-place reinforced concrete, including embedded material and formwork.

**1.02 QUALITY ASSURANCE**

- A. Referenced Standards: This section incorporates by reference the latest revision of the following document. It is a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

| Reference | Title                                                                             |
|-----------|-----------------------------------------------------------------------------------|
| ACI 301   | Specifications for Structural Concrete for Buildings                              |
| ACI 318   | Building Code Requirements for Reinforced Concrete                                |
| ASTM A615 | Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement |
| ASTM C33  | Specification for Concrete Aggregates                                             |
| ASTM C94  | Specification for Ready-Mixed Concrete                                            |
| ASTM C150 | Specification for Portland Cement                                                 |

**1.03 TESTING:**

- A. No testing shall be required for this project. Concrete shall be visually inspected by Owner's Representative.

**1.04 SUBMITTALS**

- A. Concrete-Mix Product Information.
- B. Epoxy Grout and Patch Materials Information.

**1.05 CONCRETE MIX DESIGNS**

- A. Compressive Strengths: Unless otherwise specified, provide the following as minimum:
  - 1. Concrete Piers and Slabs: 3,000 psi.



## **PART 2 – PRODUCTS**

### **2.01 REINFORCEMENT**

- A. Comply with the following as minimums:
  - 1. Bars – ASTM A615, grade 60, unless otherwise shown, using deformed bars for Number 3 and larger.
- B. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI.

### **2.02 CONCRETE**

- A. Minimum Requirements:
  - 1. Portland Cement: ASTM C150, Type I or II, low-alkali.
  - 2. Aggregate, 3/8-inch maximum, pea gravel mix. Site mixed bagged product is acceptable for this project.
  - 3. Water: clean and potable.

### **2.03 OTHER MATERIALS**

- A. Bonding agent shall be a two-component, 100 percent solids compound suitable for use on dry or damp surfaces. Products shall be by Master Builders (BASF), Sika, EUCO, or approved equal.
- B. Epoxy grout and patch materials shall be two-component, 100 percent solids materials, extended with sand or gravel per manufacturer's recommendations. Products shall be by Master Builders (BASF), Sika, EUCO, or approved equal.
- C. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor.

## **PART 3 – EXECUTION**

### **3.01 EXISTING CONDITIONS**

- A. Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### **3.02 EMBEDDED ITEMS**

- A. Do not embed piping or electrical conduit in structural concrete unless indicated on the Figures or approved by the Owner's Project Representative.
- B. Set and secure bolts, inserts, and other required items in the precise locations needed so they are not displaced.

### **3.03 FORMS**

- A. Design, erect, support, brace, and maintain formwork to safely support vertical and lateral loads which will be applied until such loads can be supported safely by the concrete structure.
- B. Construct forms to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.

### **3.04 MIXING CONCRETE**

- A. Site mix the concrete product in accordance with the manufacturer's recommendations.
- B. Do not use concrete that has stood for over 60 minutes after water is first introduced into the mix.

### **3.05 PLACING CONCRETE**

- A. Preparation:
  - 1. Remove foreign matter accumulated in the forms.
  - 2. Rigidly close openings left in the formwork.
  - 3. Wet wood forms sufficiently to tighten up cracks; wet other material sufficiently to maintain workability of the concrete.
  - 4. Use only clean tools.
- B. Placing Concrete in Forms:
  - 1. Deposit concrete in horizontal layers not deeper than 24 inches, and avoid inclined construction joints.
  - 2. Remove temporary spreaders in forms when concrete has reached the elevation of the spreaders.
- C. Placing Concrete Slabs:
  - 1. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
  - 2. Bring slab surfaces to the correct level with a straightedge, and then strike off.
  - 3. Use bullfloats or darbies to smooth the surface, leaving the surface free from bumps and hollows.
  - 4. Do not sprinkle water on the plastic surface.
  - 5. Do not disturb the slab surface prior to start of finishing operations.

### **3.06 CONSOLIDATION**

- A. Consolidate each layer of concrete while placing by use of internal concrete vibrators and supplemented by hand spading, rodding, or tamping.
- B. Do not vibrate forms or reinforcement.

### **3.07 CONCRETE FINISHING**

- A. Unless otherwise indicated, provide the following finishes at the indicated locations.
  - 1. Non-slip broom finish: apply to slabs, walks, stairs, drives, ramps, and similar pedestrian and vehicular areas.
  - 2. Formed surfaces: repair all rock pockets, voids, air bubbles, etc. greater than 1/2 inch in any dimension.

**END OF SECTION**

## SECTION 03 60 00 GROUTING

### PART 1 – GENERAL

#### 1.01 SUMMARY

- A. This section specifies non shrink grout and epoxy grout for use in applications including but not limited to grouts for setting machine bases, and grouting under base plates. Epoxy adhesives for concrete applications including, but not limited to pressure injection of cracks and doweling of anchor bolts, threaded rod anchors and reinforcing bar dowels.

#### 1.02 QUALITY CONTROL

- A. Referenced Standards: This section incorporates by reference the latest revision of the following documents. These references are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

| <u>Reference</u> | <u>Title</u>                                                                                                   |
|------------------|----------------------------------------------------------------------------------------------------------------|
| ASTM C33         | Concrete Aggregates                                                                                            |
| ASTM C40         | Test Method for Organic Impurities in Fine Aggregates for Concrete                                             |
| ASTM C88         | Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate                          |
| ASTM C117        | Test Method for Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing                            |
| ASTM C136        | Test Method for Sieve Analysis of Fine and Course Aggregates                                                   |
| ASTM C150        | Portland Cement                                                                                                |
| ASTM C289        | Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)                             |
| ASTM C494        | Standard Specification for Chemical Admixtures for Concrete                                                    |
| ASTM C881        | Standard for Epoxy-Resin-Base Bonding Systems for Concrete                                                     |
| ASTM C1017       | Chemical Admixtures for Use in Producing Flowing Concrete                                                      |
| ASTM C1107       | Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).                                   |
| ASTM D2419       | Test Method for Sand Equivalent Value of Soils and Fine Aggregate                                              |
| ASTM E329        | Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction |
| CRD-C-621        | Corps of Engineers Specification for Non-shrink Grout                                                          |

#### 1.03 SUBMITTALS

- A. Procedures: Section 01 33 00.
1. Manufacturer's Data for the following:
    - a. Non-shrink cementitious grout.
    - b. Epoxy grout.

- c. Admixtures for cement grout.
- d. Adhesive for pressure injection of cracks.
- e. Adhesive for doweling.
- f. Bonding compounds.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL**

- A. Grout mixes and admixtures shall not contain more than 0.05 percent chloride ions.
- B. Water for washing aggregate, for mixing, and for curing:
  - 1. Shall be free from oil and deleterious amounts of acids, alkalis, and organic materials
  - 2. Shall not contain more than 1,000 mg/L of chlorides as Cl, nor more than 1,300 mg/L of sulfates as SO<sub>4</sub>.
  - 3. Shall not contain an amount of impurities that may cause a change of more than 25 percent in the setting time of the cement nor a reduction of more than 5 percent in the compressive strength of the grout at 14 days when compared with the result obtained with distilled water.
  - 4. Water used for curing shall not contain an amount of impurities sufficient to discolor the grout.

### **2.02 GROUT**

- A. Use grout specified on the contract Drawings or as specified in the equipment recommendations.
- B. Non-shrink cementitious grout:
  - 1. Cementitious grout that conforms to ASTM C1107, CRD-C-621, “Corps of Engineers Specification for Non-Shrink Grout”, and the following requirements:
    - a. Non-metallic aggregate.
    - b. Acceptable manufacturers:
      - 1) Euclid Chemical Co., “Euco NS.”
      - 2) BASF, “Masterflow 713 Plus.”
      - 3) Five Star Grout Co., “Five-Star Grout.”
      - 4) Or approved equal.

C. Epoxy Grout:

1. Multi-component, 100 percent solids compound conforming to the following requirements:
  - a. Suitable for use on dry or damp surfaces.
  - b. Comply with ASTM C881.
  - c. Acceptable manufacturer:
    - 1) Euclid Chemical Co., "DuralBond."
    - 2) Sika Chemical Co, "Sikadur 35 Hi-Mod LV."
    - 3) BASF, "SCB Concrecive 1380."
    - 4) Or approved equal.

**2.03 ADHESIVES**

A. Adhesive for pressure injection of cracks in concrete:

1. A two-component, moisture tolerant, low viscosity, liquid epoxy adhesive conforming to ASTM C881 for load-bearing applications.
2. Acceptable manufacturers:
  - a. BASF, "SCB Concrecive 1350 or 1360.
  - b. Sika Chemical Co, "Sikadur 35 Hi-Mod LV."
  - c. Euclid Chemical Co., "Eucopoxy Injection Resin."
  - d. Or approved equal.

B. Adhesive for doweling of anchors and reinforcing bars in concrete:

1. A two-component, moisture tolerant, epoxy gel conforming to ASTM C881 for load-bearing applications.
2. Acceptable manufacturers:
  - a. Euclid Chemical Co., "Euco #452."
  - b. Sika Corporation, "Sikadur Anchor Fix-4."
  - c. Simpson Strong Tie, "Set XP."
  - d. Hilti, "HIT RE 500SD."

- e. BASF, "SCB Concrecive 1380."
- f. Or approved equal.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. Mix, place and cure in accordance with the manufacturer's instructions.
- B. For grouting of equipment base plates, refer to manufacturer's instructions for appropriate procedures.

### **3.02 EXAMINATION**

- A. Inspect concrete surfaces to receive grout or mortar and verify that they are free of ice, frost, dirt, grease, oil, curing compounds, paints, impregnations, and all loose material or foreign matter likely to affect the bond or performance of grout or mortar.
- B. Inspect base plate and anchor systems for rust, oil, and other deleterious substances that may affect the bond or performance of grout.
- C. Confirm that newly placed concrete has been cured sufficiently to attain its design strength and limit further shrinkage.
- D. Verify that temperature of cementitious or epoxy grout does not exceed manufacturer's recommendations.

### **3.03 PREPARATION**

- A. Surface Preparation:
  - 1. Roughen all concrete surfaces by chipping, or other mechanical means to assure bond. Loose or broken concrete shall be removed.
  - 2. All grease, oil, dirt, curing compounds, laitance, and other deleterious materials that may affect bond that were identified in the inspection process shall be completely removed from concrete and bottoms of base plates. All metal surfaces should have a 2 to 3 mil peak-to-valley profile for epoxy grouts.
  - 3. For cementitious mortars and grouts, concrete shall be saturated surface damp. Any standing water shall be removed prior to placing grouts.
  - 4. For epoxy grouts, do not wet concrete surfaces with water. Instead, where required, wet surfaces with epoxy for horizontal work or epoxy gel for vertical or overhead work prior to placing epoxy grouts.

B. Forms and Headboxes for Cementitious or Epoxy Grouts:

1. Forms for grouts shall be built of material with adequate strength to withstand the placement of grouts.
2. Forms must be rigid and liquid tight. All cracks and joints shall be caulked with an elastomeric sealant. All forms shall be lined with polyethylene for easy grout release. Forms carefully waxed with two coats of heavy-duty paste wax shall also be acceptable.
3. Forms shall be 4 to 6 inches higher than the base plate on one side of the base plate configuration when using head pressure for placement.
4. Air relief holes a minimum 1/8 inch in diameter shall be provided when required by a base plate configuration to avoid entrapping air underneath.

**3.04 NON-SHRINK CEMENTITIOUS GROUT**

- A. Prepare concrete surfaces in accordance with the grout manufacturer's instructions.
- B. Do not retemper grout by adding more water after stiffening.

**3.05 EPOXY GROUT**

- A. Prime concrete in accordance with the grout manufacturer's instructions.
- B. Epoxy grouts shall be mixed in complete units. Do not vary the ratio of components or add solvent to change the consistency of the mix.
- C. Mix until aggregate is uniformly wetted. Over mixing will cause air entrapment in the mix.

**3.06 PRESSURE INJECTION OF CRACKS**

- A. Design system to permit injection of adhesive resin at pressures up to 50 psi.
- B. Injection Equipment
  1. Include a mixer and holdover agitator tanks.
  2. Provide gages to indicate pressure used.
  3. Provide a meter capable of indicating the volume of grout used to 1/10 of a cubic foot.

**3.07 DOWEL INSTALLATION**

- A. Install per adhesive manufacturer's instructions.
- B. Obstructions in Drill Path.
  1. Locate holes in existing concrete to miss existing reinforcing. Prior to drilling holes, field verify and mark the location of existing reinforcing using a pachometer or other approved locating equipment.



2. When reinforcing steel is encountered in the drill path, slant drill to clear obstruction. Drill shall not be slanted more than 10 degrees. Where slanting the drill does not resolve the conflict the Contractor shall stop and notify the Project Representative and resolve the conflict to the satisfaction of the Project Representative.
3. Abandoned dowel or anchor holes shall be completely filled with non-shrink grout and struck off flush with the adjacent surface.

### **3.08 CURING**

#### **A. Cementitious Grouts:**

1. Clean equipment and tools as recommended by the grout manufacturer.
2. Cure Grouts in accordance with manufacturer's specifications and recommendations. Keep grout moist for a minimum of 3 days. The method needed to protect grouts will depend on temperature, humidity, and wind. Wet burlap, a soaker hose, sun shading, ponding, and, in extreme conditions, a combination of methods shall be employed.
3. Grouts shall be maintained above 40 degrees Fahrenheit until they have attained a compressive strength of 3,000 pounds per square inch, or above 70 degrees Fahrenheit for a minimum of 24 hours to avoid damage from subsequent freezing.

#### **B. Epoxy Grouts:**

1. Cure grouts in accordance with manufacturers' specifications and recommendations. Do not wet cure epoxy grouts.
2. Consult the manufacturer for appropriate cure schedule. In no case should any surface in contact with epoxy grout be allowed to fall below 50 degrees Fahrenheit for a minimum of 48 hours after placement.

### **3.09 INSPECTION AND TESTING**

- A. Installation of epoxy anchors shall take place under continuous supervision of the Special Inspector, who shall verify hole depth, diameter and cleaning; proper mixing and application of the epoxy materials; and installation of the fastener embedments to the proper depths.
- B. During the course of construction, the Project Representative may take separate field samples of the following materials for confirming tests:
  1. Cement.
  2. Aggregates.
  3. Cement grout mixture.
  4. Commercially manufactured grout products.

- C. The testing laboratory will sample and test grout materials and submit results to the Project Representative.

**END OF SECTION**

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# Division 05

## Metals



**SECTION 05 12 20**  
**STRUCTURAL STEEL**

**PART 1 – GENERAL**

**1.01 QUALITY ASSURANCE**

- A. Materials, Fabrication, and Erection: Conform with the latest edition of AISC *Specification for Structural Steel Buildings and Code of Standard Practice for Steel Buildings and Bridges*.
- B. Welding: By operators qualified by tests as prescribed by the AWS in Standard Qualification Procedure for performance of the type of work required. Structural welding shall be performed by welders certified by WABO or local building department jurisdiction.

**1.02 SUBMITTAL**

- A. Shop Drawings: All fabricated metals illustrating dimensions, erection details, cuts, copes, connections, holes, threaded fasteners, and welds. Base dimensional data on actual field measurements where connections interface with other materials required.
- B. Mill Test Reports: Submit mill test reports for each shipment of materials or products.

**1.03 PRODUCT HANDLING**

- A. Delivery of Materials Installed Under Other Sections:
  - 1. Deliver anchor bolts, anchorage devices, sleeves, and other steel to be embedded in cast-in-place concrete or masonry prior to start of concrete or masonry work.
  - 2. Provide setting drawings, templates, and direction for installation of anchor bolts and other devices.
- B. Store above grade. Protect from corrosive elements.
- C. Handle and store during construction to prevent overstressing any elements.

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. Structural Steel – All new material, clean and free from damage:
  - 1. Rolled Shapes, Bars, and Plates: ASTM A992.
  - 2. Steel Pipe: ASTM A53 Grade B.

3. Tubes (HSS): ASTM A500 Grade B or C.
  4. American Standard S shapes: ASTM A36.
- B. Bolts:
1. Standard Bolts and Nuts: ASTM A307.
  2. High Strength Bolts and Nuts: ASTM A325-N.
  3. Anchor Bolts: ASTM A307.
- C. Welding Electrodes: AWS E70XX.
- D. Finish: All structural steel to be hot-dip galvanized, after fabrication, per Specification Section 05 51 16, "Galvanizing."

## **2.02 FABRICATION**

- A. Fabricate structural and architectural steel in accordance with the appropriate AISC Specifications with the modifications and additional requirements specified in this section.
- B. Weld all shop connections unless otherwise noted.
1. Conform to AWS Code for "Arc Welding in Building Construction."
  2. Remove all weld spatter from exposed surfaces.
- C. Straightness of Structural Members: Straightness of structural members and fabricated assemblies shall conform to AISC Code of Standard Practice for Steel Buildings and Bridges.
- D. Shop Assembly:
1. Fabricate units in as large parts and sections as practicable.
  2. Holes in members: Punch or drill as necessary to receive bolts and similar items. Do not cut holes with a torch.

## **PART 3 – EXECUTION**

### **3.01 ERECTION**

- A. Set and secure structural steel members and appurtenant connections accurately to the required lines and levels shown on drawings.
- B. All procedures and tolerances per AISC Code of Standard Practice for Steel Buildings and Bridges.

- C. Bolts, Anchors and Other Accessories: Install as necessary and as required for erection of structural steel.
- D. Bearing Plates:
  - 1. Provide under all steel, such as ends of beams bearing on concrete.
  - 2. Shim with metal only.
- E. Columns:
  - 1. Set on leveling nuts or on metal shims to accurate elevations and grout solid.
  - 2. Shim with metal only. Do not use wood wedges.
- F. Anchor Bolts and Anchors: Locate and build into connecting work. Preset anchor bolts and anchors attached to templates of configuration required for fastening to structural members.
- G. Grouting: After all structural members have been properly positioned and all bolts and anchor bolts tightened, place grout between concrete and steel. Finish exposed surfaces flush and smooth.

**END OF SECTION**

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**SECTION 05 50 00**  
**METAL FABRICATIONS**

**PART 1 – GENERAL**

**1.01 QUALITY ASSURANCE**

- A. Materials, Fabrication, and Erection: Conform to the latest edition of AISC “Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings” (steel assemblies) and the Aluminum Association’s Aluminum Construction Manual (aluminum assemblies).
- B. Welding: By operators qualified by tests as prescribed by the AWS in “Standard Qualification Procedure” for performance of the type of work required. Structural welding will require all welders to be certified by ICBO or local building department jurisdiction.
- C. Comply with OSHA and Building Code requirements.

**1.02 SUBMITTALS**

- A. Shop Drawings: All fabricated metals illustrating dimensions, erection details, cuts, copes, connections, holes, threaded fasteners, and welds. Base dimensional data on actual field measurements where connections interface with other materials required.
- B. Mill Test Reports: Submit mill test reports for each shipment of materials or products.

**1.03 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle materials in such a manner as to prevent damage to finished surfaces.
- B. Store above grade in clean and dry locations. Protect from corrosive elements.

**PART 2 – PRODUCTS**

**2.01 STRUCTURAL STEEL**

- A. Conform to Section 05 12 20, “Structural Steel.”
- B. All structural steel shall be galvanized unless otherwise specified.
- C. Bolts: As specified in Section 05 12 20, “Structural Steel.”

**2.02 STAINLESS STEEL**

- A. Bars and Shapes: ASTM A276, Type 304.
- B. Plates: ASTM A240, Type 304.

C. Bolts: ASTM A193, Type 316.

D. Nuts: ASTM A194, Type 316.

## **2.03 ALUMINUM**

A. Bars, Plates and Shapes: ASTM B209, Alloy 6061 T6, mill finish.

B. Welding shall comply with AWS D1.2

C. Mechanical Fasteners shall be Stainless Steel.

D. Provide bituminous paint on surfaces bearing on concrete.

## **2.04 GRATING**

A. This section specifies steel bar grating designed for forklift access in the MBR Building.

B. Bar grating shall be W-19-4 galvanized steel grating with bearing bar thickness and depth as shown on the Drawings.

C. Furnish in panel widths not exceeding 4'-0. Lengths of panels to be 10'-0 or as required to fully bear on the supporting steel framing.

D. Band all unsupported edges and cutouts.

E. Fabricate to comply with OSHA requirements.

F. Fasten to steel framing with "G" clips which secure the grating panels with a top accessible bolt, without drilling or welding. There shall be a minimum of two clips per panel, per beam crossing. Clips shall be galvanized or stainless steel finished.

## **PART 3 – EXECUTION**

### **3.01 FABRICATION**

A. Fabricate in accordance with the Drawings and additional requirements specified in this section.

B. Shop Assembly:

1. Fabricate units in as large parts and sections as practicable.

2. Holes in Members: Punch or drill as necessary to receive bolts and similar items. Do not cut holes with a torch. Provide adequate fastenings for wood nailers and similar items.

C. Galvanize all carbon steel bolts, fastenings, and hardware unless otherwise noted.

### **3.02 ERECTION**

- A. Set and secure accurately to the required lines and levels.
- B. Protect the finish from scratches, nicks, and dents during erection.
- C. Repairing galvanizing as specified in Section 05 51 16, "Galvanizing."
- D. Anchor Bolts and Anchors: Locate and build into connecting work. Preset anchor bolts and anchors attached to templates of configuration required for fastening to structural members.
- E. Grouting: After all structural members have been properly positioned and all bolts and anchor bolts tightened, place grout between concrete and metal. Finish exposed surfaces flush and smooth.

**END OF SECTION**

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## **SECTION 05 51 16**

### **GALVANIZING**

#### **PART 1 – GENERAL**

##### **1.01 DEFINITIONS**

- A. Hot-Dip Galvanizing: The dipping of steel members and assemblies into molten zinc for lasting (or long-term) corrosion protection. The resultant zinc coating fuses permanently with the base steel material.
- B. Passivating: The mechanical treatment of freshly galvanized steel materials to prevent humid storage stain (white rust or white corrosion). This treatment (passivation) consists of quenching freshly galvanized steel in water to which a chromate or a chromic-acid solution, or other proprietary solution, has been added.

##### **1.02 QUALITY ASSURANCE**

- A. Reference Standards: American Hot-Dip Galvanizers Association, Inc. (AHDGA): Publication, "Inspection Manual for Hot-Dip Galvanized Products."
- B. Certification: Furnish Certificates of Compliance with ASTM Specifications, and Standards specified herein. Each certificate to be signed by Contractor and galvanizer certifying that steel materials, bolts, nuts, washers, and items of iron and steel hardware conform to specified requirements.

##### **1.03 DELIVERY, STORAGE AND HANDLING**

- A. Packaging: Of type to prevent damage to galvanized surfaces and distortion of steel materials and components.
- B. Handling and Storage: Handle and protect galvanized materials from damage to zinc coating. To avoid humid storage stain, space surfaces of galvanized materials to permit free circulation of air.
- C. Damaged Material: Repair material showing evidence of damage to zinc coating. If not repairable, material with damaged coating will be subject to rejection.

#### **PART 2 – PRODUCTS**

##### **2.01 STEEL MATERIALS**

- A. Material for galvanizing to be geometrically suitable for galvanizing as specified in ASTM A384 and A385. Steel materials suitable for galvanizing include structural shapes, pipe, sheet, fabrications, and assemblies.
- B. Material to be chemically suitable for galvanizing.

## **2.02 IRON AND STEEL HARDWARE**

- A. Bolts, nuts, washers, and items of iron and steel hardware furnished for galvanizing to be suitable for hot-dip galvanizing.
- B. Inspect iron and steel hardware before galvanizing and ascertain whether suitable for galvanizing. Replace items that are not suitable for galvanizing.

## **2.03 ZINC FOR GALVANIZING**

- A. Conform with ASTM B6, and as specified in ASTM A123.

## **2.04 GALVANIZING**

- A. Steel members, fabrications, and assemblies to be galvanized after fabrication, by hot-dip process in accordance with ASTM A123. Weight of zinc coating to conform to requirements specified under "Weight of Coating" in ASTM A123.
- B. Safeguard against steel embrittlement in conformance with ASTM A123.
- C. Safeguard against warpage or distortion of steel members to conform to ASTM A384. Notify Engineer of potential warpage problems that may require modification in design, before proceeding with steel fabrications.
- D. Finish and uniformity of zinc coating and adherence of coating to conform to ASTM A123, A153, or A386, as applicable.
- E. Bolts, nuts, and washers, and iron and steel hardware components to be galvanized in accordance with ASTM A153. Weight of zinc coating to conform to requirements specified under "Weight of Coating" in ASTM A153. Nuts to be tapped after galvanizing to minimum diametral amounts specified in ASTM A563. Coat nuts with waterproof lubricant, clean and dry to touch. High strength bolts for structural steel joints to be galvanized in accordance with ASTM A325.

## **2.05 PASSIVATING**

- A. Galvanized materials subject to extended periods of storage in open, exterior locations to be given passivating treatment or light oiling to prevent humid storage stain. Treatment, solution, and process subject to review and acceptance by Engineer. Chromate passivation should not be used on items galvanized after fabrication which are to be painted after erection.

## **2.06 PRESERVATIVE OILS**

- A. Do not treat freshly galvanized or passivated surfaces with oils, grease, or chemicals, which might interfere with adhesion of subsequent paint primers and coatings.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION OF STEEL MATERIALS**

- A. Steel materials, fabrications, and assemblies are to be installed as shown on the Drawings or specified.

### **3.02 FIELD INSPECTION**

- A. Inspect installed galvanized materials, fabrications, and assemblies in accordance with the applicable requirements of AHDGA "Inspection Manual for Hot-Dip Galvanized Products," for visual inspection.

### **3.03 TOUCH UP AND REPAIR**

- A. Repair damaged galvanized surfaces in accordance with ASTM A780.
- B. Dry film thickness of applied repair materials to be not less than galvanized coating thickness required by ASTM A120, A123, A153, as applicable.
- C. Touch up primed-painted surfaces with same galvanized primer applied in shop. Clean damaged surfaces first to assure proper paint adhesion.

**END OF SECTION**

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## Division 08

### Openings



**SECTION 08 11 13**  
**STEEL DOORS AND FRAMES**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

**1.02 SUMMARY**

- A. This section includes the following:
  - 1. Steel doors.
  - 2. Steel door frames.

**1.03 DEFINITIONS**

- A. Steel Sheet Thicknesses: Thickness dimensions, including those referenced in ANSI A250.8, are minimums as defined in referenced ASTM Standards for both uncoated steel sheet and the uncoated base metal of metallic-coated steel sheets.

**1.04 SUBMITTALS**

- A. Product Data: For each type of door and frame indicated, include door designation, type, level and model, material description, core description, construction details, label compliance, sound and fire-resistance ratings, and finishes.

**1.05 QUALITY ASSURANCE**

- A. Steel Door and Frame Standard: Comply with ANSI A250.8, unless more stringent requirements are indicated.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new work and are acceptable to Engineer. Remove and replace damaged items that cannot be repaired as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch-high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a

humidity chamber. If door packaging becomes wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to permit air circulation.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

#### **A. Available Manufacturers:**

1. Subject to compliance with requirements, manufacturers offering Steel Doors and Frames that may be incorporated into the Work include, but are not limited to, the following:
  - a. Amweld Building Products, Inc.
  - b. Benchmark Commercial Doors; a division of General Products Co., Inc.
  - c. Ceco Door Products; a United Dominion Company.
  - d. Copco Door Co.
  - e. Curries Company.
  - f. Deansteel Manufacturing, Inc.
  - g. Kewanee Corporation (The).
  - h. Mesker Door, Inc.
  - i. Pioneer Industries Inc.
  - j. Republic Builders Products.
  - k. Steelcraft; a division of Ingersoll-Rand.

### **2.02 MATERIALS**

- A. Hot-Rolled Steel Sheets: ASTM A569/A569M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheets: ASTM A366/A366M, Commercial Steel (CS), or ASTM A620/A620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.
- C. Metallic-Coated Steel Sheets: ASTM A653/A653M, Commercial Steel (CS), Type B, with an A40 zinc-iron-alloy (galvannealed) coating; stretcher-leveled standard of flatness.

## **2.03 DOORS**

- A. General: Provide doors of sizes, thicknesses, and designs indicated.
- B. Exterior Doors: Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:
  - 1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush).

## **2.04 FRAMES**

- A. General: Provide steel frames for doors, transoms, sidelights, borrowed lights, and other openings that comply with ANSI A250.8 and with details indicated for type and profile.
- B. Frames of 0.053-inch-thick steel sheet for Level 3 steel doors.
- C. Door Silencers: Except on weather-stripped frames, fabricate stops to receive three silencers on strike jambs of single-door frames and two silencers on heads of double-door frames.
- D. Plaster Guards: Provide 0.016-inch-thick, steel sheet plaster guards or mortar boxes to close off interior of openings; place at back of hardware cutouts where mortar or other materials might obstruct hardware operation.
- E. Supports and Anchors: Fabricated from not less than 0.042-inch-thick, electrolytic zinc-coated or metallic-coated steel sheet.
  - 1. Wall Anchors in Existing Masonry Construction: Provide retrofit CMU anchors per manufacturer's standard design.
- F. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where zinc-coated items are to be built into exterior walls, comply with ASTM A153/A153M, Class C or D as applicable.

## **2.05 FABRICATION**

- A. General: Fabricate steel door and frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in Manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site.
- B. Exterior Door Construction: For exterior locations and elsewhere as indicated, fabricate doors, panels, and frames from metallic-coated steel sheet. Close top and bottom edges of doors flush as an integral part of door construction or by addition of 0.053-inch-thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.

C. Core Construction:

1. One of the following Manufacturer's standard core materials that produce a door complying with SDI Standards:

- a. Vertical steel stiffeners with rigid mineral or glass-fiber board fill.

- D. Clearances for Non-Fire-Rated Doors: Not more than 1/8 inch at jambs and heads. Not more than 3/4 inch at bottom.

- E. Single-Acting, Door-Edge Profile: Beveled edge.

- F. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

- G. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.

- H. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

- I. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series Specifications for door and frame preparation for hardware.

- J. Frame Construction: Fabricate frames to shape shown.

1. Fabricate frames with mitered or coped and continuously welded corners and seamless face joints.

2. Delete subparagraph below if not required. According to ANSI A250.8, temporary spreader bars for welded frames will only be provided if specified and are intended for shipping and handling purposes only.

3. Provide welded frames with temporary spreader bars.

- K. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.

- L. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.

## **2.06 FINISHES**

- A. Prime Finish: Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria. Final door coating to be done on site. Color to match existing doors.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, Manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
  - 1. In masonry construction, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb.
  - 2. Grout fill frames, either prior to installation or after installation. Gaps between frame and masonry greater than 1/4 inch shall be grouted.
  - 3. Seal gaps between frames and surrounding masonry, using foam backer rod and silicone caulking materials to provide a weather-tight seal.
- C. Door Installation: Comply with ANSI A250.8. Fit hollow-metal doors accurately in frames within clearances specified in ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.

### **3.02 ADJUSTING AND CLEANING**

- A. Prime-Coat Touchup: Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

## **END OF SECTION**

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**SECTION 08 71 00**  
**DOOR HARDWARE**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

**1.02 SUMMARY**

- A. This section includes the commercial door hardware for swinging doors.

**1.03 SUBMITTALS**

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  - 2. Organization:
    - a. Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
    - b. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
  - 3. Content:
    - a. Include the following information:
      - 1) Type, style, function, size, label, hand, and finish of each door hardware item.
      - 2) Manufacturer of each item.
      - 3) Fastenings and other pertinent information.
      - 4) Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
      - 5) Explanation of abbreviations, symbols, and codes contained in schedule.



- 6) Mounting locations for door hardware.
- 7) Door and frame sizes and materials.
- 4. Submittal Sequence: Submit initial draft of final schedule along with essential Product Data to facilitate the fabrication of other work that is critical in the Project construction schedule. Submit the final Door Hardware Schedule after Samples, Product Data, coordination with Shop Drawings of other work, delivery schedules, and similar information has been completed and accepted.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by Manufacturer and witnessed by a qualified testing agency, indicating current products comply with requirements.
- D. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 01.
- E. Warranties: Special warranties specified in this section.

#### **1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Engineer, and Owner about door hardware and keying.
- C. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver keys to Contractor.

#### **1.06 COORDINATION**

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

## **1.07 WARRANTY**

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty:
  - 1. Written warranty, executed by Manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
    - a. Structural failures including excessive deflection, cracking, or breakage.
    - b. Faulty operation of operators and door hardware.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period: Two years from date of Substantial Completion, unless otherwise indicated.

## **1.08 MAINTENANCE SERVICE**

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

## **PART 2 – PRODUCTS**

### **2.01 SCHEDULED DOOR HARDWARE**

- A. General: Provide door hardware for each door to comply with requirements in this section, door hardware sets indicated in door and frame schedule, and the Door Hardware Schedule at the end of Part 3. Provide door hardware to match hardware on the existing doors as much as is possible. Key locks to match existing keying schemes.
- B. Named Manufacturer's Products: Product designation and Manufacturer are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

### **2.02 HINGES AND PIVOTS**

- A. Manufacturers: Subject to compliance with requirements, provide hinges by one of the manufacturers listed below.
  - a. Hager Companies.
  - b. McKinney Products Company; Division of ESSEX Industries, Inc.
  - c. Stanley Commercial Hardware; Division of The Stanley Works.

B. Standards:

1. Comply with the following:
  - a. Butts and Hinges: BHMA A156.1.
  - b. Template Hinge Dimensions: BHMA A156.7.

## **2.03 LOCKS, LATCHES, AND BOLTS**

A. Manufacturers:

1. Subject to compliance with requirements, provide Mechanical Locks and Latches by one of the following:
  - a. Corbin Russwin Architectural Hardware; Div. of Yale Security Inc.
  - b. Schlage Lock Company; an Ingersoll-Rand Company.

B. Standards: Comply with BHMA A156.2 Standards for Bored Locks and Latches.

## **2.04 CYLINDERS AND KEYING**

A. Manufacturers:

1. Subject to compliance with requirements, provide cylinders by the same manufacturer as for locks and latches.

B. Standards: Comply with BHMA A156.5 Standards for Cylinders.

C. Cylinders:

1. Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
  - a. Number of Pins: Six.

D. Permanent Cores:

1. Manufacturer's standard; finish face to match lock set; complying with the following:
  - a. Keys: Provide nickel-silver keys.
  - b. In addition to one extra blank key for each lock, provide the following:
    - 1) Cylinder Change Keys: Three.

## **2.05 DOOR GASKETING**

### **A. Manufacturers:**

1. Subject to compliance with requirements, provide Door Gasketing by one of the following:
  - a. National Guard Products, Inc.
  - b. Pemko Manufacturing Co., Inc.
  - c. Reese Enterprises, Inc.

### **B. Standard: Comply with BHMA A156.22.**

### **C. General: Provide continuous weather-strip gasketing where scheduled. Provide noncorrosive fasteners.**

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

### **D. Air Leakage: Not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E283.**

### **E. Gasketing Materials: Comply with ASTM D2000 and AAMA 701/702.**

## **2.06 THRESHOLDS**

### **A. Manufacturers:**

1. Subject to compliance with requirements, provide Thresholds by one of the following:
  - a. National Guard Products, Inc.
  - b. Pemko Manufacturing Co., Inc.
  - c. Reese Enterprises, Inc.

### **B. Standard: Comply with BHMA A156.21.**

## **2.07 FINISHES**

### **A. Standard: Comply with BHMA A156.18.**

### **B. BHMA Designations:**

1. Comply with base material and finish requirements indicated by the following:
  - a. BHMA 630: Satin stainless steel, over stainless-steel base metal.
  - b. Utility Hardware: Zinc plated steel.

## **2.08 LEVER HANDLES**

### **A. Manufacturers:**

1. Subject to compliance with requirements, provide lever handles per handicap code by one of the following:
  - a. Corbin Russwin Architectural Hardware; Div. of Yale Security Inc.
  - b. Schlage Lock Company; an Ingersoll-Rand Company.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- A. Steel Doors and Frames: Comply with DHI A115 series.
- B. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.

### **3.02 INSTALLATION**

#### **A. Mounting Heights:**

1. Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - a. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

#### **B. Install each door hardware item to comply with Manufacturer's written instructions.**

1. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
2. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
3. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

### **3.03 ADJUSTING**

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

### **3.04 CLEANING AND PROTECTION**

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

### **3.05 MBR BUILDING HARDWARE SCHEDULE**

- A. MBR Building Roll-up Door Replacement:
  - 1. Three (3) Pairs: Stanley butts FBB191 4 1/2 by 4 1/2 by NRP stainless steel finish.
  - 2. One (1) Each: Schlage lockset L9070L by 626 finish by 06 style (no substitutions).
  - 3. One (1) Each: Primus permanent core 20-740 (no substitutions).
  - 4. Two (2) Each: Ives flush bolts 458B 12 inches.
  - 5. One (1) Each: Ives dustproof strike 487B by 489B.
  - 6. One (1) Each: Corbin closer D2210 M83.
  - 7. One (1) Each: Kickplate J102 by 10-inch by 630 finish.
  - 8. One (1) Each: Overhead stop C02511 by 626.
  - 9. One (1) Each: Pemko door bottom 315CR.
  - 10. One (1) Piece: Pemko gasket 305CR.
  - 11. Two (2) Pieces: Pemko gasket 305CR.
  - 12. One (1) Each: Pemko threshold 171A by 96 inches long.
  - 13. One (1) Each: Pemko rain drip 346C.
  - 14. One (1) Each: Astragal by door supplier (if required).

**END OF SECTION**

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## Division 09

### Finishes





**SECTION 09 91 25**  
**EQUIPMENT PAINTING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies the surface preparation, painting, and finishing of process, mechanical, and electrical equipment specified in Divisions 22 through 46 of the Contract Documents.
- B. Painting includes field painting exposed bare and covered pipes (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
- D. Prefinished items not to be painted include the following factory-finished components, except where color coding is required:
  - 1. Light fixtures.
  - 2. Distribution cabinets.
- E. Finished metal surfaces not to be painted include:
  - 1. Anodized aluminum.
  - 2. Stainless steel.
  - 3. Chromium plate.
- F. Operating parts not to be painted include moving parts of operating equipment such as the following:
  - 1. Valve and damper operators.
  - 2. Linkages.
  - 3. Sensing devices.
  - 4. Motor, blower, and fan shafts.
- G. Labels: Do not paint over Underwriter's Laboratories, Factory Mutual, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

## **1.02 SUBMITTALS**

### **A. Data Sheets:**

1. For each paint system furnish Safety Data Sheets (SDS, formerly Materials Safety Data Sheets), the manufacturer's Technical Data Sheets, and paint colors available (where applicable) for each product used in the paint system.

### **B. Quality Control Submittals:**

1. Applicator's Qualification: List of references substantiating experience.
2. Factory-Applied Coatings: Manufacturer's certification stating factory-applied coating system meets or exceeds requirements specified.
3. Manufacturer's written instructions and special details for applying each type of paint.

## **1.03 QUALITY ASSURANCE**

### **A. Qualifications – Applicator: Minimum 5 years of experience in application of specified products.**

### **B. Regulatory Requirements: Meet federal, state, and local requirements limiting the emission of volatile organic compounds.**

1. Perform surface preparation and painting in accordance with recommendations of the following:
  - a. Paint manufacturer's instructions.
  - b. SSPC-QS 1 Standard Procedure for Evaluating Coating Contractors.
  - c. Federal, state, and local agencies having jurisdiction.

### **C. Single Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.**

## **1.04 DELIVERY, STORAGE, AND HANDLING**

### **A. Deliver materials to the jobsite in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:**

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Federal specification number, if applicable.
4. Manufacturer's stock number and date of manufacture.
5. Contents by volume, for pigment and vehicle constituents.

6. Thinning instructions.
  7. Application instructions.
  8. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at an ambient temperature greater than the minimum temperature recommended by the manufacturer. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
  - C. Protect materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

## **1.05 JOB CONDITIONS**

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 degrees F and 90 degrees F.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F and 95 degrees F.
- C. Do not apply paint in snow, rain, fog, or mist when the relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point unless specifically allowed by the manufacturer, or to damp or wet surfaces.
- D. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature and humidity limits specified by the manufacturer during application and drying periods.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Available Manufacturers:
  1. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
    - a. Tnemec Company, Inc. (Tnemec).
    - b. PPG Industries, Pittsburgh Paints (PPG).
    - c. Sherwin-Williams.
    - d. Wasser.

## **2.02 PAINT MATERIALS, GENERAL**

- A. Material Compatibility: Provide primers, finish-coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application as demonstrated by the manufacturer based on testing and field experience.
- B. Material Quality: Provide the manufacturer's best-quality trade-sale paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
- C. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.
- D. Colors: Provide color selections made by the Engineer from the manufacturer's full range of standard colors.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.
  - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
  - 2. Start of painting will be construed as the applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work:
  - 1. Review other sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
  - 2. Notify the Engineer about anticipated problems using the materials specified over substrates primed by others, or over existing coated surfaces that are to be prepared and recoated.

### **3.02 PREPARATION**

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation:
1. Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.
  2. Provide barrier coats over incompatible primers and existing coatings, or remove and redo. Notify Engineer in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
  3. Ferrous Metals:
    - a. Clean ungalvanized ferrous-metal surfaces that have not been shop-coated and previously painted metals indicated for painting; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC). At a minimum, the Contractor shall perform surface preparation to SSPC-SP2 and SP3 standards.
    - b. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
    - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
  4. Galvanized Surfaces:
    - a. Clean galvanized surfaces with nonpetroleum-based solvents so that the surface is free of oil and surface contaminants.
    - b. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
  5. PVC Pipe (Exterior):
    - a. Prepare PVC surfaces in accordance with manufacturer's instructions.
    - b. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
    - c. Scarify PVC surfaces.

6. Ductile Iron Pipe:

- a. Prepare ductile or cast iron surfaces in accordance with manufacturers' instructions. Ductile iron pipe in below floor level pipe gallery does not require painting.
- b. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants. Provide solvent cleaning per National Association of Pipe Fabricators Standard NAPF 500-03-01.

D. Materials Preparation:

1. Carefully mix and prepare paint materials according to manufacturer's directions.
2. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
3. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
4. Use only thinners approved by the paint manufacturer and only within recommended limits.

E. Tinting:

1. Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied.
2. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

### 3.03 APPLICATION

A. General:

1. Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth, even surface according to the manufacturer's directions.

5. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
6. The term “exposed surfaces” includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
7. Paint surfaces behind movable equipment the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment with prime coat only.

**B. Scheduling Painting:**

1. Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
2. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

**C. Application Procedures:**

1. Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer’s directions.
  - a. Brushes: Use brushes best suited for the material applied.
  - b. Rollers: Use rollers of carpet, velvet back, or high-pile sheep’s wool as recommended by the manufacturer for the material and texture required.
  - c. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

**D. Minimum Coating Thickness:** Apply materials no thinner than the manufacturer’s recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer and as specified, whichever is greater.

**E. Electrical items to be painted include, but are not limited to, the following:**

1. Exposed conduit and fittings in occupied spaces.
2. Motors provided without factory-applied coatings.

F. Prime Coats:

1. Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others.
2. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

G. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

H. Completed Work:

1. Match approved samples for color, texture, and coverage.
2. Remove, refinish, or repaint work not complying with specified requirements.

### **3.04 CLEANING**

A. Cleanup:

1. At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
2. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Do not scratch or damage adjacent finished surfaces.

### **3.05 PROTECTION**

- A. Protect work of other trades, whether being painted or not, against damage by painting. Protect adjacent walls, floors, and ceilings against splash and overspray. Correct damage by cleaning, repairing or replacing, and repainting. The Contractor shall be solely responsible for costs to repair damages to Owner's property or private property due to splash and overspray.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
- C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
- D. Existing equipment shall be protected during all stages of the painting, including preparation and painting.



### 3.06 PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated. Unless otherwise specified, the word “interior” shall mean the inside of a building or structure, and the word “exterior” shall mean outside exposure to weather elements.
- B. Exterior and Interior Ferrous Metal: Provide the following finish systems over exterior ferrous metal that is not immersed. Primer is not required on shop-primed items or previously painted ferrous metals with sound existing coatings.
  - 1. Satin or Semigloss, Polyamide Epoxy with Polyurethane Finish Coat: Two coats over a rust-inhibitive primer to achieve a total dry film thickness of not less than 10 mils.
    - a. Surface Preparation: At a minimum, the Contractor shall perform surface preparation to SSPC-SP2 and SP3 standards.
    - b. Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 3 mils.
      - 1) Tnemec: Series N69 Hi-Build Epoxoline.
      - 2) Sherwin-Williams: Macropoxy 646 FC B58-600 Series.
      - 3) Wasser: MC-Miozinc 100.
    - c. First Coat: Satin or semi-gloss polyamide epoxy applied at spreading rate recommended by the manufacturer.
      - 1) Tnemec: Series N69 High Build Epoxoline
      - 2) Sherwin-Williams: Acrolon 218 HS B65-650 Series.
      - 3) Wasser: MC-CR 100.
    - d. Second Coat: Aliphatic polyurethane applied at spreading rate recommended by manufacturer.
      - 1) Tnemec: Endura-Shield Series 73.
      - 2) Sherwin-Williams: Acrolon 218 HS B65-650 Series.
      - 3) Wasser: MC-Luster 100.
- C. PVC Pipe: Provide the following finish system over PVC pipe/valves exposed to sunlight:
  - 1. Prepare PVC surfaces in accordance with manufacturer’s instructions.
  - 2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

3. Scarify PVC surfaces and apply coating as directed by Tnemec in writing.
  - a. Total Dry Film Thickness: 4 mils minimum.

### **3.07 COLORS**

#### **A. Pipe Identification Painting:**

1. Coating Color: Coordinate with Owner.
2. Pipe Supports: No. 70 light gray as specified in ANSI 359-A-85.

#### **B. Colors: Provide as designated and as selected by Owner.**

#### **C. Proprietary identification of colors is for identification only. Selected manufacturer may supply matches.**

#### **D. Equipment Colors:**

1. Equipment includes the machinery or vessel itself plus the structural supports and fasteners and attached electrical conduits.
2. Paint equipment one color as selected.
3. Paint non-submerged portions of equipment the color as selected by Owner except as itemized below:
  - a. Dangerous Parts of Equipment and Machinery: OSHA Orange.
  - b. Physical Hazards in Normal Operating Area and Energy Lockout Devices: OSHA Yellow.
  - c. Safety Equipment, Including, but Not Limited to, Eyewashes and Safety Showers: OSHA Green.
4. Fiberglass reinforced plastic (FRP) equipment with an integral colored gel coat does not require painting, provided the color is as selected.

### **END OF SECTION**

Division 13  
Special Construction



**SECTION 13 05 10**  
**IDENTIFICATION AND WARNING SIGNS**

**PART 1 – GENERAL**

**1.01 GENERAL**

- A. Contractor shall furnish and install pipe and equipment labels, valve tags, electrical hazard/ safety labels and signs, and warning signs at the locations specified herein.

**1.02 DESIGN REQUIREMENTS**

- A. Accident prevention signs shall conform with OSHA Section 1910.145 of Subpart J, Part 1910, Chapter XVII, Title 29 of the Code of Federal Regulations. Exit signs shall conform to Section 1910.37(g) of the OSHA Safety and Health Standard for General Industry, Article 10, Section 10.113 of the Uniform Fire Code, and with local fire regulations.
- B. Electrical Safety: Electrical safety signage shall meet all requirements of the NEC, OAR, and local electrical codes. Required signs include electrical hazard and caution signs, arc flash warning/hazard signs, and additional signs as noted in this section and Divisions 26 and 40.

**PART 2 – PRODUCTS**

**2.01 PIPE LABELS**

- A. Exposed Piping (All Systems):
1. Furnish and install self-adhesive type, vinyl pipe labels on all above-grade piping systems, excluding the piping inside the tanks. Labels shall be installed in sufficient locations to fully identify the liquid contents and flow direction of all exposed piping systems. Labels shall be applied close to valves, flanges, branches, changes in direction and wherever pipes pass through walls.
  2. Lettering, Flow Direction Arrows and Pipe System: Black print.
  3. Background: OSHA safety yellow or white. All shall be the same.
  4. Material: Heavy-duty vinyl resistant to wash down, sunlight, mildly corrosive atmosphere, dirt, grease, and abrasion.
  5. Label, Lettering Size, and Color: ANSI A13.1 (latest revision).
  6. Message: Flow direction and pipe system symbol (i.e., WP for potable water). Refer to the pipe schedule in Section 22 13 16, Pipe and Fittings, for all pipe system symbols. Flow direction shall be indicated with a single wrap of arrow tape installed on each side of the pipe marker (two wraps per marker). Arrow tape shall be 1-inch wide with 1,440 arrows per 30-yard roll for pipe diameters less than 4 inches, and 2-inch wide with 720 arrows per 30-yard roll for pipe diameters 4 inches and larger.

7. Labels:

- a. Self-adhesive type, vinyl pipe markers.

8. Manufacturers and Products:

- a. Markers and arrow tape shall be Brady B-946, Seton Opti-code.
- b. Or equal.

B. Buried Piping (Metallic Piping Systems):

- 1. Furnish and install plastic tracer tape over the top of all buried metallic piping. Tape shall be buried 6 inches below finished grade. Tape shall be 6 inches wide, colored the same as the pipe background color and made of inert plastic material suitable for direct burial. Tape shall be capable of being stretched to twice its original length. Tape shall be inscribed with the message "CAUTION – PIPE BURIED BELOW". Message shall be at 2-foot intervals (maximum).

C. Buried Piping (Non-Metallic Piping Systems):

- 1. Furnish and install polyethylene magnetic tracer tape over the top of all buried non-metallic piping. Tape shall be buried 6 inches below finished grade. Tape shall be acid and alkali-resistant, 3 inches wide, 0.005 inch thick, and 140 percent elongation value. Tape shall be colored the same as the pipe background color and shall be inscribed with the message "CAUTION – PIPE BURIED BELOW". Message shall be at 2-foot intervals (maximum).
- 2. Manufacturers:
  - a. Allen Systems.
  - b. W.H. Brady Co.
  - c. Seton N.

## **2.02 EQUIPMENT LABELS**

A. Furnish and install a label for each piece of equipment and related controls identified on the Equipment Schedule provided by the Owner during construction.

- 1. Material: Engraved black phenolic plastic.
- 2. Lettering: Block type, white, 1/2 inch high.
- 3. 3/4-inch margin on each end for mounting holes.
- 4. Size: No less than 2 inches long by 1 inch high.
- 5. Message: Equipment number identification. See Mechanical and P&ID Drawings.
- 6. Mounting: On or adjacent to equipment in a conspicuous place approved by Engineer with stainless steel screws.

## **2.03 VALVE TAGS**

- A. Provide a tag for each 3-inch and larger valve shown on Drawings bearing the message below. Tags shall be installed in an easily visible position.
  - 1. Material: Stainless steel plate.
  - 2. Lettering: Engraved block type, black enamel filled, 3/8-inch high.
  - 3. Size: 1-1/2-inch-diameter disc.
  - 4. Message: Valve size and pipe service symbol as identified in Mechanical Drawings.
  - 5. Mounting: Stainless steel wire (0.063 inch minimum) attached to valve stem.

## **2.04 ELECTRICAL HAZARD AND SAFETY LABELS AND SIGNS**

- A. Furnish and install electrical safety signs, equipment labels, warnings, and markings in accordance with fire and building codes, NEC, OSHA, and Oregon State and local electrical codes and include the following:
  - 1. Arc Flash Hazard: Per NEC 110.
  - 2. Optional Standby Electrical System Labeling: Per NEC 702.8 and Oregon Administrative Rules (OAR).
  - 3. Approval: Markings to indicate listing, labeling, or other approval meeting the requirements of OAR.

## **2.05 WARNING SIGNS**

- A. General: Warning signs shall conform to OSHA Section 1910.145 of Subpart J, Part 1910, Chapter XVII, Title 29 of the Code of Federal Regulations.
- B. Lettering: Single stroke contrasting in color with the background. For those messages for which there are international symbols, use the international symbols. Chain-mounted signs shall have lettering on both sides.
- C. Materials: Signs shall be 0.100-inch-thick fiberglass with embedded fade-proof legends.
- D. Sign Messages: Shall be as follows:

| <b>Type</b> | <b>Message</b>     |
|-------------|--------------------|
| I           | DANGER – 480 VOLTS |

- E. Sign Size: Shall be as follows:
1. Size B: 10 inches by 14 inches.
  2. Size A: 7 inches by 10 inches.

## **PART 3 – EXECUTION**

### **3.01 LABELS**

- A. Coordinate with Owner before placing labels, as the Owner intends to paint pipe in buildings.

### **3.02 WARNING SIGNS**

- A. Surface-mounted signs, mounted on plaster, concrete masonry unit, or concrete shall be mounted to the wall with epoxy-adhesive anchor bolts. All fasteners shall be concealed as much as possible. Use backup material as required to achieve concealed mounting.
- B. Install in accordance with manufacturer's recommendations.
- C. Mount securely, plumb and level.
- D. Mount each sign as close as possible to its respective structure or piece of equipment. Distribute each sign as follows:

| <b>Location</b>         | <b>Size</b> | <b>Message</b> | <b>Mount</b> |
|-------------------------|-------------|----------------|--------------|
| On 480 V Junction Boxes | A           | I              | Box          |
| Switchgear              | B           | I              | Wall         |

**END OF SECTION**

## SECTION 13 05 41

### SEISMIC RESTRAINT REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS

#### PART 1 – GENERAL

##### 1.01 SUMMARY

- A. This section specifies the anchorage and bracing for equipment and seismic anchoring and bracing for suspended equipment and equipment over 200 pounds.

##### 1.02 QUALITY ASSURANCE

- A. Reference Standards: This section incorporates by reference the latest revisions of the following documents. These documents are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

| Reference     | Title                                                   |
|---------------|---------------------------------------------------------|
| IBC 2015      | International Building Code                             |
| ASCE/SEI 7-10 | Minimum Design Loads for Buildings and Other Structures |

##### 1.03 SUBMITTALS

- A. Procedures: Section 01 33 00, "Contractor Submittals."
- B. List of freestanding equipment weighing 200 pounds or more.
- C. Anchorage details for equipment and freestanding items weighing between 200 and 400 pounds.
- D. Sway bracing for elevated or suspended items such as ceiling systems, ducting, conduits, cable trays, and piping.
- E. No less than 4 weeks in advance of equipment installation, for items weighing over 400 pounds. Required anchorage and bracing drawings and calculations bearing the stamp of a Professional Engineer; show the criteria used to determine seismic coefficients and forces applied to the equipment, including seismic zone, soil profile type, and importance factors.

##### 1.04 DESIGN AND PERFORMANCE REQUIREMENTS

- A. In accordance with IBC 2015 Edition, all equipment shall be anchored and braced to resist seismic forces prescribed in the code and ASCE/SEI 7-10, Chapter 13. All equipment includes equipment which is free standing, supported by stand frames, suspended, anchored to walls, and anchored to floors or slabs. Equipment supports specifically detailed on the Drawings are not required to be engineered by the Contractor.
- B. Seismic anchorage and bracing for equipment shall be designed by a State of Washington Registered Professional Engineer using the site-specific seismic criteria.



## **1.05 SITE SEISMIC CRITERIA**

1. Short Periods,  $S_d = 0.80$
2. 1 Second Period,  $S_{d1} = 0.46$
3. Importance Factor,  $I_p = 1.0$
4. Response Modification Coefficient and Amplification Factors: In accordance with ASCE/SEI 7-10 Sections 13.5 or 13.6.

## **PART 2 – PRODUCTS (NOT USED)**

## **PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

## Division 22

### Plumbing



## **SECTION 22 13 16 PIPE AND FITTINGS**

### **PART 1 – GENERAL**

#### **1.01 DESCRIPTION**

- A. This section specifies piping, fittings, and connections. The actual pipe size and fittings shall be as shown on the Drawings and described in the Pipe Schedule specified in Section 22 13 16.1, "Pipe Schedule".
- B. Piping designations (indicating the nominal pipe size and individual piping system) are used throughout the mechanical Drawings. Note that in most cases, the piping system material is not included below the piping designation on the Drawings. Rather, the pipe material (and Pipe Data Sheet Number) for each corresponding piping system is identified in the piping schedule contained in Section 22 13 16.1, "Pipe Schedule". Contractor shall be responsible for matching up the piping system designations shown on the Drawings with the corresponding pipe materials listed in Section 22 13 16.1, "Pipe Schedule", to determine which piping materials are to be installed for this project.

#### **1.02 SUBMITTALS**

- A. Shop Drawings and Product Data per Section 01 33 00, "Submittal Procedures:"
  - 1. Piping layout Drawings showing the locations, lengths, and elevations for all piping systems (exposed, buried, and submerged) in that area with respect to structures, other piping, and utilities (ductwork, etc.). Drawings shall contain details and location of all joints, anchors, supports, fittings, connections, penetrations, valves, piping appurtenances, flexible couplings, manholes, and other items as required.
  - 2. For each piping system identified in the Pipe Schedule, submit pipe, fittings, linings, and coatings to be used for each piping system specified.
  - 3. Manufacturer's handling, delivery, storage, and installation instructions.
  - 4. Submit written verification of required pressure testing.
  - 5. Submit satisfactory bacteriological test reports as specified herein for all potable water piping disinfection.
  - 6. Pipeline layout showing stations and elevations.
  - 7. Details of standard pipe, specials, and fittings.
  - 8. Calculations for pipe design and fittings reinforcement and/or test data.
  - 9. Welder certifications and qualifications.

10. Details of stulling and shipping packaging.

11. Pipe is to be furnished with special lengths, field-trim pieces, and closure pieces as required by Plans and sections for location of elbows, tees, reducers, valves, and other in line fittings. The pipe fabricator shall prepare a pipe laying schedule showing the location of each piece by mark number with station and invert elevation at each end.

**B. Quality Control Submittals:**

1. Manufacturer's Certificate of Proper Installation.
2. Certified welding inspection and test results.
3. Test logs.

**1.03 HANDLING, STORAGE, AND SHIPPING**

- A. Pipe shall be stulled as required to maintain roundness of plus or minus 1 percent during shipping and handling.
- B. Coated pipe shall be shipped on padded bunks with nylon belt tie-down straps or padded banding located approximately over stulling.
- C. Coated pipe shall be stored on padded skids, sand or dirt berms, sandbags, old tires, or other suitable means so that coating will not be damaged.
- D. Coated pipe shall be handled with wide belt slings. Chains, cables, or other equipment likely to cause damage to the pipe or coating shall not be used.

**1.04 PIPING SYSTEMS**

**A. General:**

1. Furnish and install pipe, specials, fittings, closure pieces, supports, bolts, nuts, gaskets, jointing materials, and appurtenances as shown and specified, and as required for a complete and functioning piping system. All pressure pipe joints shall be restrained. stainless steel pipe shall have full circumferential welds.
2. All exposed piping shall be adequately supported and restrained with devices of appropriate design and as specified in Section 22 33 46, "Pipe Hangers and Supports".
3. Lined and coated pipe shall be stored in such a manner that the lining and coating will not crack or otherwise be damaged due to the effects of freezing and thawing, sunlight, and dry weather conditions.

## B. Pipe Laying:

1. Both line and grade shall be checked using survey instruments and recorded in a field book for each piece of pipe and appurtenances laid. The Contractor shall have instruments such as transits, levels, laser devices, and other equipment for transferring alignment and grades from offset hubs. Contractor shall also have, in his employ, a person who is qualified to use such instruments and who shall be on the jobsite at all times when pipe is being installed and shall have the responsibility of placing and maintaining such construction guides. The Contractor shall furnish to the Engineer a copy of the surveyor's notes for the newly installed pipe and appurtenances.
2. At a sufficient distance prior to encountering a known obstacle or tie into an existing pipe, expose and verify the exact location of the obstacle or pipe so that proper alignment and grade may be determined before the pipe sections are laid in the trench and backfilled.
3. Pipe laid on grades of 10 percent or greater shall be installed beginning at the bottom of the slope.
4. Maintain the pipeline free of standing water at all times during construction prior to filling the pipeline for testing.
5. Bends and tees in buried pressure piping systems shall be anchored by means of restrained joints. Restrained joint length shall be as required for the test pressure shown in the piping system. Submit calculations showing the type of restrained joint proposed and the length of restrained joint required. Concrete thrust blocks shall not be used unless specifically shown.

## C. Pipe Installation:

1. All pipe penetrations through reinforced concrete structures shall be constructed to prevent metal-to-metal contact between the pipe and reinforcing steel in the wall. Care shall be exercised to avoid bypassing insulating flanges with cable, piping, or other metallic objects.
2. Equipment shall be positioned and aligned so that no strain shall be induced within the equipment during or subsequent to the installation of piping.
3. When temporary supports are used, they shall be sufficiently rigid to prevent any shifting or distortion of the piping or related work.
4. Flexible couplings shall be installed where shown on the Drawings and at such other points as may be required for ease of installation or removal of the pipe, subject to approval of the Engineer. Flexible couplings shall be of the positive lock type where necessary to prevent separation of pipe due to internal pressure.

## **PART 2 – PRODUCTS**

### **2.01 PIPING SYSTEMS AND CORRESPONDING PIPE MATERIALS**

- A. As specified on Pipe Schedule and Data Sheet(s) located at the end of this section.

### **2.02 JOINTS**

- A. Grooved End System:

1. Grooved-end piping systems shall be installed per Schedule 22 13 16.1.
2. Grooved pipe and groove joints shall be in accordance with AWWA C606. All ductile iron piping shall furnished be with rigid radius grooves, unless otherwise shown on the Drawings. Gasket material shall be Grade “M” halogenated butyl.
3. Grooved Piping Accessories:
  - a. Ductile Iron Piping:
    - 1) Grooved Coupling: Shall be used to connect ductile iron pipe grooved-ends together. Coupling shall be Victaulic, Style 31 AWWA Coupling or approved equal.
    - 2) Grooved Flanged Adapter: Shall be used to connect a ductile iron pipe grooved-end to a 125# flanged connection, with a limited amount of movement. Adapter shall be Victaulic, Vic-Flange Adapter Style 341 or approved equal.
    - 3) Transition Fitting: Shall be used to connect ductile iron pipe grooved-end to an IPS grooved-end connection. Fitting shall be Victaulic, Style 307 AWWA Transition Coupling or approved equal.

- B. Flanged Joints:

1. Flat-faced carbon steel or alloy flanges when mating with flat-faced cast or ductile iron flanges.
2. Higher pressure rated flanges as required to mate with equipment when equipment flange is of higher pressure rating than required for piping.

- C. Threaded Joints: NPT taper pipe threads in accordance with ANSI B1.20.1.

- D. Thrust Tie-Rod Assemblies: NFPA 24; tie-rod attachments, relying on clamp friction with pipe barrel to restrain thrust, are unacceptable.

- E. Mechanical Joint Gland Follower:

1. Ductile iron anchor type, wedge action, with break-off tightening bolts.
2. Manufacturer and Product: EBAA Iron, Inc., MEGALUG®.

F. Butt Fusion Welds for HDPE Pipe: All joints shall meet the requirements of ASTM F 2620 and manufacturer's recommendations including, but not limited to, fusion temperature, alignment, and fusion pressure. Joint strength shall be equal to or greater than the tensile strength of the pipe. Joints shall be watertight and pressure testable to the requirements of ASTM D3212 and the hydrostatic testing as specified in the Contract Documents.

G. Double Ball Flexible Joint:

1. Double ball flexible expansion joints shall be manufactured of ductile iron in accordance with ASTM A536 Grade 65-45-12. Each flexible expansion joint shall be force balanced and capable of deflecting and expanding at the same time to a minimum of 20 degrees. Each ball joint shall possess an external EPDM rubber boot to prevent penetration of outside debris. All pressure seals and gaskets shall be EPDM.
2. All hardware nuts, bolts, and straps shall be Type 304 stainless steel. All ductile iron components shall be coated internally and externally with 15 mils of fusion bonded epoxy and shall be holiday tested with a 1,500 volt spark test, both of which conform to the requirements ANSI/AWWA C213. Every flexible joint unit shall be cycled and pressure tested at 350 pounds per square inch for 3 inches to 24 inches and 250 pounds per square inch for 30 inches and above prior to shipment. Every flexible joint shall be covered by a PE pipe sleeve that is taped firmly to the pipe. Contractor shall leave telescoping sleeve at mid-point to give joint room to expand or contract. Every flexible joint shall be installed per manufacturer's installation instructions.
3. Flexible expansion joints shall be Ebba-Iron Flex Tend or an approved equal.

## **2.03 GASKET LUBRICANT**

A. All lubricant shall be supplied by pipe manufacturer.

## **2.04 BOLTS**

- A. General: Threads shall be as per ANSI B1.1 coarse thread series, Class 2A external and Class 2B internal. Nuts, bolts, and gaskets for flanged fittings and blind flanges shall be designed to withstand the design and test pressure ratings for the pipe.
- B. MBR Building and exposed (above-grade) areas not described below: Provide galvanized steel, ASTM A307, Grade A hex head bolts and ASTM A563, Grade A hex head nuts.
- C. Buried Piping: Provide AISI Type 304 stainless steel bolts and mounting hardware.
- D. Inside Vaults: Provide AISI Type 304 stainless steel bolts and mounting hardware.
- E. Submerged (or buried): Provide AISI Type 316 stainless steel bolts and mounting hardware.

## **2.05 FABRICATION**

- A. Mark each pipe length on outside with the following:
  - 1. Size or diameter and class.
  - 2. Manufacturer's identification and pipe serial number.
  - 3. Location number on laying Drawing.
  - 4. Date of manufacture.
- B. Code markings according to approved Shop Drawings.
- C. Flanged pipe shall be fabricated in the shop, not in the field, and delivered to the site with flanges in place and properly faced. Threaded flanges shall be individually fitted and machine tightened on matching threaded pipe by the manufacturer.

## **2.06 DIELECTRIC CONNECTIONS**

- A. Furnish and install dielectric unions, insulated bushings, or insulated fittings at all connections between piping of dissimilar metals, regardless of whether these dielectric fittings are shown on the Drawings or not.

## **2.07 DATA SHEETS**

- A. Data Sheets are provided at the end of this section and are used to specify each piping system to be used for this project.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION OF BURIED PIPE – GENERAL**

- A. Lines and Grades:
  - 1. In position and to accurate lines, elevations, and grades as shown on Drawings.
  - 2. Slope to drain where possible.
  - 3. Slope pipe uniformly and continuously between control elevations shown on Drawings when slope is not indicated.
- B. Securing In Place: By blocking, brackets, clamps, or other approved methods to secure pipe in place to withstand test pressure without movement.



C. Joint Assembly Installation:

1. O-Ring Joints:

- a. Wire brush clean the exposed ends of the joint surfaces.
- b. Thoroughly lubricate the gasket with material provided by the pipe manufacturer.
- c. Place the gasket in the grooved spigot and relieve tension by inserting a dull instrument under the gasket and completing two revolutions around the circumference of the joint.
- d. Insert the joint to full metal-to-metal contact prior to providing the maximum allowable 1-inch joint opening for any necessary deflection.
- e. Electrically bond the joint through the use of welded steel bars, clips, or copper wires thermite welded to the pipe in the field.
- f. Complete the exterior and interior of the joints with appropriate coating and lining.

2. Field-Welded Joints:

- a. Wire brush the exposed ends of joint surfaces.
- b. A single full-fillet weld shall be provided by certified welders in accordance with AWS D1.1.
- c. Complete the exterior and interior of the joints with appropriate coating and lining.

- D. Inspect each pipe and fitting before lowering into the trench. Inspect the interior and exterior protective coatings. Patch damaged areas in the field. Clean the ends of the pipe thoroughly. Remove foreign matter and dirt from inside of the pipe and keep it clean during and after laying.
- E. Handle pipe in a manner to avoid any damage to the pipe. Do not drop or roll pipe into trenches.
- F. At the location of each joint, dig bell (joint) holes in the bottom of the trench and at the sides to permit completion and visual inspection of the entire joint.
- G. Trenching and Backfilling: All trenching and backfilling required in connection with the piping installations shall be done in accordance with the Division 2 specifications. No piping shall be backfilled before inspection. Pressure piping shall not be backfilled until successfully tested and approved. Trenches shall be backfilled without delay after approval. All trenches shall be shored and braced according to OSHA requirements. Keep all trenches in a dewatered condition during pipe laying.

### **3.02 INSTALLATION OF EXPOSED PIPE – GENERAL**

- A. Complete installation to present neat orderly appearance.
- B. Do not block openings or passageways with piping.
- C. Run piping parallel to walls of building.
- D. Keep piping free from contact with structure or installed items.
- E. Allow clearances for expansion and contraction of pipe.
- F. Anchor horizontal runs over 50 feet at midpoint to force expansion equally toward ends.
- G. Placement of Vertical Piping:
  - 1. Secure at sufficiently close intervals to keep pipe in alignment and to support weight of pipe and contents.
  - 2. Install supports at each floor or vertically; see Section 22 33 46.
  - 3. If piping is to temporarily stand free of support, or if no structural element is available for support during construction, secure in position with wooden stakes or braces fastened to pipe.
- H. Placement of Horizontal Piping:
  - 1. Support at sufficiently close intervals to maintain alignment and prevent sagging.
  - 2. Install hangers at ends of runs or branches and at each change of direction or alignment.
  - 3. Support spacing shall not exceed the manufacturer's recommendations; see Section 22 33 46.
- I. Support at Equipment: Install to not induce strain on equipment during or subsequent to the installation of pipe work.
- J. Provide flexible connection or union at all connections to equipment to facilitate removal for maintenance.

### **3.03 INSTALLATION AT CONCRETE WALLS AND FOOTINGS**

- A. Install wall sleeves and wall spools in advance of pouring concrete.
- B. Flexible Connections: At each exterior wall penetration and at excavation line.

### **3.04 INSTALLATION OF BELL AND SPIGOT, PUSH-ON, AND MECHANICAL JOINT PIPE**

#### **A. Push-On Joint Installation:**

1. Clean hub and insert gasket.
2. Apply gasket lubricant to spigot and inside of gasket.
3. Drive spigot into gasketed hub with pulling tool or suitable device.

#### **B. Mechanical Joint Installation:**

1. Place gland on spigot end.
2. Slip on rubber gasket.
3. Slip on gasket and joint surfaces on the pipe.
4. Thoroughly wet gasket end joint surfaces with soapy solution as recommended by manufacturer.
5. Insert spigot end to full depth with gasket pressed firmly into place in the bell in order to obtain an even “set” all around the joint.
6. Move gland into place, insert bolts, and tighten with fingers.
7. Tighten nuts with wrench, a half turn at a time, moving from one nut to another repeating until all nuts are uniformly tight.
8. Final tightness with torque wrench to manufacturer’s requirements.

### **3.05 FLANGED PIPE INSTALLATION**

- A. Tighten flange bolts so that gasket is uniformly compressed and sealed.
- B. Do not distort flanges.
- C. Leave flange bolts with ends projecting 1/8 to 3/8 inch beyond the face of nut after tightening.

### **3.06 THREADED JOINT INSTALLATION**

- A. Threads: ANSI B2.1, NPT.
- B. Cut threads full and clean with sharp dies.
- C. Ream ends of pipe after threading and before assembly to remove burrs.
- D. Leave not more than three pipe threads exposed at each connection.
- E. Joint Sealer: Teflon thread tape.

### **3.07 WELDED JOINT INSTALLATION**

- A. Shop fabricated to maximum extent possible.
- B. Use welders certified in accordance with the latest requirements of the American Welding Society "Standard Qualifications Procedures."
- C. Repair coating and linings to a condition equivalent to the factory applied coating or lining.
- D. Install coupling at ends of pipe to be welded to provide access for replacing protective lining.
- E. Welded joints shall meet the following requirements:
  - 1. Field-welded joints shall be butt-welded joints, butt-strap joints, or lap-welded slip-on joints welded in accordance with AWWA C206 as revised herein. Butt-strap joints may be flared to facilitate field fitting. However, flaring of the butt strap shall not be performed in the field. Permissible variations in joint design are as follows:
    - a. Miter-cut butt-strap joints and bells (for lap-welded slip-on joints) formed on bevel cut ends.
  - 2. Lap-Welded Slip-On Joints: Where lap-welded slip-on joints are provided for welded joints, the bells shall be formed by expanding with segmental dies on a hydraulic expander, pressing on a plug die, or by rolling. The minimum radius of curvature of any formed surface shall be 15 times the nominal thickness of the steel shell. The bell ends shall be formed in a manner that does not impair the physical properties of the steel shell.
  - 3. Linings and Coatings: Shop-applied interior linings and exterior coatings shall be held back a minimum of 2-1/2 inches from the point at which the weld is to be made. Joints shall be grouted or mortared in the field using sailcloth diapers, or equal, and in accordance with the manufacturer's recommendations. The inside of the finished (welded and grouted) joint shall have a smooth flow surface across the joint.
  - 4. Relative Bell Dimensions: Bell and spigot ends shall be sized to provide a difference in circumferential measurement between the outside circumference of the spigot and the inside circumference of the bell (or butt-strap) of not more than 0.4 inch. The clearance between the spigot and bell (or butt-strap) shall be equalized around the pipe circumference.

### **3.08 GROOVED END SYSTEM**

- A. Grooved-end piping systems can be installed only on 8-inch-diameter ductile iron and SST piping and larger.
- B. Grooved pipe and groove joints shall be in accordance with AWWA C606. All piping furnished shall be with rigid radius grooves, unless otherwise shown on the Drawings. Gasket material shall be Grade "E" or "O" depending on service.

### C. Grooved Piping Accessories:

#### 1. Piping:

- a. Grooved Coupling: Shall be used to connect pipe grooved-ends together. Coupling shall be Victaulic, Style 77 or W89 AWWA Coupling or approved equal.
- b. Grooved Flanged Adapter: Shall be used to connect a ductile iron pipe grooved-end to a 125# flanged connection, with a limited amount of movement. Adapter shall be Victaulic, Vic-Flange Adapter Style 341 or approved equal.
- c. Transition Fitting: Shall be used to connect ductile iron pipe grooved-end to an IPS grooved-end connection. Fitting shall be Victaulic, Style 307 AWWA Transition Coupling or approved equal.

### 3.09 COPPER PIPE INSTALLATION

- A. General: All of the adapters and fittings required for installation of the copper potable water piping system may not be shown on the Drawings. All small diameter fittings, adapters, and connectors may not be shown on the Drawings. Contractor shall furnish and install adapters, connectors, and appurtenances as required to install the copper piping to the ends of fittings, valves, and appurtenances shown on the Drawings to provide a complete piping system at no additional cost to the Owner.
- B. Bending Pipe: Bending of pipe is not allowed; use manufactured fittings for piping changes in direction.
- C. Solder Joints:
  1. Ream or file pipe to remove burrs.
  2. Clean and polish contact surfaces of joint.
  3. Apply flux to both male and female ends.
  4. Insert end of tube into fittings full depth of socket.
  5. Bring joint to soldering temperature, in as short a time as possible.
  6. Form continuous solder bead around entire circumference of joint.
- D. Dielectric Copper Piping Connections: Where copper piping is connected to steel or ductile iron pipe, provide dielectric unions or an insulating section of plastic pipe having a pressure rating equal to the copper piping. Where copper pipe is installed in piping supports, it shall be insulated from the metallic support (unless copper-plated pipe supports are used).

### 3.10 EXPOSED PVC AND CPVC PIPING – PRESSURE INSTALLATION

- A. All of the adapters and fittings required for installation of the PVC and CPVC piping systems may not be shown on the Drawings. All small diameter fittings, adapters, and connectors may not be shown on the Drawings. Contractor shall furnish and install

adapters, connectors, and appurtenances as required to install the PVC piping to the ends of fittings, valves, and appurtenances shown on the Drawings to provide a complete piping system at no additional cost to the Owner.

B. Cutting:

1. Cut pipe with a knife or handsaw.
2. Make cuts square with pipe.
3. Remove burrs by smoothing edges with a knife, file, or sandpaper.

C. Solvent Joints:

1. Clean joint surfaces and apply manufacturer-recommended primer.
2. Coat with solvent cement and join.
3. Hold joint together until cement takes hold.
4. Use sufficient cement so that a bead of cement is formed between pipe and fitting at socket entrance.

D. Threaded Joints: Tighten by strap wrench to not more than one full turn beyond hand tight.

E. CLS and PERM Service: Contractor shall use solvent welded joints to the fullest extent possible. No threaded fitting will be allowed where an equivalent fitting with socket joints is readily available. All threaded joints shall be wrapped with Teflon tape. No barbed fittings and connections are allowed. All gaskets shall be Viton.

1. Contractor shall install all piping in a manner so as not to create any intermediate high points in the piping for:
  - a. The CLS and PERM in the MBR Building.
2. Construct per existing MBR 2 and MBR 3 2-inch pipe arrangement.

### **3.11 WATER PIPING SYSTEMS**

- A. This paragraph applies to the small diameter PVC and copper potable water piping (less than 1-1/2 inches in diameter).
1. All reuse water piping shall be Schedule 80 PVC, as specified in the Data Sheets at the end of this section or SST or Copper as noted. Provide transition from copper to SST piping in a manner that provides dielectric isolation.

- B. Potable Water Contamination: No plumbing fixture, device, equipment, or pipe connection shall be installed that will provide a cross connection or interconnection between a potable water supply and any source of non-potable water.
1. Reducers: Changes in pipe size shall be made with reducing fittings only. Reducing bushings are not permitted; provide full-body reducer fittings only.
  2. Bends: Pipe bending for other than minor misalignment corrections is not permitted. Changes in direction shall be made with fittings.
  3. Dielectric Unions: Connections between ferrous and nonferrous metallic pipe shall be made with insulating unions or flanges.
  4. Unions: Shall be provided where required for disconnection of piping. At a minimum, provide unions downstream of all non-true union valves and at all wall penetrations (one union on either side of wall, 12 inches from wall face).
  5. Expansion: Expansion joints, etc., shall be provided at all connections to the large diameter water piping (4 inches and greater).

### **3.12 TURBIDITY METERS AND DRAIN PIPING**

- A. The Contractor shall be responsible for furnishing and installing all valves, fittings, adapters, tubing, clamps, and pipe supports necessary to install and connect this piping and/or tubing to each analyzer in accordance with the analyzer manufacturer's recommendations. The Contractor shall also coordinate the analyzer sample and drain piping routing and location with the Owner prior to installation.

### **3.13 VENTS AND DRAINS**

- A. Manual air vents shall be provided as shown.

### **3.14 WALL PENETRATIONS**

- A. For wet to dry and ground to wet or dry concrete wall penetrations, provide ductile iron wall pipes with seep rings or Link-Seal with stainless steel type 316 bolts, nuts and washers, with ductile iron wall sleeves or core drilled holes. All PVC piping wall or floor penetrations shall be installed within a sleeve with Link Seal.
- B. Link-Seal shall be used on wall penetrations where called out on the Drawings and is allowable in all locations as an alternative to ductile iron wall pipes with seep rings. Link-Seal shall be used in core drilled or cast-in-place Link-Seal type ductile iron wall sleeves, in strict accordance with manufacturer's recommendations. Grout interior side with non-shrink grout, unless otherwise shown on the Drawings or directed by Engineer.
- C. Ductile iron wall pipes with seep rings of the proper diameter and with suitable ends for connection to adjacent pipes may be used where Link-Seal is not specifically called for on the Drawings. Seep rings shall be installed and shall be a minimum of 2 inches wide, extending at right angles and continuously welded or brazed to the pipe or cast integral with the pipe. Wall pipes shall be of a class equal to or greater than the remainder of the pipe in the line. Seep rings shall be installed by the pipe manufacturer at the time of

fabrication, unless approved by Engineer for specific application. Wall pipes shall be lined per cast ductile pipe specifications. All wall sleeves in direct contact with concrete shall be ductile iron.

- D. Flexible Pipe Couplings. Where buried piping enters or leaves structures, piping shall have two flexible joints to accommodate differential settlement. These flexible couplings are required on all pipe less than 36-inch in diameter wherever a pipeline penetrates a structure or where shown on the Drawings. The two flexible couplings shall be installed within 10 feet of the structure or as directed by the Engineer, or called out on the Drawings. Couplings shall be as noted in Section 22 13 17, "Piping Specialties," or approved equal. Couplings shall be assembled on the job in a manner to ensure permanently tight joints under all reasonable conditions of expansion and contraction. Gasket and O-ring material shall be as recommended by the manufacturer for the intended service. Buried or submerged couplings shall be provided with Type 18-8 stainless steel bolts and nuts. Couplings shall have an epoxy coating finish.

### **3.15 LEAKAGE TESTING**

- A. Perform leakage testing on all piping systems in accordance with Section 22 13 64, "Piping Leakage Testing".

### **PIPE DATA SHEETS FOLLOW**



**DATA SHEET 15200-DS1**  
**Ductile Iron Pipe and Fittings**

|                 |                                                                                   |                                                                                                                                                                                                                    |
|-----------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pipe</b>     | Buried Liquid Service Using Push-On, Mechanical, or Proprietary Restrained Joints | AWWA C110/A21.10, and AWWA C151/A21.51, pressure class conforming to Tables 51.1 and 51.3 for Type 4 trench, 250 psi minimum working pressure.                                                                     |
|                 | Exposed Pipe Using Grooved End and Flange Joints                                  | AWWA C115/A21.15, and AWWA C151/A21.51, thickness Class 53 minimum conforming to Table 51.7, 250 psi minimum working pressure.                                                                                     |
| <b>Lining</b>   | Cement Mortar                                                                     | Single thickness, AWWA Standard C104.                                                                                                                                                                              |
| <b>Coating</b>  | Buried Piping                                                                     | Asphaltic (bituminous) per AWWA C151/A21.51. C104                                                                                                                                                                  |
|                 | Exposed, Embedded, and Submerged                                                  | Apply primer coating.                                                                                                                                                                                              |
| <b>Fittings</b> |                                                                                   | Lined and coated same as pipe.                                                                                                                                                                                     |
|                 | Push-On                                                                           | Shall conform to AWWA C110/A21.10. 250 psi minimum working pressure.<br><br>American Cast Iron Pipe Co., Fastite Joint.<br><br>U.S. Pipe and Foundry, Tyton Joint.                                                 |
|                 | Mechanical                                                                        | AWWA C110/A21.10, C111/A21.11, and C153/A21.53, gray or ductile iron, 250 psi minimum working pressure.                                                                                                            |
|                 | Proprietary Restrained                                                            | AWWA C111/A21.11 and C153/A21.53, ductile iron, 250 psi minimum working pressure.<br><br>Clow Corp., Super-Lock Joint.<br><br>American Cast Iron Pipe Co., Flex-Ring or Lok-Ring Joint.<br><br>U.S. Pipe, TR Flex. |
|                 | Grooved End (8-in and smaller)                                                    | AWWA C606 and C110/A21.10, ductile iron, 250 psi minimum working pressure. Victaulic.                                                                                                                              |
|                 | Flange                                                                            | AWWA C110/A21.10, ductile iron, faced and drilled, 125-pound flat face; or ANSI B16.1, 250-pound raised face. Gray cast iron will not be allowed.                                                                  |
| <b>Joints</b>   | Push-On                                                                           | 250 psi minimum working pressure, AWWA C110/A21.10 and C111/A21.11.<br><br>American Cast Iron Pipe Co., Fastite Joint.<br><br>U.S. Pipe and Foundry, Tyton Joint.                                                  |
|                 | Mechanical                                                                        | 250 psi minimum working pressure. EBAA, MEGALUG®                                                                                                                                                                   |
|                 | Proprietary Restrained                                                            | 150 psi minimum working pressure.<br><br>Clow Corp., Super-Lock.<br><br>American Cast Iron Pipe Co., Flex-Ring or Lok-Ring.<br><br>U.S. Pipe, TR Flex.                                                             |
|                 | Grooved End (8-in and smaller)                                                    | Rigid type radius cut conforming to AWWA C606, 250 psi minimum working pressure. Victaulic.                                                                                                                        |
|                 | Flange                                                                            | 125-pound flat face or 250-pound raised face, ductile iron, threaded conforming to AWWA C115/A21.15. Gray cast iron will not be allowed.                                                                           |
|                 |                                                                                   |                                                                                                                                                                                                                    |

(Data Sheet Continues)

**DATA SHEET 15200-DS1**  
**Ductile Iron Pipe and Fittings (Continued)**

|                        |                                                            |                                                                                                                                                                                                             |
|------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Couplings</b>       | Grooved End (8" and smaller)                               | 250 psi minimum working pressure, malleable iron per ASTM A47 or ductile iron per ASTM 536. Victaulic.                                                                                                      |
|                        | Grooved Flanged Adapter                                    | 250 psi minimum working pressure, malleable iron per ASTM A47 or ductile iron per ASTM A536. Victaulic.                                                                                                     |
| <b>Bolting</b>         | Mechanical, Proprietary Restrained, and Grooved End Joints | AISI Type 304 stainless steel.                                                                                                                                                                              |
|                        | Submerged Flanges                                          | AISI Type 316 Stainless Steel                                                                                                                                                                               |
|                        | 125-Pound Flat-Faced Flange                                | ASTM A307, Grade A galvanized steel hex head bolts, and ASTM A563, Grade A galvanized steel hex head nuts.                                                                                                  |
|                        | 250-Pound Raised Face Flange                               | ASTM A307, Grade B galvanized steel hex head bolts, and ASTM A563, Grade A galvanized steel heavy hex head nuts.                                                                                            |
| <b>Gaskets</b>         | Push-On, Mechanical, and Proprietary Restrained Joints     | EPDM conforming to AWWA C111/A21.11.                                                                                                                                                                        |
|                        | Grooved End Joints                                         | Halogenated butyl conforming to ASTM D2000 and AWWA C606.                                                                                                                                                   |
|                        | Flanged, Water and Sewage Service                          | 1/8 inch thick, EPDM, rated to 200 degrees F, conforming to ANSI B16.21, AWWA C207, and ASTM D1330, Grades 1 and 2.                                                                                         |
|                        |                                                            | Full face for 125-pound flat-faced flanges, flat-ring type for 250-pound raised-face flanges. Blind flanges shall be gasketed covering the entire inside face with the gasket cemented to the blind flange. |
|                        |                                                            | Gasket pressure rating shall exceed the system hydrostatic test pressure.                                                                                                                                   |
| <b>Joint Lubricant</b> |                                                            | Manufacturer's standard.                                                                                                                                                                                    |

**DATA SHEET 15200-DS2**  
**Polyvinyl Chloride (PVC) and CPVC Pipe and Fittings**

|                              |     |                                                                                                                                                                                                                                                                                                                         |
|------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pipe, Pressure</b>        | All | Schedule 80 PVC (unless indicated otherwise): Type I, Grade I or Class 12454-B conforming to ASTM D1784 and ASTM D1785. CPVC shall be Type VI, Grade I with cell classification 23447.<br><br><u>Threaded Nipples</u> : Schedule 80 PVC.                                                                                |
| <b>Pipe, Gravity Sewer</b>   | All | <u>ASTM D1785, Schedule 40</u>                                                                                                                                                                                                                                                                                          |
| <b>Fittings</b>              | All | <u>As Specified Under Pipe Above</u> : ASTM D2466 and ASTM D2467 for socket-weld type and ASTM D2464 for threaded type.                                                                                                                                                                                                 |
| <b>Joints, Pressure</b>      | All | Solvent socket-weld except where shown on Drawings or connection to valves and equipment may require future disassembly.                                                                                                                                                                                                |
| <b>Joints, Gravity Sewer</b> | All | Rubber gasketed joints, ASTM D3212 with gasket per ASTM F477.                                                                                                                                                                                                                                                           |
| <b>Flanges</b>               | All | One-piece, molded-hub type, PVC flat-face flange in accordance with fittings above, 125-pound ANSI B16.1 drilling.                                                                                                                                                                                                      |
| <b>Bolting</b>               | All | <u>Flat-Face Mating Flange or in Corrosive Areas</u> : ASTM A193/A193M Rev A, Type 316 stainless steel Grade B8M hex head bolts and ASTM A194/A194M, Grade 8M hex head nuts.<br><br><u>With Raised-Face Mating Flange</u> : Carbon steel ASTM A307 Grade B square head bolts and ASTM A563 Grade A heavy hex head nuts. |
| <b>Gaskets</b>               | All | 1/8-inch-thick Viton.                                                                                                                                                                                                                                                                                                   |
| <b>Solvent Cement</b>        | All | As recommended by the pipe and fitting manufacturer conforming to ASTM D2564.                                                                                                                                                                                                                                           |
| <b>Thread Lubricant</b>      | All | Use Teflon tape at all threaded connections.                                                                                                                                                                                                                                                                            |

**DATA SHEET 15200-DS2A**  
**Polyvinyl Chloride (PVC) Tubing and Fittings for Turbidity Meters**

|                 |     |                                                                                               |
|-----------------|-----|-----------------------------------------------------------------------------------------------|
| <b>Tube</b>     | All | Tygon tubing or Braided, flexible, clear. 125 psi maximum working pressure.                   |
| <b>Fittings</b> | All | Double sleeve compression, AISI Type 316 stainless steel. Swagelok, A-Lok, or approved equal. |

**DATA SHEET 15200-DS3**  
**Copper and Copper Alloy Tubing and Fittings**

|                        |                                     |                                                                                                                               |
|------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Tubing</b>          | All                                 | Type K, soft or hard temper. Seamless, conforming to ASTM B88 Rev A.                                                          |
| <b>Fittings</b>        | All                                 | Commercially-pure wrought copper, socket joint, conforming to ASTM B75, dimensions conforming to ANSI B16.22.                 |
| <b>Flanges</b>         | All                                 | Commercially-pure wrought copper, socket joint, conforming to ASTM B75, faced and drilled to 150-pound ANSI B16.24 standard.  |
| <b>Bolting</b>         | All                                 | ASTM A307, carbon steel, Grade A hex head bolts, and ASTM A563, Grade A hex head nuts.                                        |
| <b>Gaskets</b>         | All                                 | 1/16-inch-thick non-asbestos compression type, full face, Cranite, Johns-Manville.                                            |
| <b>Filler Material</b> | Soldered Joints, 2 1/2 Inch or Less | Material: 95-5 wire solder (95 percent tin, 5 percent antimony), conforming to ASTM B32, Grade 95TA. Do not use cored solder. |

**DATA SHEET 15200-DS4**  
**Stainless Steel Pipe and Fitting – General Service**

|                           |                        |                                                                                                                                                                                                                                                                                                                                                |
|---------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pipe</b>               | 2-Inch and Smaller     | Schedule 40S: ASTM A312/A312M, Type 316 seamless.                                                                                                                                                                                                                                                                                              |
|                           | 2-1/2 Through 20-Inch  | Schedule 10S: ASTM A778 Rev A “as-welded” grade, Type 316L, pickled, and passivated                                                                                                                                                                                                                                                            |
| <b>Joints</b>             | 2-Inch and Smaller     | Threaded or flanged at equipment as required or shown.                                                                                                                                                                                                                                                                                         |
|                           | 2-1/2-Inch and Larger  | Butt-welded, grooved end, or flanged at valves and equipment.                                                                                                                                                                                                                                                                                  |
| <b>Fittings</b>           | 2-Inch and Smaller     | Threaded Forged: 1,000 CWP, ASTM A182/A182M Rev C Grade F316L.                                                                                                                                                                                                                                                                                 |
|                           | 2-21/2-Inch and Larger | Butt-Welded: ASTM A774/A774M Grade 316L conforming to MSS SP-43, “as-welded” grade, pickled and passivated; fitting wall thickness to match adjoining pipe; long radius elbows unless shown otherwise or grooved-end connections, VIC Style 77, W89, or equal with “E” gaskets. Gaskets for service temperatures over 100 degrees F, Type “O”. |
| <b>Branch Connections</b> | 2-Inch and Smaller     | Tee or reducing tee in conformance with Fittings above.                                                                                                                                                                                                                                                                                        |
|                           | 2-1/2-Inch and Larger  | Butt-welding tee or reducing tee in accordance with Fittings above.                                                                                                                                                                                                                                                                            |
| <b>Flanges</b>            | All                    | Forged Stainless Steel: ASTM A182/A182M Rev C Grade F316L, ANSI B16.5 Class 150 of Class 300, slip-on weld neck or raised face.                                                                                                                                                                                                                |
| <b>Unions</b>             | 2-Inch and Smaller     | Threaded Forged: ASTM A182/A182M Rev C Grade F316, 2,000-pound or 3,000-pound WOG, integral ground seats, AAR design meeting the requirements of ANSI B16.11, bore to match pipe.                                                                                                                                                              |
| <b>Bolting</b>            | All                    | Type 316 stainless steel, ASTM A320/A320M Grade B8M hex head bolts, and ASTM A194/A194M Grade 8M hex head nuts.                                                                                                                                                                                                                                |

(Data Sheet Continues)

**DATA SHEET 15200-DS4**  
**Stainless Steel Pipe and Fitting – General Service (Continued)**

|                         |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Gaskets</b>          | All Flanges        | <p>Flanged, Water, Air, and Sewage Service: 1/8-inch thick, unless otherwise specified, red rubber (SBR), hardness 80 (Shore A), rated to 200 degrees F, conforming to ANSI B16.21, AWWA C207, and ASTM D1330, Grades 1 and 2.</p> <p>Flanged, Hot Air and Fuel Gas Service: 1/8-inch-thick, unless otherwise specified, homogeneous black rubber (EPDM), hardness 60 (Shore A), rated to 300 degrees F, conforming to ANSI B16.21 and ASTM D1330 Steam Grade</p> <p>Blind flanges shall be gasketed covering the entire inside face with the gasket cemented to the blind flange.</p> |
| <b>Thread Lubricant</b> | 2-Inch and Smaller | Teflon tape.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**DATA SHEET 15200-DS5**  
**Galvanized Steel Pipe and Malleable Iron Fittings**

|                         |             |                                                                                                                                            |
|-------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pipe</b>             | All         | Galvanized carbon steel, ASTM A106, Grade B seamless; ASTM A53 Rev A, Grade B seamless, or ERW, Schedule 40 thickness.                     |
| <b>Joints</b>           | All         | Threaded or flanged, as indicated in Section 22 13 16.1, "Pipe Schedule."                                                                  |
| <b>Fittings</b>         | Threaded    | 150- or 300-pound malleable iron, ASTM A197 or ASTM A47, dimensions in accordance with ANSI B16.3.                                         |
|                         | Flanged     | Galvanized forged carbon steel, ASTM A105/A105M, ANSI B16.5, Class 150 or Class 300, threaded, 1/16-inch raised face.                      |
| <b>Bolting</b>          | Flanges     | Carbon steel ASTM A307, Grade A hex head bolts, and ASTM A563, Grade A hex head nuts.                                                      |
| <b>Gaskets</b>          | All Flanges | 1/8-inch-thick, EPDM, hardness 80 (Shore A), rated to 200 degrees F, conforming to ANSI B16.21, AWWA C207, and ASTM D1330, Grades 1 and 2. |
| <b>Thread Lubricant</b> | Threaded    | Teflon tape or joint compound that is insoluble in water.                                                                                  |

**DATA SHEET 15200-DS10**  
**Drain, Waste, and Vent (DWV) Pipe and Fittings**

|                 |     |                                                                                                                                                                                                                                                                          |
|-----------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pipe</b>     | All | Schedule 40 PVC or ABS. Solid wall piping, conforming to ASTM D1785 and ASTM D2655 or ASTM D2661. Manufactured from ridged PVC or ABS compounds with cell class of 12454 per ASTM D1784 and conform to NSF Standard 14.                                                  |
| <b>Fittings</b> | All | Schedule 40 PVC fittings shall be injection-molded tees or factory solvent-welded saddle tees. Saddles fastened to pipe with external bands are not acceptable on any new system unless specifically approved by the Engineer. ABS fittings shall conform to ASTM D2661. |
| <b>Joints</b>   | All | Solvent socket-weld.                                                                                                                                                                                                                                                     |

**END OF SECTION**

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## SECTION 22 13 16.1

### PIPE SCHEDULE

**Table 22 13 16.1. Pipe Schedule<sup>a</sup>**

| Symbol | Service                      | Material <sup>b</sup> | Section 15200 Data Sheet <sup>c</sup> | Installation | Working Pressure (psi) | Test Medium                   | Test (psi) | Test (min) | Remarks                           |
|--------|------------------------------|-----------------------|---------------------------------------|--------------|------------------------|-------------------------------|------------|------------|-----------------------------------|
| CLS    | Chlorine Solution            | PVC                   | DS2                                   | EXP          | 50                     | H <sub>2</sub> O              | 100        | 60         |                                   |
| Drain  | Drain                        | DI                    | DS1                                   | ALL          | 15                     | H <sub>2</sub> O              | 45         | 60         |                                   |
| MBRI   | MBR Influent                 | DI                    | DS1                                   | ALL          | 15                     | H <sub>2</sub> O              | 45         | 60         | Below Grating EL 0.0              |
| MBRI   | MBR Influent                 | SST                   | DS4                                   | ALL          | 15                     | H <sub>2</sub> O              | 45         | 60         | Above Grating EL 0.0 <sup>d</sup> |
| PA     | Process Air Exp              | SST                   | DS4                                   | EXP          | 12                     | air                           | 30         | 60         |                                   |
| PERM   | Permeate SST <sup>e</sup>    | SST                   | DS4                                   | EXP          | 15                     | air                           | 30         | 60         | Except at Pumps                   |
| PERM   | Permeate Exp                 | PVC                   | DS2                                   | EXP          | 50                     | H <sub>2</sub> O              | 100        | 60         | At Permeate Pump                  |
| PERM   | Permeate Buried              | DI                    | DS1                                   | BUR          | 15                     | H <sub>2</sub> O              | 45         | 60         |                                   |
| PD     | Pump Drain                   | DI                    | DS1                                   | ALL          | 20                     | H <sub>2</sub> O              | 50         | 60         |                                   |
| REC    | ML Recycle                   | SST                   | DS4                                   | ALL          | 15                     | H <sub>2</sub> O              | 45         | 60         | Above Grating EL 0.0              |
| REC    | ML Recycle                   | DI                    | DS1                                   | ALL          | 15                     | H <sub>2</sub> O              | 45         | 60         | Below Grating EL 0.0 <sup>d</sup> |
| SI     | Screened Influent            | SST                   | DS4                                   | EXP          | 15                     | H <sub>2</sub> O              | 45         | 60         |                                   |
| SREC   | Stabilized Recycle           | SST                   | DS4                                   | EXP          | 15                     | H <sub>2</sub> O              | 45         | 60         |                                   |
| V      | Vent                         | PVC                   | DS2                                   | ALL          | –                      | H <sub>2</sub> O              | per UPC    | –          | Below Roof                        |
| V      | Vent                         | CPVC                  | DS2                                   | ALL          | –                      | H <sub>2</sub> O              | per UPC    | –          | Above Roof                        |
| WAS    | Waste Activated Sludge       | DI                    | DS1                                   | ALL          | 25                     | H <sub>2</sub> O              | 75         | 60         |                                   |
| W3     | Reclaimed Water <sup>f</sup> | PVC                   | DS2                                   | ALL          | 90                     | H <sub>2</sub> O              | 100        | 50         |                                   |
| W3     | Reclaimed Water <sup>f</sup> | SST                   | DS4                                   | ALL          | 90                     | H <sub>2</sub> O <sup>g</sup> | 150        | 50         | At Screen and Pump Seal Water     |

## NOTES:

- <sup>a</sup> Pipe schedule applies to process piping and plumbing. Pipe schedule is general. Specific details may require variations from table. Where the Drawings show piping that carries two or more service designations, the piping material shall conform to the requirement for the first service listed. (e.g., MBRI/WAS requires MBRI pipe material).
- <sup>b</sup> Unless noted, pipe schedule applies to all sizes for a particular service. All pipe sizes within pipe ranks may not be used. Reference Drawings for sizes used.
- <sup>c</sup> Coating systems per Spec Section 09 91 25, "Equipment and Piping Painting." "Asph" for ductile iron pipe denotes asphaltic coating per the Specifications.
- <sup>d</sup> Except where Drawings show SST pipe below 0.0 elevation.
- <sup>e</sup> PERM pipes in MBR building shall be SST except the PVC pipe as noted around the Permeate Pumps.
- <sup>f</sup> W3 pipe for screens spray water shall be Schedule 40 SST per DS4 and MLI Pump Seal Water shall be copper tubing and SST pipe. All other W3 pipe shall be Schedule 80 PVC.
- <sup>g</sup> Operating temperature is ambient or normal water temperature unless otherwise shown.

| <u>Size</u>     | <u>Material</u>                       | <u>Installation</u>                  | <u>Joint Type</u>                  | <u>Test Type</u>                    |
|-----------------|---------------------------------------|--------------------------------------|------------------------------------|-------------------------------------|
| "All" All Sizes | "CPVC" Chlorinated Polyvinyl Chloride | "All" All Installations              | "BF" Butt Fusion                   | "G" Gravity Test                    |
|                 | "DI" Ductile Iron                     | "BUR" Buried                         | "FL" Flanged                       | "H" Hydrostatic Test                |
|                 | "PVC" Polyvinyl Chloride              | "EMB" Embedded (in concrete)         | "GR" Grooved                       | "IS" In Service                     |
|                 | "SST" Stainless Steel                 | "EXP" Exposed (interior or exterior) | "MJ" Mechanical Joint              | "P" Pneumatic Test                  |
|                 |                                       | "SUB" Submerged                      | "PRJ" Proprietary Restrained Joint | "PC" Test per Uniform Plumbing Code |
|                 |                                       |                                      | "SW" Socket Glued                  |                                     |
|                 |                                       |                                      | "THD" Threaded                     |                                     |
|                 |                                       |                                      | "W" Welded                         |                                     |

**END OF SECTION**



**SECTION 22 13 17**  
**PIPING SPECIALTIES**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Furnish all labor, materials, equipment and incidentals required and install complete and ready for operation all piping specialties as shown in the Drawings and as specified herein.
- B. All piping specialties of the same type shall be from a single manufacturer.

**1.02 SUBMITTALS**

- A. Complete Shop Drawings of all piping specialties shall be submitted in accordance with the Division 01 Specification Sections. Product technical submittal data shall contain the following information and data:
  - 1. Acknowledgment that products submitted meet requirements of standards referenced.
  - 2. Manufacturer's installation instructions.
  - 3. Pressure and temperature rating.
  - 4. Materials of construction.
  - 5. Dimensions and weight.
  - 6. Accessories.
  - 7. Manufacturer's product brochures, cut-sheets, and parts diagrams.

**PART 2 – PRODUCTS**

**2.01 EXPANSION JOINT CONNECTORS**

- A. Elastomer Bellows Connector:
  - 1. Type: Spool, with single, wide, filled arch.
  - 2. Materials: Neoprene or hypalon for liquid. Suitable for 275 degrees F, use EDPM (for PA pipe).
  - 3. End Connections: Flanged, drilled 125-pound ANSI B16.1 standard, with full elastomer face and steel retaining rings. SST hardware.
  - 4. Working Pressure Rating: 140 psig, minimum, for size 12 inches and smaller.
  - 5. Thrust Restraint: Control rods to limit travel of elongation and compression.

6. Manufacturers and Products:
  - a. Red Valve; Redflex J-1W.
  - b. General Rubber Maxi-Joint 1101.
  - c. Or equal.

## **2.02 COUPLINGS**

### **A. General:**

1. All flexible couplings and flanged coupling adapters for pressurized pipe shall be restrained to the adjoining piping connections with tie rods and harnesses. The size and number of tie rods and harnesses provided shall be as required by AWWA Manual M11. Contractor shall be entirely responsible for designing and determining the size and number of tie rods and harnesses.
2. Ductile Iron Pipe Connections: Attach all couplings to adjoining ductile iron piping with bell hanger and wedge restraint glands for buried mechanical joint and push-on joint piping; and thrust retention plates and tie-rods, nuts, washers, and bolts for exposed, flanged piping.
3. Coupling Hardware:
  - a. Exposed Installations: Provide high-strength, galvanized steel tie rods, bolts and nuts.
  - b. Buried Installations: Provide Type 304 stainless steel tie rods, bolts, and nuts on all buried couplings and assemble with an anti-galling compound.
4. Restrained couplings or other fittings that use set screws, pointed-end screws to penetrate the outside surface of the pipe for restraint are not acceptable.

### **B. Steel Middle Rings and Followers:**

1. Fusion bonded, epoxy-lined, and coated in accordance with AWWA C213.
2. Pressure tested beyond yield point, for pressure piping.

### **C. Flexible Couplings:**

1. Manufacturers and Products:
  - a. Steel Pipe:
    - 1) Dresser; Style 38.
    - 2) Smith-Blair; Style 411.
    - 3) Or equal.

D. Transition Couplings:

1. Manufacturers:

- a. Dresser; Style 62.
- b. Smith-Blair; Style 413.
- c. Or equal.

E. Flanged Coupling Adapters:

1. Manufacturers and Products:

- a. Stainless Steel Pipe: Material and gaskets must be rated for 275 degrees or greater.

F. Restrained Flange Coupling Adapters:

1. Manufacturers and Products:

- a. Ductile Iron Pipe:
  - 1) Romac Industries, Inc.; RFCA Series.
  - 2) EBAA Iron Inc.; Series 2100 Megaflange.
  - 3) Or equal.

## **2.03 SERVICE SADDLES**

A. Double-Strap SST:

- 1. Pressure Rating: Capable of withstanding 150 psi internal pressure without leakage or over stressing.
- 2. Run Diameter: Compatible with the outside diameter of the pipe on which the saddle is installed.
- 3. Taps: Iron pipe threads with screwed on flange.
- 4. Materials:
  - a. Body: SST.
  - b. Straps: SST.
  - c. Hex Nuts and Washers: 304 SST.
  - d. Seal: Rubber.

5. Manufacturers:
  - a. Romac Industries, Inc.; Style double strap 202NS.
  - b. Smith-Blair.
  - c. Dresser.
  - d. Or equal.

B. For PVC pipe:

1. Pressure Rating: Capable of withstanding 150 psi internal pressure without leakage or over stressing.
2. Run Diameter: Compatible with the outside diameter of the pipe on which the saddle is installed.
3. Materials:
  - a. Body: SST.
  - b. Seal: Buna-N.
  - c. Clamps and Nuts: Stainless steel.
4. Manufacturer: Romac 202NS; or equal.

## **2.04 WALL MECHANICAL SEAL**

A. Modular Mechanical Seal:

1. Type: Interconnected synthetic rubber links shaped and sized to continuously fill annular space between pipe and wall sleeve opening.
2. Fabrication: Assemble interconnected rubber links with ASTM A276, Type 316 stainless steel bolts, nuts, and pressure plates.
3. Size: According to manufacturer's instructions for the size of pipes shown to provide a watertight seal between pipe and wall sleeve opening, and to withstand a hydrostatic head of 40 feet of water.
4. Manufacturer: Thunderline Link-Seal, or equal.

## **2.05 PRESSURE GAUGES**

- A. Pressure and vacuum gauges shall be of the local mounting type. (See Divisions 40 and 46 for pressure gauges.) Diaphragm seal required for liquid applications.

B. Construction:

1. Bourdon tube or bellows type with 275 degrees C.W. pointer travel.
2. Seal shall be annular type, the in-line full stream captive sensing the liquid.
3. Flexible cylinder shall be Buna-N.
4. Gauges shall be rated for 50 psig.
5. All metallic wetted parts shall be 316 stainless steel.
6. Connection for all gauges shall be male 1/2 inch NPT with square wrench flats.
7. Dials shall be 4-1/2 inches in diameter, white field with black numerals.
8. Accuracy shall be 1 percent of full scale maximum and readable to 1 percent.
9. Case material shall be phenolic plastic.
10. Glycerin filled.
11. Unless specified otherwise, gauge shall have a range of 0 to -15 psig.

C. Manufacturers: The gauges shall be a product of Ashcroft, U.S. Gauge, or equal.

## **2.06 PIPING INSULATION SYSTEMS**

A. General: All work to be furnished and installed under this section shall include but not be limited to, providing insulation for the following:

1. External exposed piping, for freeze protection where applicable. All external exposed liquid piping 4-inch diameter and smaller shall be insulated and heat traced. W3 system where piping is exposed and not drained when flow is shut off, including, but not limited to, W3 pipe on outside of structure walls. Exterior insulation shall have a weather and moisture protection cover.
2. Process air (PA) piping in Blower Room within 8 feet of the floor shall be insulated; PA valves and flow meters shall not be insulated.

B. Pipe Insulation:

1. Type A (Glass Fiber):
  - a. Owens Corning Fiberglas SSL II Pipe Insulation; ASTM C547; rigid molded, noncombustible, K(ksi) value of 0.23 at 75 degrees F.
  - b. Fittings, valves, and flanges for all sizes, external, exposed, shall be insulated with premolded fiberglass fittings securely fastened in place. Premolded insulation for pipe flanges, valves, and fittings shall be removable and replaceable type for ease of maintenance. "Zeston" type insulation with plastic cover may be used. Plastic

cover shall be tacked in place and all joints, seams, and laps shall be taped watertight.

- c. Maximum Service Temperature: 275 degrees F.
- d. Jacket, Exterior Applications: Aluminum, 0.02-inch thick; smooth/embossed finish; Fasten with 0.015-inch thick aluminum bands 3/8-inch wide; or UV inhibited PVC equivalent. Jacket shall be taped watertight for external exposed piping.

## **2.07 MISCELLANEOUS SPECIALTIES**

### **A. Strainers, Water Service, 2 Inches and Smaller:**

- 1. Type: Stainless Steel, Y-pattern, 200-psi nonshock rated, with screwed gasketed cap.
- 2. Screen: Heavy-gauge Type 304 stainless steel or Monel, 24-mesh.
- 3. Manufacturers:
  - a. Armstrong International, Inc.
  - b. Mueller Steam Specialty.
  - c. Or equal.

## **2.08 FLEXIBLE SCHEDULE 40 PVC (MBR CASSETTES)**

### **A. When existing MBR cassettes are transferred to another MBR tank, the Contractor shall provide 10- to 15-inch flex PVC connections with flanges, between each cassette permeate header (16 total) and wall penetration where 2-inch permeate pipe exits the MBR tank. Pipe shall be provided by FP FlexiblePVC.net (or equal). Product shall meet the following:**

- 1. Pipe shall be rated for 125 psi or greater working pressure.
- 2. TekTube Ultra Flexible PVC Pipe is Made in the USA.
- 3. True Schedule 40 PVC Pipe – Uses Standard Schedule 40 Fittings and PVC Glue – can be connected to rigid PVC with ease.
- 4. Temperature range – 10 degrees F to 125 degrees F.
- 5. Colors: Black, White (NSF Approved).
- 6. A true Schedule 40 rigid PVC spiral resists crushing and impact.
- 7. FDA non-toxic formulation UV and Antimicrobial resistant.
- 8. Manufactured in the USA with the highest quality PVC compounds.
- 9. Flexible for easy handling and installation.

### **B. MUST USE PROPER FITTING TO MEET BURST PSI NOT WORKING PSI.**

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. All piping specialties and appurtenances shall be installed in the location shown on the Drawings, unless approved otherwise, true to alignment and rigidly supported. All piping specialties shall be installed in strict accordance with the manufacturers' recommendations. Any piping specialty that is damaged during installation, startup and testing shall be repaired at no cost to the Owner.
- B. Install concrete inserts for pipe supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all Plans and figures which have a direct bearing on their location and he shall be responsible for the proper location of these piping appurtenances during the construction of the structures.
- C. Alloy steel bolts and nut for flanged joints shall be made with high strength, SST bolts, nuts, and washers.
- D. Restrained plugs, blind flanges, and caps installed for pressure testing shall be fully secured and blocked to withstand the test pressure.
- E. Modular Seals: Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing elements to expand and provide an absolutely watertight seal between the pipe and wall opening.

### **3.02 SERVICE SADDLES**

- A. General:
  - 1. Metal Piping: Double-strap SST.
  - 2. Plastic Piping: Stainless steel Romac 202NS.

### **3.03 COUPLINGS**

- A. General:
  - 1. Install in accordance with manufacturer's written instructions.
  - 2. Before coupling, clean pipe holdback area of oil, scale, rust, and dirt.
  - 3. Do not remove pipe coating. If damaged, repair before joint is made.
  - 4. Application:
    - a. Metallic Piping Systems: Flexible couplings, transition couplings, and flanged coupling adapters.
    - b. Concrete Encased Couplings: Flexible coupling.

### **3.04 FLEXIBLE PIPE CONNECTIONS TO EQUIPMENT**

- A. Install to prevent piping from being supported by equipment, for vibration isolation and where shown.
- B. Product Applications Unless Shown Otherwise:
  - 1. Nonmetallic Piping: Teflon Bellows Connector.
  - 2. All Other Piping: Elastomer Bellows Connector.
- C. Limit Bolts and Control Rods: Tighten snug prior to applying pressure to system.

### **3.05 PIPE SLEEVES**

- A. Application:
  - 1. As specified in Section 22 13 16, "Pipe and Fittings".
  - 2. Above Grade in Non-submerged Areas: HDPE.
  - 3. Below Grade or in Submerged or Damp Environments: Stainless steel.
- B. Installation:
  - 1. Support noninsulating type securely in formwork to prevent contact with reinforcing steel and tie-wires.
  - 2. Caulk joint with rubber sealant or seal with wall penetration seal.

### **3.06 PAINTING**

- A. Exterior surfaces of all metallic and PVC (non-stainless steel) piping specialties specified herein shall be field-painted in accordance with Section 09 91 25, "Equipment and Piping Painting".

### **3.07 INSPECTION AND TESTING**

- A. All piping specialties shall be subjected to hydrostatic pressure testing as described in Section 22 13 64, "Piping Leakage Testing". All leaks shall be repaired and lines retested as approved by the Engineer. Prior to testing, all piping specialties shall be supported and thrust restrained for forces in excess of the test pressure to prevent movement during tests.

**END OF SECTION**



**SECTION 22 13 18**  
**HEAT TRACING FOR PIPE**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Furnish and install a heat tracing system on the new exposed W3 water piping located at the Headworks screens, as specified herein, and as needed for a complete and proper installation. Refer to the Mechanical Drawings for the length of piping to be heat traced.

**1.02 SUBMITTALS**

- A. Submit Shop Drawings and product data per Section 01 33 00, "Submittal Procedures," including the manufacturer's detailed specifications.
- B. Submit operation and maintenance (O&M) manuals in compliance with pertinent provisions of the Division 1 specifications.

**1.03 QUALITY ASSURANCE**

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

**PART 2 – PRODUCTS**

**2.01 HEAT TRACE SYSTEMS**

- A. Provide a thermostatically controlled heat trace system as shown on the Drawings.
- B. Control each heat trace system through a weatherproof thermostat.
- C. Requirements for heat trace systems are as follows:
  - 1. Design each heat trace system to automatically limit process temperature to 45 degrees F liquid temperature when outdoor ambient conditions range from 10 to 45 degrees F and 20 MPH winds.
  - 2. Base heat trace system design on the following:
    - a. Thermal conductivity of piping materials.
    - b. Heat output exceeding heat loss by a 1.5 safety factor at the specified performance requirement. Thermwire TW-wrap system with 5 watts per foot minimum.

3. Self-regulating heat trace cable constructed, designed, and rated as follows:
  - a. 16 AWG copper bus wires.
  - b. Semi-conductive polymer core with electrical resistance variable with temperature.
  - c. Flame retardant, electrically insulating jacket.
  - d. Tinned copper braid.
  - e. Water and chemical resistant, flame retarding thermoplastic rubber insulation overjacket.
  - f. Operates on 120 V, 60 Hz ac power source as shown on the Drawings.
  - g. Maximum 90 degrees F maintained temperature.
4. Provide male plug end so trace can be powered by existing receptacles and also 10 feet of power cable between receptacle and pipe to be wrapped. Provide ambient sensing thermostats, splicing kits, end seal kits, and other accessories as required.

D. Acceptable Manufacturers:

1. Chromalox.
2. Delta-Therm.
3. Or equal.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. Install and field test heat trace system prior to installation of insulation.

### **3.02 FIELD QUALITY CONTROL**

- A. Conduct field tests as follows:
1. Continuity check.
  2. Short circuit check.

## **END OF SECTION**

**SECTION 22 13 19**  
**VALVES AND OPERATORS**

**PART 1 – GENERAL**

**1.01 SUBMITTALS**

- A. The following information shall be submitted to the Engineer. In accordance with Section 01 33 00, "Contractor Submittals", copies of all materials required to establish compliance with this section. Submittals shall include the following:
1. Product Data and Shop Drawings:
    - a. Dimensions, port shape, diameter, materials, capacity, and operator.
    - b. Manufacturer's certification that products meet or exceed minimum requirements as specified.
    - c. Flow versus pressure drop curves for balancing and throttling valves.
    - d. Cv or pressure drop data. Required pressure to open for elastomer check valves.
    - e. Calculations of required valve operating torque.
  2. Quality Control Submittals:
    - a. Manufacturer's Certificate of Proper Installation for electric operators.
  3. Operation and maintenance manual.

**1.02 QUALITY ASSURANCE**

- A. All valves and operators of the same type shall be by a single manufacturer, unless otherwise specified.

**PART 2 – PRODUCTS**

**2.01 GENERAL**

- A. Valve to include operator, actuator, handwheel, chainwheel, extension stem, floor stand, worm and gear operator, operating nut, chain, wrench, and accessories for a complete operation.
- B. Valve suitable for intended service.
- C. Valve same size as adjoining pipe.
- D. Valve ends to suit adjacent piping.

- E. All valves shall be coated as described in this section. If a coating is not given in this section, then valves shall be coated per Specification Section 09 91 25 "Equipment and Pipe Painting."
- F. Size operator for the full range of pressures and velocities.
- G. Valve to open by turning counterclockwise.
- H. Factory mount operator, actuator, and accessories.

## **2.02 CHECK VALVES**

### **A. Swing Check Valves:**

- 1. Type: Full operating, with outside lever and spring.
- 2. Size: 2 inch through 36 inch.
- 3. Rating: 150 psi CWP.
- 4. AWWA C508.
- 5. Body and Trim: Iron body, stainless steel mounted.
- 6. Ends: Flanged.
- 7. Disc Facing: Stainless steel.
- 8. Hinge Shaft: Stainless steel.
- 9. Outside Lever Position: Provide most suitable lever position based on the field constraints.
- 10. Lever Seal:
  - a. 3-Inch through 12-Inch Valves: Hinge pin extended through outside lubricated bronze bushing and O-ring seals.
  - b. 14-Inch and Larger Valves: Same, except outside packed glands instead of O-rings.
- 11. Lubrication: Grease fittings for outside lubrication of lever seals.
- 12. Wetted parts of valve shall not contain bronze, copper, or aluminum.
- 13. No type of cushioning shall be installed on the valve.

14. Manufacturers and Products:

- a. The use of a manufacturer's name, model, size, or catalog number is for the sole purpose of establishing the standard of quality and general configuration desired. Engineer listing of the manufacturers and models does not guarantee compliance with the specified requirements. The Contractor is responsible to select equipment which meets the specified requirements.

- 1) CCNE, 9001.
- 2) APCO, CVS 6000.
- 3) Or equal.

B. Double Disc Check Valve:

- 1. 2 inch to 20 inch:
  - a. Body and All Trim Material: 316 SS ASTM A351 and A240.
  - b. Rating: 150 psi.
  - c. Temperature Rating: 275 degrees F or greater.
  - d. Style: Lugged.
  - e. Resilient Seating: Viton A.
  - f. Manufacturers: DeZurik Apco Series 9000 or approved equal.

**2.03 BALL VALVES**

A. 3-Inch and Smaller:

- 1. Rating: 600 psi WOG, 150 psi SWP.
- 2. Type: Full port, same as line size.
- 3. Body and Trim: 316 SST.
- 4. Ball: Type 316 stainless steel.
- 5. Ends: Screwed.
- 6. Stem Seals: TFE or Viton O-ring, in-line seal replacement and adjustment.
- 7. Seats: Replaceable TFE seats suitable for water and air service.

8. Operator: Lever with indicator stop.

9. Manufacturers and Products:

- a. Milwaukee, 30 SSOF-02.
- b. Nibco T-580-56-R-66-LL.
- c. Or equal.

B. Double Union PVC Ball Valves, 3 Inches and Smaller (PVC Piping): Double Union Ball valves installed in PVC piping systems 3-inch size and smaller shall be constructed from polyvinyl chloride (PVC) ASTM 1784, rated to 150 psi minimum from 30 to 120 degrees F, double union design with two-way blocking capability, socket end connection, double EPDM O-ring seals and EPDM backing cushions, PTFE seals, ABS handle, NSF-61 certified. Valves shall be suitable for both oxalic acid and hypochlorite solutions. The port diameter shall be no smaller than the inside diameter of the adjoining Schedule 80 PVC pipe. Manufactured by Hayward "True Union Ball Valve," or Nibco "Chemtrol Tru-Bloc Ball Valve," or Ryan Herco "True Union Ball Valve." Valves used for sodium hypochlorite shall have the ball designed to be constantly vented to eliminate gas accumulation. These vented valves to be identified with black handles. Hayward "Z-Ball" or approved equal.

C. Double Union CPVC Ball Valves, shall be Asahi Type 21/21a CPVC, tru-union valves or equal. Above other requirements for PVC ball valves also apply.

## 2.04 BUTTERFLY VALVES

A. Materials:

1. Valves shall be DeZurik Figure BAW or equal and constructed of the following materials:

| Component                                  | Material                              |
|--------------------------------------------|---------------------------------------|
| Shaft:                                     | Stainless steel, ASTM A276, Type 304. |
| Disc:                                      | Cast iron, ASTM A126, Class B.        |
| Seat Sealing Surface:                      | EPDM rated for 275 degrees or higher. |
| Body:                                      | Cast iron*, ASTM A126, Class B.       |
| Disc Edge:                                 | Nickel.                               |
| *Provide dielectric isolation to SST pipe. |                                       |

2. Valves shall be the stub or through shaft design. No variety of wafer-type ends are acceptable for buried service. Valve flange drilling shall be per ANSI B16.1, Class 125.
3. Valves, paint, and materials shall be rated for 275 degrees at 175 psig and shall provide drip-tight shutoff up to the full valve rating on dead-end or isolation service. Seat shall be mechanically held in place and shall be field replaceable.

## **2.05 PLUG VALVES**

- A. Size: 4 inch to 54 inch.
- B. Type: Eccentric plug valves, straight flow, nonlubricated, resilient plug type with port suitable for drip tight, bi-directional shutoff at the specified design pressure. Valves must have a minimum of 80 percent of adjacent full pipe area.
- C. Rating:
  - 1. 12 Inches and Smaller: 150 psi.
  - 2. 14 Inches through 36 Inches: 40 psi.
- D. Body: Cast iron, ASTM A126, Class B or C504.
- E. Plug: Cast iron, ASTM A126, Class B, or cast iron, ASTM A436 (Ni-resist), or ductile iron, ASTM A536.
- F. Plug Facing: EPDM.
- G. No wetted parts of bronze, copper, or aluminum.
- H. Body Seats: Welded-in overlay of 90 percent nickel content on all surfaces contacting the plug face.
- I. Packing: Buna V-flex or TFE adjustable.
- J. Ends: Flanged.
- K. Operators:
  - 1. 6 Inches and Smaller: Lever operated, unless otherwise indicated.
  - 2. Larger than 6 Inches: Totally enclosed worm gear operators with handwheel or chainwheel as required.
  - 3. Handwheels shall not be smaller than 6 inches or larger than 18 inches.
  - 4. Operator shall be sized for the valve operating pressure in accordance with AWWA C504.
- L. Manufacturers and Products:
  - 1. DeZurik, PEC.
  - 2. Or equal.

## **2.06 RESILIENT SEATED GATE VALVES**

### **A. Size: 1-inch to 3-inch:**

1. Type: Single solid resilient wedge, fully encapsulated with EPDM, with nonrising stem and screwed bonnet.
2. Rating: 250 psi working pressure.
3. Ends: Threaded.
4. Body and Bonnet: Ductile iron ASTM A536.
5. Coating: Electrostatically applied fusion-bonded epoxy-resin, meeting AWWA C550 requirements.
6. Stem: Stainless steel ASTM A582.
7. Wedge: Brass, encapsulated with EPDM-rubber compound.
8. Bonnet and Gland Bolts: AISI Type 304 stainless steel.
9. Stem Seal: Polyamide.
10. Manual Operator: Handwheel.
11. Manufacturers and Products:
  - a. Mueller.
  - b. Approved equal.

### **B. Size: 3-inch to 20-inch:**

1. Nonrising stem, complying with AWWA C509.
2. Iron body, bronze mounted, resilient seat.
3. Full port.
4. Fusion epoxy-coated inside and outside, complying with AWWA C550.
5. Rated 200 psi CWP.
6. Flanged ends.
7. Thermoplastic antifriction washer above the thrust collar, O-ring seals above and below the thrust collar.
8. Suitable for continuous operation in a septic atmosphere.



9. Manufacturers and Products:

- a. Mueller Company.
- b. M&H Valve Company.
- c. Or equal.

## **2.07 SOLENOID VALVES**

A. Two-Way Metallic Solenoid Valves, 1-1/4 Inches and Smaller, General Service:

- 1. Solenoid valves shall be designed for use in both horizontal and vertical piping and shall be designed for continuous contact with water.
- 2. Valve shall have forged brass (Alloy C23000) bodies with Viton seats. All seals shall be Viton.
- 3. Valves shall be designed for normally closed operation.
- 4. Internal plunger, core tube, plunger spring, and cage assembly shall be AISI Type 304 stainless steel.
- 5. Solenoid enclosures shall be NEMA 4. Valve actuators shall be 120 Vac.
- 6. Valves shall have a design operating pressure of 150 psi.
- 7. Manufacturers and Products:
  - a. ASCO Valve Inc.
  - b. Approved equal.

## **2.08 MANUAL OPERATORS**

A. General:

- 1. Operator force not to exceed 80 pounds under any operating condition, including initial breakaway. Gear reduction operator when force exceeds 80 pounds.
- 2. Operator self-locking type or equipped with self-locking device.
- 3. Position indicator on all valves.
- 4. Worm and Gear Operators: One-piece design worm gears of gear bronze material. Worm hardened alloy steel with thread ground and polished. Traveling nut type operators, threader steel reach rods with internally threaded bronze or ductile iron nut.

B. Exposed Operator:

- 1. Galvanized and painted handwheels.
- 2. Lever operators allowed on quarter-turn valves 6-inch and smaller.

3. Cranks on gear type operators.
4. Chainwheel operator with tiebacks, extension stem, floor stands, and other accessories to permit operation from normal operation level.
5. Valve handles to take a padlock, and wheels a chain and padlock.

C. Buried Operator:

1. Buried service operators on valves larger than 2-1/2 inches shall have a 2-inch AWWA operating nut. Buried operators on valves 2 inches and smaller shall have cross handle for operation by forked key. Enclose moving parts of valve and operator in housing to prevent contact with the soil.
2. Design buried service operators for quarter-turn valves to withstand 450 foot-pounds of input torque at the FULLY OPEN or FULLY CLOSED positions, grease packed and gasketed to withstand a submersion in water to 10 psi.
3. Buried valves shall have extension stems, bonnets, and valve boxes.

## 2.09 ELECTRIC OPERATORS

- A. Refer to Kubota submittal information to determine what valve operators are being provided by them.
- B. Provide EIM controls electric operators for valves complete with gear train in cast aluminum housing, motor, declutchable hand-wheel operator, two-piece bronze stem nut, non-intrusive integral control components, and mounting hardware.
- C. Provide motor, gear train, and control components prewired and mounted in a NEMA 4 and NEMA 6 enclosure, including a reversing starter with thermal overloads, a step-down transformer to power any lower voltage components, a three-position local-stop-remote selector switch, open-close pushbuttons, local position indicator, adjustable open and close limit switches, adjustable torque switch, a space heater, and valve indicator lights.
- D. Voltage: 480 Vac, 3 Phase.
- E. Provide standard duty valve operator as follows:
  1. Operation: Process isolation.
  2. Duty Cycle: Minimum of 60 starts per hour.
- F. Provide pre-wired terminal blocks to allow status and control signals listed below to be hardwired to PLC:
  1. Fully Closed limit switch (N.O. contact that closes when valve is fully closed).
  2. Fully Open limit switch (N.O. contact that closes when valve is fully open).
  3. Remote control selected (N.O. contact that closes when switch is in "Remote").

4. Local stop selected (N.O. contact that closes when switch is in “Stop”).
  5. Local control selected (N.O. contact that closes when switch is in “Local”).
  6. Actuator failure (N.O. contact that closes when both “high torque” limit switches actuate).
  7. Remote Open command (N.O. contact that closes when PLC “Open” output is true – 120 Vac on).
  8. Remote Close command (N.O. contact that closes when PLC “Close” output is true – 120 Vac on).
- G. Note that existing PA system 12-inch butterfly valves FCV 2131, 2231, 2331, and 2431 shall have modulating operators installed. Operators to be rated for modulating duty and position feedback. Contractor to match to existing valves.
- H. Acceptable Manufacturers:
1. EIM No substitutes.

## **2.10 THREE-WAY BALL VALVES (SEE KUBOTA’S SUPPLY)**

- A. Materials: Valves are to match existing PERM-CLS 3 way valves. Must be suitable for contact with hypochlorite and oxalic acid solutions.
1. Body: Stainless.
  2. Ball: Stainless 316.
  3. Body Seals: Teflon..
  4. Seals: Teflon.
- B. Connections: screwed Class 125.
- C. Pressure Rating: 175 psi.
- D. Acceptable Manufacturers:
1. Worcester, Series D44/D4.

## **2.11 NEEDLE VALVES**

- A. Needle valves shall be stainless steel Parker A-Lok VGLQ Compression or NPT in-line valves, rated for 200 psi or greater.

## **2.12 SEWAGE AIR RELEASE VALVES (FOR REC PIPE)**

- A. Type: Sewage air release valve with spring loaded float, mechanical venting mechanism providing mechanical advantage to provide a complete seal without leakage.
- B. Size: 2-inch threaded inlet with a maximum 0.02-square-inch air release orifice.
- C. Working Pressure Range: 0.7 to 250 psi with 360 psi test pressure.
  - 1. Valve shall release air through the entire working pressure range specified without any leaks or seepage from valve.
- D. Funnel Shaped Lower Body and Base: Reinforced Nylon.
- E. All Inner Metal Parts: Stainless Steel SAE316
- F. Float: Foamed Polypropylene
- G. Rolling Seal: Silicone
- H. Backflush Connection: 1-1/2-inch Camlock on top of valve
- I. Drain Tap: 1/4-inch Stainless Steel SAE316
- J. Maximum Valve Height: 22.3 inches.
- K. Valve Options:
  - 1. Non-Slam discharge throttling attachment – Throttles air discharge.
  - 2. One-Way, Out only attachment – Allows for air discharge only and prevents air intake.
- L. Manufacturers and Products:
  - 1. ARI Model D-025 L LP.
  - 2. Or equal.

## **2.13 BALL CHECK VALVE**

- A. A nonclog sinking type ball check valve for horizontal or vertical operation in sewage. Design valve such that the ball is out of liquid flow when the valve is open. Ball to move freely in housing and not to experience concentrated wear. Guide ball to and from seat by smooth ribs cast into valve body. Valve body interior to have no projections or pockets to trap solids or stringy material. Valve cover to be removable for cleaning and ball inspection or replacement.
  - 1. Valve Body: Cast iron with ANSI Class 125 flat faced flanges for valves 2 inches and over. Bronze body and cap for valves less than 2 inches with threaded connections.
  - 2. Ball: Sinking type hollow steel ball with vulcanized nitrile rubber coating. Coating to be resistant to grease, petroleum products, animal and vegetable fats, dilute

concentrations of acids and alkalis (pH 4-10), tearing and abrasion; have a high load bearing capability, and low compression set.

3. Products: Flygt, Golden Anderson Figure 240-D or equal.

#### **2.14 PRESSURE REDUCING VALVE (SEAL WATER SYSTEM)**

- A. The pressure reducing valve for MLR pump seal water shall be a CLA-VAL Model 90-01 or Watts LF25AUB-23. See Drawings for location and size. Provide with copper tube to NTP transition. Valve shall reduce 90 psi pressure to between 25 to 30 psi for MLS pump seal water

#### **2.15 KNIFE GATE VALVES**

- A. Type: Stainless knife gate valve for sewage services with round port and resilient seat. Drip-tight shut-off.
- B. Ends: Flange, Class 150/125 ANSI B16.1, and all flange holes tapped.
- C. Pressure Rating: 50 psi minimum.
- D. 304 SS wetted parts.
- E. Packing Gland: 304 SS.
- F. Actuator: Handwheel. Chainwheel shall be provided where specified. Wheel shall be sized in accordance with AWWA C500 and shall include a 2-inch-square AWWA operating nut. Chain shall be supplied with operator when chainwheel required.
- G. Manufacturer: Fabri-Valve Figure CF37, DeZurik KUL or KGN, or equal. All knife gate valves shall be supplied by one manufacturer.
- H. No wetted parts shall be bronze, aluminum, or copper.

#### **2.16 VALVE BOXES**

- A. Valve boxes shall be cast iron two-piece slip-type standard design with a base corresponding to the size of the valve, coal tar painted with manufacturer's standard. Valve boxes for sewer and reclaimed water shall include cast iron ring and pentagon bolt locking cast iron cover labeled "SEWER", or "PERMEATE" as appropriate.
- B. Six-inch- and 10-inch-diameter valve boxes shall be per WSDOT Standard Specification Section 9-15.5.
- C. Underground enclosures for valves assemblies shall be polymer concrete with open base. Size shall be sufficient to allow access to valves and assemblies for repair and/or removal without removing enclosure. Enclosures shall have 10,000-pound-rated bolt-down cover. Enclosures shall be as manufactured by "Synertech" or approved equivalent.
- D. Contractor to provide two valve tee wrenches to fit 2-inch buried valve nuts.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. General: Valves and accessories shall be installed in a manner and location as shown on the Drawings or as required for the application and in accordance with manufacturer's instructions. Size of valve is equal to line piping in which valve is installed unless otherwise noted on the Drawings. Support all valves where necessary. In case of conflict between these Specifications and a governing code, the higher standard shall prevail.
- B. Check Valves: Check valves shall be installed in horizontal runs only, unless otherwise shown on the Drawings. Disc, if applicable, shall not open into a bend or another valve.
- C. Accessories:
  - 1. Provide all accessories necessary for proper valve operation as specified or required for the application.
  - 2. Provide extension stems for submerged valve service where indicated on the Drawings or required for convenient operation. Provide sufficient number of adjustable cast iron stem guides such that the ratio of unsupported length of stem to radius of stem does not exceed 200. Provide suitable floor stands with operators at approximately 30 inches high where indicated on Drawings or required for proper valve operation. Small lever or handwheel-operated valves may utilize handrails or other suitable structure for support of extension stems.
- D. Valve Operators: Valves shall be installed with the operator in a position for convenient operation. Particular care shall be taken to ensure that space is available for operation of lever or handwheel-operated valves without interference from walls, piping, or equipment. Any valve that is installed, in the opinion of the Owner, in a manner that operation is inconvenient, shall be modified or removed and reinstalled in a manner suitable to the Owner. Operators for manual valves shall be lever or handwheel as is standard with the manufacturer unless another type of operator is specified or required by the manufacturer.
  - 1. All valves 6 inches and smaller shall be lever actuated.
  - 2. All buried valves to be provided with operating nut and valve box.
- E. Adjustments: Check and adjust valves and accessories for smooth and optimum operation. Lubricate in accordance with manufacturer's recommendations. All globe, angle, and gate valves shall have stuffing boxes packed with an excess of 30 percent of packing (for future adjustment).

### **3.02 VALVE LEAKAGE AND FIELD TESTING**

- A. Test valves for leakage at the same time that the connecting pipelines are tested. See Section 22 13 64, "Piping Leakage Testing," for pressure testing requirements. Protect or isolate any parts of valves, actuators, or control and instrumentation systems whose pressure rating is less than the pressure test. Valves shall show zero leakage. Repair or replace any leaking valves and retest.

- B. Operate manual valves through five full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. Do not backfill buried valves until after verifying that valves operate from full open to full closed. If valves stick or bind, or do not operate from full open to full closed, repair or replace the valve and repeat the tests.
- C. Gear actuators shall operate valves from full open to full close through three cycles without binding or sticking. The pull required to operate handwheel-operated valves shall not exceed 80 pounds. The torque required to operate valves having 2-inch AWWA nuts shall not exceed 150 foot-pounds. If actuators stick or bind or if pulling forces and torques exceed the values stated previously, repair or replace the actuators and repeat the tests. Operators shall be fully lubricated in accordance with the manufacturer's recommendations prior to operating.

### **3.03 COATING**

- A. Coat all valves, except those of elastomeric construction, in accordance with Section 09 91 25, "Equipment Painting." Color shall match the adjoining piping.

### **END OF SECTION**

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## SECTION 22 13 20

### STOP GATES

#### PART 1 – GENERAL

##### 1.01 SUMMARY

- A. This section specifies fabricated stop/weir gate for control of wastewater flow. Gate shall be aluminum and fit into existing stainless steel frame.
- B. Performance Requirements:
  - 1. Gate is provided to block flow and provide overflow through channel, for the purpose of isolating treatment unit screen.
  - 2. Gates shall be designed for the specified seating heads.
  - 3. Design gates and frames with a safety factor of 5 with regard to tensile, compressive, and shear strength, and with the requirement that all gates will comply with field leakage tests specified in AWWA C563, Section 5.2.3.1 or AWWA C561 as applicable to the gates provided. Calculations shall be submitted to show conformance.
  - 4. Materials of construction shall be suitable for the environment.

##### 1.02 QUALITY ASSURANCE

- A. Referenced Standards: This section incorporates, by reference, the latest revisions of the documents listed. These documents are part of this section insofar as specified and modified herein. In case of conflict between the requirements of this section and the listed documents, the Contractor shall point out the conflict to the Engineer; lacking a definitive answer otherwise, the requirements of the Contract Specifications shall prevail.

| <b><u>Reference</u></b> | <b><u>Title</u></b>                                                   |
|-------------------------|-----------------------------------------------------------------------|
| AWWA C561               | Fabricated Stainless Steel Slide Gates                                |
| D1149                   | Test Method for Rubber Deterioration – Surface Ozone Cracking Chamber |

- B. Unit Responsibility: Assign unit responsibility, to the corrosion-resistant gate manufacturer for the gates and actuators specified in this section.
- C. Factory Tests: Shop performance test per AWWA C563, Section 5.2 or AWWA C561 as applicable to the gates provided.
- D. Guaranty: In addition to the guaranty specified in the General Terms and Conditions, the corrosion-resistant gate manufacturer shall guarantee, when installed and operated as recommended by the manufacturer, with a documented maintenance program, trouble-free operation for a period of ten (10) years. If the Owner is not completely satisfied with the performance of the products, the manufacturer shall remedy the problem at no

cost, or refund the materials and installation cost upon the return of the equipment. The manufacturer shall guarantee the following:

1. Leakage shall be no more than that allowed by the AWWA C563 or AWWA C561 standards as applicable to the gates provided during the guarantee period.
2. Gate shall be free of sticking or binding as judged by the Engineer (move freely via operator provided) with no exercising required.

### **1.03 SUBMITTALS**

A. Procedures: Section 01 33 00, "Submittal Procedures."

B. Items to be submitted for this specification:

1. Product information, calculations, charts, or graphs.
2. Plan, cross-section, and details showing proposed mounting for each size and typical application of gate.
3. Manufacturer's data including materials of construction, construction details of equipment, wiring diagrams, and weight of equipment.
4. Materials of construction, with ASTM reference and grade.
5. Dimensions, port size, weight, and capacity
6. Manufacturer's product literature.
7. Manufacturer's operation and maintenance information.
8. Electric motor operator data, where applicable, including manufacturer's catalog information, complete dimensional data, drive unit size, calculations substantiating selection, and wiring diagrams.
9. Certificate of unit responsibility attesting that unit responsibility has been assigned.
10. A copy of this specification section, with addendum updates included, and each paragraph check marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.

### **1.04 STOP/WEIR GATE SCHEDULE AND REQUIREMENTS**

A. The stop gate schedule is provided for the convenience of the Contractor and may not be inclusive. Contractor shall verify all gate dimensions from the drawings.

- B. Gates shall be manufactured by Golden Harvest, Whipps, Waterman or Fontaine.

| Gate Schedule |           |                                 |                         |                           |                     |                   |
|---------------|-----------|---------------------------------|-------------------------|---------------------------|---------------------|-------------------|
| Gate.         | Gate Type | Channel/Open Size<br>(inch WxH) | Gate Height<br>(inches) | TOW to Gate<br>Centerline | Bottom Seating Sill | Seating Head (ft) |
| At Screen 2   | Stop/Weir | 24 x 48                         | 28                      | 34                        | in channel          | 2.5               |

NOTES FOR GATE SCHEDULE:

1. Manufacturer to coordinate with Contractor to manufacture stop gate to match existing gate frame and seals.

## PART 2 – PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURES

- A. Contractor shall verify all gate dimensions from the field.
- B. Gates shall be manufactured by Golden Harvest, Whipps, Waterman or Fontaine.

### 2.02 ALUMINUM-STAINLESS STEEL STOP GATES

- A. Provide stainless steel stop gate frames, with aluminum stop gates. All stop gate frames shall be 304 stainless steel, provided with a Neoprene rubber flush bottom seal, ASTM D2000. Frames shall be fabricated of 1/4-inch thick minimum stainless steel. Side seals shall be constructed of UHMWPE, neoprene, or EPDM with a cord seal or J-seal on both sides. For J-seals, the side seals shall be retained to the slide using compression strips or 304 stainless steel guide bars and screws. Stop gates shall be fabricated of 1/4-inch thick minimum anodized aluminum, sized as required for the gate opening shown on the schedule and shall be reinforced as necessary to assure long life under the specified operating conditions. Leakage shall not exceed 0.1 USGPM/ft of seal periphery under the design seating or unseating head.
- B. Guide frames shall be extruded or welded stainless steel shapes of sizes and types shown and called out on the schedule, with factory-welded corners for embedding in concrete with Neoprene flush bottom seal. The slide shall consist of a flat plate with formed plates or structural members to limit its deflection to 1/720 of the gate span under the design head. All other surfaces shall be mill finish.

## PART 3 – EXECUTION

### 3.01 INSTALLATION

- A. Install in accordance with manufacturer's instruction and as shown on the Drawings (to be provided at a later date).
- B. Installation of the gates and appurtenances shall be done in a workmanlike manner. It shall be the responsibility of the Contractor to handle, store and install the equipment specified in this section in strict accordance with the manufacturer's recommendations.

- C. The Contractor shall review the installation drawings and installation instruction prior to installing the gates.
- D. The gate assemblies shall be installed in a true vertical plane, square, and plumb.

### **3.02 FIELD TESTING**

- A. After installation, all gates shall be field tested in the presence of the Engineer and Owner to ensure that all items of equipment are in full compliance with this section. Each gate shall be cycled to confirm that the gate operates without binding, scraping, or distorting.
- B. Leakage Tests: AWWA C563, Section 5.2.3 or AWWA C 561 as appropriate.
- C. Each gate shall be water tested by the Contractor, at the discretion of the Owner, to confirm that leakage does not exceed 0.05 gpm per linear foot of seating perimeter.

### **END OF SECTION**

**SECTION 22 13 29**  
**SUBMERSIBLE SEWAGE PUMPS**

**PART 1 – GENERAL**

**1.01 EQUIPMENT NUMBERS**

- A. Plant Drain Sump Pump 1: P-2225.
- B. Plant Drain Sump Pump 2: P-2226.

**1.02 SUMMARY**

- A. This section covers electric submersible type sewage pumps and accessories. The pumps shall be designed for handling raw unscreened sewage and wastewater containing solids, rags, and other fibrous materials without clogging. Pumps shall be designed for heavy-duty service.
- B. Furnish each pump complete with base elbow, submersible motor, power cable, guide rails, and accessories.
- C. The pump manufacturer shall warrant all equipment provided under this section, whether or not it is manufactured by the pump manufacturer, so that there is one source for warranty and product service. Technicians specifically trained and certified by the manufacturer to support the product and employed by the pump supplier shall service the pumps and motors.
- D. Coordination: Coordinate mounting/anchor bolt locations in wet well bottom.

**1.03 SUBMITTALS**

- A. Shop Drawings and product data prior to manufacture:
  - 1. Manufacturer, model, weight, and horsepower.
  - 2. Catalog information, descriptive literature, specifications, and identification of materials of construction.
  - 3. Manufacturer's published warranty documents.
  - 4. Pump performance curves demonstrating compliance with the specified Pumping Conditions. Indicate all specified duty points and recommended limits of operation graphically on pump performance curves. Include curves for total head (feet), efficiency, brake horsepower, and net positive suction head required, each plotted against flow in gallons per minute (gpm).
  - 5. Impeller type, size, and identification.

6. Motor Submittal Data:
  - a. Completed Motor Data Form.
  - b. Guaranteed minimum efficiency at rated load at rated voltage.
  - c. Guaranteed minimum power factor at rated load at rated voltage.
  - d. Expected efficiency at 1/2, 3/4, and full load at rated voltage.
  - e. Expected power factor at 1/2, 3/4, and full load at rated voltage.
  - f. Motor no-load current at rated voltage.
  - g. Full-load current at rated voltage.
  - h. Full-load current at 110 percent voltage.
  - i. Starting current at rated voltage.
  - j. Full-load speed.
  - k. Motor nameplate data.
  - l. Certified copy of test report for identical motor tested in accordance with NEMA MG 1 Part 31 and IEEE Standard 112, Test Method B.
7. Cable Assembly Data:
  - a. Insulation and conductor materials of each cable assembly.
  - b. Outer diameter dimensions of each cable assembly.
8. Complete dimensional drawings of equipment, including pumps, motors, piping connections, details of construction, and weights.
9. Guide system and discharge elbow base dimensions and materials.
10. Factory finishing system.
11. Mechanical seal information.
12. Weight of each pump.
13. Size and template for anchor bolts for discharge elbows.
14. Certificate of compliance with ISO 9001 Quality System.
15. Complete installation instructions.
16. Procedure for factory testing.
17. MiniCAS product information and wiring diagram.

- B. Prior to shipment to jobsite:
  - 1. Operations and Maintenance Manuals.
  - 2. Field testing procedure.
  - 3. Certified factory test results:
    - a. Hydrostatic and performance.

- C. Closeout Submittals:
  - 1. Manufacturer's Certificate of Proper Installation.
  - 2. Certified field test results.
  - 3. Spare parts.

#### **1.04 QUALITY ASSURANCE**

- A. Unit Responsibility: In order to ensure coordination, all pumps, motors, power cable, base elbows, and accessories shall be supplied by one pump manufacturer.
- B. All pumping equipment furnished under this section shall be of a design and manufacture that has been used in similar applications and it shall be demonstrated as such to the satisfaction of the Owner.
- C. To ensure a consistent high standard of quality, the manufacturer of this pumping equipment shall comply with the requirements of the ISO 9001 Quality System, and such compliance shall be verified by an independent certification agency approved by the International Organization for Standardization. Documentation shall be submitted for approval showing compliance with this requirement, and the equipment will not be released for shipment until approved.

#### **1.05 SPARE PARTS**

- A. Provide one set of the manufacturer's recommended spare parts kit. The spare parts kit shall, at a minimum, include the following:
  - 1. Inner and outer mechanical seals.
  - 2. Upper and lower bearings.
  - 3. One set of O-rings for the entire pump.

## **1.06 SOURCE QUALITY CONTROL**

- A. Each pump shall be factory tested and certified test results submitted prior to shipment of pumps. The Engineer shall be given notice of the factory pump testing a minimum of 14 days in advance of testing.
  - 1. Impeller, motor rating, and electrical connections shall be checked for compliance to the Specifications.
  - 2. A motor and cable insulation test for moisture content or insulation defects in accordance with ANSI/HI 11.6.
  - 3. Performance and Hydrostatic Testing: Each pump shall be operationally tested to demonstrate compliance with performance requirements. The pumps shall be tested at full speed with the minimum water depth specified. A minimum of eight test points shall be plotted on the full speed pump curve showing horsepower, efficiency, and head and flow from shut-off head to the specified run out condition plus 20 percent. Reduced speed performance criteria may be demonstrated by applying the affinity laws to the full speed test curve. During the testing, each pump shall be run continuously for a minimum of 30 minutes. Performance and hydrostatic testing shall conform to the most recent Hydraulic Institute Standards test codes, ANSI/HI 11.6, Acceptance Grade 1U.
  - 4. After performance and hydrostatic testing, the cable insulation shall be tested again for moisture content.
  - 5. Tabulated and graphical test results shall be certified by the manufacturer and submitted for approval by the Engineer prior to shipment of the pumps.

## **1.07 WARRANTY**

- A. The submersible sewage pumps and associated equipment shall be warranted from the date of commissioning against defects in materials and workmanship.
- B. Manufacturer's warranty must meet or exceed the following coverage: 100-percent coverage for 18 months, with 50-percent coverage for 21 months, and 25-percent coverage for 24 months.
- C. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

## **1.08 PROTECTION**

- A. Box, crate, or otherwise completely enclose and protect all equipment during shipment, handling, and storage.
- B. Protect equipment from exposure to elements, and keep all items thoroughly dry at all times.



- C. Store motors, electrical equipment, and other equipment with moving parts in weathertight warehouses at a maintained temperature of 60 degrees F minimum.
- D. Painted Surfaces: Protect against impact, abrasion, discoloration, and other damage.
- E. Protect electrical equipment, controls, and insulation against moisture or water damage.

## **1.09 CRITICAL SPEED AND VIBRATION**

- A. Each complete pump assembly shall have no critical or resonant frequencies or multiples of resonant frequencies within 30 percent above and 30 percent below the range of pump speeds and blade pass frequencies required to meet the Performance Requirements. Complete assemblies shall be free of objectionable or destructive vibration throughout the specified operating range.
- B. Vibration levels shall comply with the most recent edition of the Hydraulic Institute Standards.
- C. Verify that equipment is mutually compatible and free of resonance over the complete operating range.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS AND PRODUCTS**

- A. Submersible Sewage Pumps:
  - 1. Flygt Model NP 3102 SH 3.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Pumps Guaranteed Performance:
  - 1. Pumping Condition A<sup>1</sup> – Rated Capacity at Full Speed:
    - a. Capacity: 250 gpm.
    - b. Total Head: 52 feet.
    - c. Minimum Hydraulic Efficiency: 55 percent.
    - d. Approximate Pump Speed: 3,440 rpm.
  - 2. Pumping Condition B<sup>1</sup> – Run Out at Full Speed:
    - a. Capacity: 450 gpm
    - b. Total Head: 12 feet.
    - c. Approximate Pump Speed: 3,440 rpm.

3. Pumping Condition C<sup>1</sup> – High Head at Full Speed:
  - a. Capacity: 100 gpm
  - b. Total Head: 80 feet.
  - c. Approximate Pump Speed: 3,440 rpm.
4. Minimum Shut-Off Head: 100 feet.
5. Minimum Hydraulic Efficiency at Best Efficiency Point: 55 percent.
6. Minimum Non-compressible Solids Passage: 1.0 inches.
7. Motor: 6.5 horsepower<sup>2,3</sup>.
8. Minimum Suction Diameter: 3 1/8 inches.
9. Minimum Discharge Diameter: 3 1/8 inches.

#### NOTES

- <sup>1</sup> Pumping conditions shall be as defined in the standards of the Hydraulic Institute and are exclusive of losses through the pump casing. Pump Condition A determines the “firm” capacity of the pump station.
- <sup>2</sup> Motor horsepower rating shall not be exceeded over the range of operation summarized by Pumping Conditions A, B, and C.
- <sup>3</sup> Motors shall not exceed 80 dBA at 3 feet.

B. Pumps shall operate without cavitation or undue vibration under all conditions.

C. Provide pump and motor units which are listed for explosion proof Class I, Division 1, Group D hazardous location in air or submersible in water and sewage.

### 2.03 PUMP

A. General:

1. Submersible, wastewater pump, utilizing a semi-open impeller. The overall pump design shall combine high efficiency, low required NPSH, and the ability to handle raw sewage with rags and other fibrous material.
2. Sealing: All matting surfaces in pump casing and in motor housing shall be machined and fitted with Nitrile or Viton rubber O-rings for watertight seal.
3. The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor.

B. Impeller:

1. The impeller shall be of ASTM A532 25-percent chrome cast iron, semi-open, multi-vane, back swept, screw-shaped design. The leading edge shall be designed to be mechanically self-cleaned automatically upon each rotation. It shall be of one-piece construction, single suction, radial flow design for a circular flow pattern to prevent the accumulation of solids and stringy material.
2. Impeller shall be dynamically balanced and locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer static and dynamic balancing operations shall not deform or weaken the impeller. The arrangement shall be such that the impeller cannot be loosened from torque in either forward or reverse rotation.
3. Impeller shall be trimmed to specifically meet the conditions of operation.

C. Volute/Suction Cover:

1. The pump volute shall be a single piece gray cast iron, ASTM A48, Class 35B, non-concentric design with smooth passages.
2. Minimum inlet and discharge size shall be as specified.
3. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be of ASTM A532 25-percent chrome cast iron and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

D. Pump Shaft:

1. The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shafts using mechanical couplings shall not be acceptable. The shaft shall be stainless steel ASTM A479 S43100-T. Shaft sleeves will not be acceptable.
2. Sufficient diameter to carry the maximum loads imposed and to prevent vibration and fatigue.
3. Sufficient strength and stiffness to operate without distortion or vibration throughout the range of service specified.
4. Critical speeds of rotating assembly shall be in conformance with CRITICAL SPEED AND VIBRATION.
5. Capable of withstanding two times the expected peak motor torque from zero to maximum speed.
6. Dynamically balanced at maximum speed to 0.5 ounce inches per 10 pounds of shaft weight per end.

E. Materials of Construction:

1. Major Castings: Gray Cast Iron, ASTM 35B.
2. Pump Housing: Gray Cast Iron, ASTM 35B.
3. Impeller: Chrome Cast Iron, ASTM A532 (25 Percent).
4. Insert Ring: Chrome Cast Iron, ASTM A532 (25 Percent).
5. Shaft: Stainless Steel, ASTM A479 S43100-T.
6. Screws and Nuts: Stainless Steel, A4, AISI 316L, 316, 316Ti.
7. O-rings: Nitrile (NBR) or Viton (FKM) rubber.

**2.04 MOTOR**

- A. The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber.
- B. Designed, built, and tested in accordance with the latest revision of the following standards. In the case of conflict between the requirements of this section and those of the standards, the requirements of this section shall prevail.
  1. NEC.
  2. NEMA MG-1.
  3. ANSI/IEEE 112.
  4. UL 1004.
  5. UL 674.
- C. Provide submersible, FM approved, explosion-proof, air-filled motor suitable for continuous operation on 480 volts, 3-phase, 60 Hertz A.C.
- D. Design motor to be non-overloading throughout the pump capacity-head curve for constant speed pumps.
- E. Minimum Full Load Efficiency: 79 percent.
- F. Minimum Full Load Power Factor: 0.94.
- G. Minimum Service Factor: 1.15.
- H. Minimum Allowable Starts Per Hour: 15.
- I. Thrust Bearings: Designed to take the full axial load of the impeller.

- J. Dissipate excess heat directly from the exposed stator housing to surrounding pump liquid for adequate motor cooling at any continuous power output up to and including rated power in ambient of 40 degrees C. Cooling jackets are not allowed.
- K. Stator Windings and Leads: Insulated with moisture-resistant Class H (minimum) insulation for operation at temperatures up to 180 degrees C (minimum).
- L. Protection Devices:
  - 1. Provide three normally-closed, snap-action, bi-metallic, temperature actuated switches embedded in the stator windings (one per phase), wired in series that open a protective circuit if winding temperature exceeds rated operating temperature. These sensors automatically reset when winding temperature has cooled to a safe operating temperature.
  - 2. A float switch/moisture sensor shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50 percent chamber capacity, signaling the need to schedule an inspection.
  - 3. The thermal switches and float switch shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.

## **2.05 ELECTRICAL POWER CORD AND SENSOR CABLES**

- A. Provide 25 feet of extra hard usage, water resistant, 600 V, UL listed and FM approved power cord and sensor cable(s) for each pump with:
  - 1. Leak-proof, torque free seal at cable entry to motor.
  - 2. Sealing of the motor power cord and sensor cable(s) to prevent moisture entry into the motor due to wicking or capillary action through the cable.
  - 3. Corrosion-resistant cable supporting means.
  - 4. Free end of cable shall be sealed from moisture entry during shipping, storage, and prior to connection by a plastic sleeve securely clamped over the cable end.
  - 5. Cord shall be as follows:
    - a. Flexible cable, tear and abrasion resistant.
    - b. Oil and solvent resistant.
    - c. UL Listed and NEC rated for the application.

## **2.06 SHAFT SEALS**

- A. Independently-mounted, tandem mechanical seals contained in an oil chamber that is formed as an intrinsic part of the motor frame and allows the seals to be completely submerged in, and lubricated by, the oil bath.
- B. Mechanical seal nearest the bearing shall utilize silicone carbide/tungsten carbide faces, and shall isolate the seal cooling oil from the motor frame.
- C. Mechanical Seal Nearest the Impeller:
  - 1. Stainless steel or rubber bellows-type construction firmly attached to the rotating face and clamped to the shaft to prevent contaminants from contacting the stainless steel spring which loads the seal face.
  - 2. Seal Faces: Solid tungsten-carbide rotating face running against a solid silicon-carbide stationary face. Seals with both faces of similar materials, or seals with bonded, soldered, or converted face surfaces are not equal or acceptable.

## **2.07 BEARINGS**

- A. Bearings:
  - 1. Antifriction-type AFBMA standard sizes.
  - 2. Minimum (L-10) life of 50,000 hours.
  - 3. Motor bearings shall be sealed and permanently grease lubricated with high temperature grease.
  - 4. Thrust ratings not less than the combined static and dynamic loads imposed.

## **2.08 MOUNTING**

- A. Guide Rail System:
  - 1. 316L stainless steel dual guide rail fixture permanently mounted in the wet well as shown on the Drawings.
  - 2. Fixture shall cantilever the entire pump and motor from the volute discharge flange, providing an unobstructed sump floor under the pump.
  - 3. Support pump with a positive metal-to-metal interlocking flange that is sealed by a leak-proof nitrile rubber ring pressed against the fixture flange by the weight of the pump.
  - 4. A stainless steel upper rail guide bracket shall be furnished to support and align the rails at the top of the sump. For all rail lengths greater than 20 feet, a stainless steel intermediate rail guide bracket shall be included.

B. Discharge Base:

1. The installation shall include a rigid discharge base-elbow to support the total weight of the pumping unit.
2. The base is to be bolted directly to the floor with the 90-degree elbow having a 125-pound ANSI flange discharging vertically with mounts for two 316L stainless steel guide rails of standard schedule pipe.

## **2.09 LIFTING SYSTEM**

A. Provide components for using a grip eye to lift pumps.

1. Provide a minimum a full length of stainless steel lifting chain from each pump to the top of the guide rails.
2. Provide one grip eye for each pump.
3. All metal components shall be AISI Type 316 stainless steel and rated for lifting the weight of the pump with a safety factor of 2.0.

## **2.10 SHOP/FACTORY FINISHING**

- A. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

# **PART 3 – EXECUTION**

## **3.01 INSTALLATION**

- A. Install the pump as shown on the Drawings. Discharge elbow shall be mounted level. Follow manufacturer's recommendations to shim base plate as necessary to provide a level installation.
- B. Install guide rails as shown on the Drawings. Provide stainless steel upper attachment support as required and shown on the mechanical details. Coordinate dimensions with the pump manufacturer.
- C. Attach the lifting chain/rope to the side wall of the opening of the pump hatch above each pump. Lifting system attachment shall accommodate disassembly of the chain from the anchor to assist with removal of the pump. See Mechanical Drawings for detail.

## **3.02 FIELD QUALITY CONTROL**

- A. Installation Certification: A manufacturer's authorized representative shall inspect and test each pump for proper installation, lubrication, alignment, and connection. Submit written certification of installation to the Engineer (use form provided in Section 01 99 90, "Reference Forms", "Manufacturer's Installation Certification").

- B. Performance Testing: A manufacturer's authorized representative shall witness and assist with the performance testing of each pump to verify smooth operation and satisfactory performance. Hydraulic performance in the project wet well shall be adequate to demonstrate compliance with performance requirements.
- C. Pump Lift Test: Contractor must demonstrate successful removal of pump from wet well using manufacturer's guide rail.
- D. Test Results: Test results certified by the pump manufacturer's authorized representative shall be submitted to the Engineer for approval prior to the Owner's acceptance of the equipment.
- E. Coordination: All testing shall be coordinated with the Engineer, Owner, and installing contractor prior to conducting the tests.
- F. Should tests indicate an unsatisfactory operation, such as noise, leaks, poor pump performance, the manufacturer's representative shall assist the Contractor in diagnosing the conditions. The malfunction shall be corrected at no cost to the Owner and the tests repeated as defined herein.

### **3.03 MANUFACTURER'S SERVICES**

- A. Pump manufacturer shall provide a minimum of 10 hours of on-site service for certification of installation, start-up testing, and training. Training shall instruct operating personnel in the operation, maintenance, and adjustment of the system and installation.
- B. Manufacturer shall provide spare lubricants and oils as required for servicing of equipment.

### **END OF SECTION**



**SECTION 22 13 39**  
**CANNED VERTICAL TURBINE PUMPS**

**PART 1 – GENERAL**

**1.01 EQUIPMENT NUMBERS**

- A. MLR Pump 1: P-2100.
- B. MLR Pump 1&3: P-2150.
- C. MLR Pump 3: P-2175.

**1.02 SUMMARY**

- A. This section covers single- and multi-stage vertical, water lubricated, suspended, turbine pumps with a pump manufacturer-supplied steel can (barrel). Supply pump complete with can, pump bowl assembly, discharge column, shafting, discharge head, base plate, motor, and other appurtenances that are specified or required to meet the specified conditions and proper operation.
- B. The pump manufacturer shall warrant all equipment provided under this section whether or not it is manufactured by the pump manufacturer, so that there is one source for warranty and product service. Technicians specifically trained and certified by the manufacturer to support the product and employed by the pump supplier shall service the pumps and motors.
- C. Control Strategy: Pumps will be operated under process loop control to provide variable speed to match the flow requirements of the process. Pump Manufacturer does not provide any control elements.
- D. Balance, Critical Speed, and Vibration: The system shall be free of objectionable or destructive vibration throughout the operating range. Max peak-to-peak amplitude of vibration of installed unit under operating conditions equals 3 mils in any direction.
- E. Thrust: All components of the specified equipment shall be designed and sized for equipment weight plus the maximum hydraulic down thrust at all points on the pumping curve. Additionally, pumps shall be provided with drivers having a momentary up-thrust capacity equal to or exceeding 30 percent of the down-thrust rating.

**1.03 SUBMITTALS**

- A. Shop Drawings and product data prior to manufacture:
  - 1. Manufacturer, model, weight, and horsepower.
  - 2. Catalog information, descriptive literature, specifications, and identification of materials of construction.

3. Complete dimensional drawings of all equipment, including the steel can, vortex inhibiting devices, pumps, motors and drives, piping connections, pump base and mounting, installation details of equipment, and weights of all major components.
4. Complete dimensional drawing of barrel showing diameter, pump floor clearance, and depth below barrel inlet.
5. Manufacturer's published warranty documents.
6. Pump performance curves demonstrating compliance with the specified Pumping Conditions. Indicate all specified duty points and recommended limits of operation graphically on pump performance curves. Include curves for total head (feet), efficiency, brake horsepower, and net positive suction head required, each plotted against flow in gallons per minute (gpm).
7. Impeller type, size, and identification.
8. Motor Submittal Data:
  - a. Completed Motor Data Form.
  - b. Guaranteed minimum efficiency at rated load at rated voltage.
  - c. Guaranteed minimum power factor at rated load at rated voltage.
  - d. Expected efficiency at 1/2, 3/4, and full load at rated voltage.
  - e. Expected power factor at 1/2, 3/4, and full load at rated voltage.
  - f. Motor no-load current at rated voltage.
  - g. Full-load current at rated voltage.
  - h. Full-load current at 110 percent voltage.
  - i. Starting current at rated voltage.
  - j. Full-load speed.
  - k. Motor nameplate data.
  - l. Certified copy of test report for identical motor tested in accordance with NEMA MG 1 Part 31 and IEEE Standard 112, Test Method B.
  - m. Provide letter from motor manufacturer confirming motor is compatible with submitted VFD.
9. Factory finishing system.
10. Mechanical seal information.
11. Weight of each pump.

12. Size and template for anchor bolts for discharge elbows.
13. Certificate of compliance with ISO 9001 Quality System.
14. Complete installation instructions.
15. Procedure for factory testing.
16. Confirmation letter from motor manufacturer confirming the submitted motor is compatible with the submitted VFD.

B. Prior to shipment to jobsite:

1. Operations and Maintenance Manuals.
2. Field testing procedure.
3. Certified factory test results:
  - a. Hydrostatic
  - b. Performance.
  - c. Proof-testing of can.

C. Closeout Submittals:

1. Manufacturer's Certificate of Proper Installation.
2. Certified field test results.
3. Spare parts.

#### **1.04 QUALITY ASSURANCE**

- A. Unit Responsibility: In order to ensure coordination, all pumps, motors, power cable, steel can, bearings, shaft, couplings, motor frame support, and accessories shall be supplied by one pump manufacturer.
- B. The pumps specified are intended to be standard pumping equipment, as modified by this section, of proven ability as manufactured by a single manufacturer, having a minimum of ten years of experience in the production of such pumps. The pumps furnished shall include cans, where applicable, and shall be designed, constructed and installed in accordance with the standards and methods of the Hydraulic Institute, and shall operate satisfactorily when installed as shown on the Drawings and specified herein.
- C. All pumping equipment furnished under this section shall be of a design and manufacture that has been used in similar applications and it shall be demonstrated as such to the satisfaction of the Owner.
- D. To ensure a consistent high standard of quality, the manufacturer of this pumping equipment shall comply with the requirements of the ISO 9001 Quality System, and such

compliance shall be verified by an independent certification agency approved by the International Organization for Standardization. Documentation shall be submitted for approval showing compliance with this requirement, and the equipment will not be released for shipment until approved.

- E. Coordination: Ensure the pump manufacturer adequately communicates with the variable frequency drive supplier to produce a system that functions as specified herein.

#### **1.05 SPARE PARTS**

- A. Provide one set of the manufacturer's recommended spare parts kit. The spare parts kit shall, at a minimum, include the following:
  - 1. Inner and outer mechanical seals.
  - 2. Upper and lower bearings.
  - 3. One set of special tools for pump maintenance, if applicable.

#### **1.06 SOURCE QUALITY CONTROL**

- A. Each pump shall be factory tested and certified test results submitted prior to shipment of pumps. The Owner and Engineer shall be given notice of the factory pump testing a minimum of 14 days in advance of testing.
  - 1. Impeller, motor rating, and electrical connections shall be checked for compliance to the Specifications.
  - 2. Hydrostatic Testing: Each shall be hydrostatically tested that conforms to the most recent Hydraulic Institute Standards test procedures in ANSI/HI 14.6. The hydrostatic test shall be held for at least 15 minutes. At no time during the test shall the casing show undue deflection or signs of weakness at any point, nor shall the casing show sweating through porous metal or leaking through cracks or other defects.
  - 3. Performance Testing: Each pump shall be operationally tested to demonstrate compliance with performance requirements. The pumps shall be tested at full speed with the minimum water depth specified. A minimum of eight test points shall be plotted on the full speed pump curve showing horsepower, efficiency, and head and flow from shut-off head to the specified run out condition plus 20 percent. Reduced speed performance criteria may be demonstrated by applying the affinity laws to the full speed test curve. During the testing, each pump shall be run continuously for a minimum of 30 minutes. Performance testing shall conform to the most recent Hydraulic Institute Standards test procedures, ANSI/HI 14.6, Acceptance Grade 1U.
  - 4. Tabulated and graphical test results shall be certified by the manufacturer and submitted for approval by the Engineer prior to shipment of the pumps.

#### **1.07 WARRANTY**

- A. The pump manufacturer shall warranty the complete pump assembly and appurtenances from the date of commissioning against defects in materials and workmanship for a period of 12 months, not to exceed 18 months from the date of shipment.

- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

## **1.08 PROTECTION**

- A. Box, crate, or otherwise completely enclose and protect all equipment during shipment, handling, and storage.
- B. Protect equipment from exposure to elements and keep all items thoroughly dry at all times.
- C. Store motors, electrical equipment, and other equipment with moving parts in weathertight warehouses at a maintained temperature of 60 degrees F minimum.
- D. Painted Surfaces: Protect against impact, abrasion, discoloration, and other damage.
- E. Protect electrical equipment, controls, and insulation against moisture or water damage.

## **1.09 CRITICAL SPEED AND VIBRATION**

- A. Each complete pump assembly shall have no critical or resonant frequencies or multiples of resonant frequencies within 30 percent above and 30 percent below the range of pump speeds and blade pass frequencies required to meet the Performance Requirements. Complete assemblies shall be free of objectionable or destructive vibration throughout the specified operating range.
- B. Vibration levels shall comply with the most recent edition of the Hydraulic Institute Standards.
- C. Verify that equipment is mutually compatible and free of resonance over the complete operating range.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS AND PRODUCTS**

- A. Canned Vertical Turbine Pumps:
  - 1. Fairbanks Nijuis vertical turbine pumps, standard fitted construction, includes 11H single stage bowl assembly, 8-inch flanged column, 8-inch flanged discharge head, 16-inch suction can, enclosed line shaft assembly, dynamic balance, 5 hp, 1,150 rpm, 460 volt, 3-phase, premium efficiency, VSS, TEFC motor. Built to match existing pump serial 483670.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Pumps Guaranteed Performance:
  - 1. Pumping Condition A<sup>1</sup> – Rated Capacity at Full Speed:
    - a. Capacity: 868 gpm.
    - b. Total Head: 12 feet.

- c. Minimum Hydraulic Efficiency: 79 percent.
  - d. Approximate Pump Speed: 1,160 rpm.
- 2. Pumping Condition B<sup>1</sup> – Run Out at Full Speed:
  - a. Capacity: 1,100 gpm
  - b. Total Head: 6 feet.
  - c. Approximate Pump Speed: 1,160 rpm.
- 3. Pumping Condition C<sup>1</sup> – High Head at Full Speed:
  - a. Capacity: 400 gpm
  - b. Total Head: 20 feet.
  - c. Approximate Pump Speed: 1,160 rpm.
- 4. Pumping Condition D<sup>1</sup> – Reduced Speed:
  - a. Capacity: 300 gpm
  - b. Total Head: 5 feet.
  - c. Approximate Pump Speed: 585 rpm.
- 5. Minimum Shut-Off Head: 23 feet.
- 6. Minimum Hydraulic Efficiency at Best Efficiency Point: 79 percent.
- 7. Minimum Non-compressible Solids Passage: 0.88 inches.
- 8. Motor: 5 horsepower<sup>2,3</sup>.
- 9. Minimum Suction Diameter: 10 inches.
- 10. Minimum Discharge Diameter: 8 inches.

#### **NOTES**

- <sup>1</sup> Pumping conditions shall be as defined in the standards of the Hydraulic Institute and are exclusive of losses through the pump casing.
- <sup>2</sup> Motor horsepower rating shall not be exceeded over the range of operation summarized by Pumping Conditions A, B, and C.
- <sup>3</sup> Motors shall not exceed 80 dBA at 3 feet.

B. Pumps shall operate without cavitation or undue vibration under all conditions.

## **2.03 GENERAL**

- A. The pumps and motors shall be designed and built for 24-hour continuous service at any and all points within the required range of operation, without overheating, without cavitation, and without excessive vibration or strain. All parts shall be so designed and proportioned as to have liberal strength, stability, and stiffness and to be especially constructed to meet the specified requirements. Ample room and facilities shall be provided for inspection, repairs, and adjustment.
- B. The equipment, including pump bases, shall be anchored into position, and all necessary foundation bolts, plates, nuts, and washers shall be furnished and installed by the Contractor. Anchor bolts shall be of Type 316 stainless steel unless otherwise specified. Pumps and pump bases shall have suitable provisions to collect leakage and permit it to be drained away.
- C. Stainless steel nameplates, giving the name of the manufacturer, model number, and serial number, and other pertinent data shall be attached to each item of equipment.
  - 1. Pump nameplates shall also include capacity, total dynamic head, speed, and any other pertinent information.
  - 2. Motor nameplates shall also include horsepower, speed, voltage, amperes, number of cycles, power and service factor, and any other pertinent data.
- D. The pump shall have a rising head capacity curve for stable pump operation from the design operating point to the shut-off head.
- E. The pump shall operate throughout the entire operating range, within the vibration limitations specified by the Hydraulic Institute.
- F. Pumps shall be identical in every respect, except for serial number, with all parts interchangeable.

## **2.04 PUMP CONSTRUCTION**

- A. Pumps shall be self-lubricated, completely equipped with motor support and guide bearings or bushings and shall conform to AWWA E101, Vertical Turbine Pumps, where not in conflict with the specific requirements contained herein.
- B. Pump bowls, including suction bell, shall be ASTM A48 Class 30 cast iron, flanged, and bolted construction with combination bronze bearings. All bowl hardware shall be Type 316 stainless steel. Pump bowls shall be coated inside with powdered epoxy (bowls 18-inch nominal size or larger) or NSF 61 approved epoxy (bowls smaller than 18-inch nominal size).
- C. Each impeller shall be cast bronze, ASTM B584, Alloy C83600 enclosed type, statically and dynamically balanced and complete with bronze wear ring.
- D. Impeller shafts and couplings shall be Type 416 stainless steel. Collets, locknuts, keys, snap-rings and other impeller fastening hardware shall be Type 316 stainless steel.

- E. Line shafts and couplings shall be Type 416 stainless steel and shall be field replaceable. Maximum shaft lengths shall be five (5) feet.
- F. The pump line-shaft and top shaft each shall be one piece solid shaft construction with self-tightening threaded connecting stainless steel couplings. The motor shall incorporate a non-reverse ratchet. The pump and VSS motor shall be joined with an adjustable spacer type shaft coupling located above the stuffing box and positioned to be easily removable through the discharge head openings.
- G. Discharge columns shall be steel of flanged and bolted construction in lengths not exceeding five feet. All flange hardware shall be Type 316 stainless steel. The minimum wall thickness on all columns shall be 0.25-in.
- H. Discharge Heads:
  - 1. General discharge heads with integral base plate shall be fabricated steel with 150-pound ANSI drilling. Provide threaded drain connection and prelubricating water connection (if necessary by the pump being furnished) and provide 1-inch threaded outlets with plugs at the side and top of the discharge nozzle. Pump seal shall be a cartridge type Chesterton 155 type, or equal. Seal shall be accessible above the pump base plate and shall be flushed with Piping Plan 13. The top of the discharge head shall have a registered fit for mounting the driving motor.
  - 2. The bottom of the base plate shall be machined to mate with the top flange of the pump can furnished by the pump manufacturer or with the sole plate.
- I. Line shaft bearings shall be removable self-flushing rubber type, mounted in cast bronze bearing retainers located at discharge column flanges on 5-foot centers.
- J. Pump Cans:
  - 1. The cans shall be constructed of ASTM A53, Grade B steel with minimum wall thickness of 0.25 inch. The diameter and length of the cans shall be in accordance with the Hydraulic Institute Standards for Pump Intake Design (ANSI/HI 9.8-latest edition) as selected by the pump manufacturer to ensure proper delivery of flow into the first stage impeller. The water inlet connection to the suction shall be at the elevation and of the diameter shown on the Drawings.
  - 2. The top flange shall be welded to the can, drilled, and tapped for studs to provide a suitable connection for the discharge head. This flange shall extend beyond the can diameter to serve as a rectangular supporting sole plate to support the weight of the entire assembled pumping unit. The flange shall be secured to the concrete pump can encasement with anchor bolts, as required, and shall be grouted for solid support. The size and thickness of the supporting sole plate shall be determined by the pump manufacturer.
  - 3. Cans shall be fabricated with interior flow straightening vanes and vortex suppression devices along their sides and below the pump bells, as required, for proper flow delivery into the pump impellers.



- K. The construction of the pumps, position, and number of column pipe flanges shall be such that the pumps can be readily installed and removed for repairs within the facility limitations using normal methods of operation and handling without undue difficulties.
- L. The natural frequency of the assembled pump and its supporting structure shall be at least 25 percent higher than the maximum pump speed.
- M. The pump shall be capable of routine temporary operation at and near shut off head for up to 30 seconds each time as the pump starts and stops.

## **2.05 MOTOR**

- A. The pump motor shall be inverter duty rated, vertical, TEFC, suitable for variable speed operation on variable frequency drives. Motor rating and speed to meet pump requirements.
- B. Designed, built, and tested in accordance with the latest revision of the following standards. In the case of conflict between the requirements of this section and those of the standards, the requirements of this section shall prevail.
  - 1. NEC.
  - 2. NEMA MG-1.
  - 3. ANSI/IEEE 112.
  - 4. UL 1004.
  - 5. UL 674.
- C. Motors shall be 480 volts, 3-phase, 60 Hertz A.C, NEMA Class B, Class F insulation.
- D. Motor shall be vertical, solid shaft.
- E. Provide definite-purpose inverter-fed duty rating per NEMA MG-1 Part 31 requirements. The motor nameplate shall indicate that the motor is rated for inverter duty per NEMA MG-1 Part 31.
- F. Minimum Full Load Efficiency: 93.5 percent.
- G. Minimum Full Load Power Factor: 0.94.
- H. Minimum Service Factor: 1.15.
- I. Minimum Allowable Starts Per Hour: 15.
- J. Thrust Bearings: Designed to take the full axial load of the impeller.
- K. Oversized and rotatable conduit box.

## **2.06 VARIABLE FREQUENCY DRIVES**

- A. As specified in the electrical specifications and is not provided by pump manufacturer.
- B. Contractor shall coordinate pumps and motors with variable frequency drives to ensure compatibility of the complete system. Provide letter from motor manufacturer confirming motor is compatible with submitted VFD.

## **2.07 BEARINGS**

- A. Bearings:
  - 1. Antifriction-type AFBMA standard sizes.
  - 2. Minimum (L-10) life of 50,000 hours.
  - 3. Motor bearings shall be sealed and permanently grease lubricated with high temperature grease.
  - 4. Thrust ratings not less than the combined static and dynamic loads imposed.

## **2.08 SHOP/FACTORY FINISHING**

- A. All metal surfaces, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

# **PART 3 – EXECUTION**

## **3.01 PREPARATION**

- A. Pumps shall be installed in accordance with the manufacturer's written instructions and recommendations and as shown on the Drawings. Installation shall include furnishing all grease and oil required for initial operation. All piping connections shall be made in a neat and leak-free manner.
- B. Take all necessary measurements in the field to determine the exact dimensions for all Work and the required sizes of all equipment under this Contract. All pertinent data and dimensions shall be verified.
- C. Install the recommended lubrication for normal operation prior to final testing.
- D. If required for any pump furnished, install copper seal water supply and drain piping, filters, pressure reducing valves, etc.

## **3.02 INSTALLATION**

- A. Install the pump in strict accordance with the manufacturer's instruction and recommendation and as shown on the Drawings.

### **3.03 FIELD QUALITY CONTROL**

- A. Installation Certification: A manufacturer's authorized representative shall inspect and test each pump for proper installation, lubrication, alignment, and connection. Submit written certification of installation to the Engineer (use form provided in Section 01 99 90, "Reference Forms").
- B. Performance Testing: A manufacturer's authorized representative shall witness and assist with the performance testing of each pump to verify smooth operation and satisfactory performance. Hydraulic performance in the project wet well shall be adequate to demonstrate compliance with performance requirements.
  - 1. Contractor shall provide pressure gauges, isolation valves, and associated piping on suction and discharge side of discharge head for performance testing. Pressure gauges shall be provided to Owner after Performance Testing is complete.
- C. Vibration Testing: A manufacturer's authorized representative shall conduct vibration testing to ensure conformance with the Hydraulic Institute Standards. Maximum allowable vibrations shall not exceed the maximum peak-to-peak amplitude as set forth in the Hydraulic Institute Standards latest edition. The actual natural frequency of the installed pumping units shall be verified using industry accepted procedures.
- D. Test Results: Test results certified by the pump manufacturer's authorized representative shall be submitted to the Engineer for approval prior to the Owner's acceptance of the equipment.
- E. Coordination: All testing shall be coordinated with the Engineer, Owner, and installing contractor prior to conducting the tests.
- F. Should tests indicate an unsatisfactory operation, such as noise, leaks, poor pump performance, the manufacturer's representative shall assist the Contractor in diagnosing the conditions. The malfunction shall be corrected at no cost to the Owner and the tests repeated as defined herein.

### **3.04 MANUFACTURER'S SERVICES**

- A. Pump manufacturer shall provide a minimum of 10 hours of on-site service for certification of installation, start-up testing, and training. Training shall instruct operating personnel in the operation, maintenance, and adjustment of the system and installation.
- B. Manufacturer shall provide spare lubricants and oils as required for servicing of equipment.

### **END OF SECTION**

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**SECTION 22 13 49**  
**PERMEATE PUMPS**

**PART 1 – GENERAL**

**1.01 EQUIPMENT NUMBERS**

- A. MBR Permeate Pump 1: P-2540.
- B. MBR Permeate Pump 2: P-2440.
- C. MBR Permeate Pump 3: P-2740.
- D. MBR Permeate Pump 4: P-2640.

**1.02 SUMMARY**

- A. This section covers self-priming pumps designed to handle MBR effluent permeate. Supply pump complete with base plate, motor, and other appurtenances that are specified or required to meet the specified conditions and proper operation.
- B. The pump manufacturer shall warrant all equipment provided under this section whether or not it is manufactured by the pump manufacturer so that there is one source for warranty and product service. Technicians specifically trained and certified by the manufacturer to support the product and employed by the pump supplier shall service the pumps and motors.
- C. Control Strategy: Pumps will be operated under process loop control to provide variable speed to match the flow requirements of the process. Pump Manufacturer does not provide any control elements.
- D. Balance, Critical Speed, and Vibration: The system shall be free of objectionable or destructive vibration throughout the operating range. Max peak-to-peak amplitude of vibration of installed unit under operating conditions equals 3 mils in any direction.
- E. Thrust: All components of the specified equipment shall be designed and sized for equipment weight plus the maximum hydraulic down thrust at all points on the pumping curve. Additionally, pumps shall be provided with drivers having a momentary up-thrust capacity equal to or exceeding 30 percent of the down-thrust rating.

**1.03 SUBMITTALS**

- A. Shop Drawings and product data prior to manufacture:
  - 1. Manufacturer, model, weight, and horsepower.
  - 2. Catalog information, descriptive literature, specifications, and identification of materials of construction.
  - 3. Complete dimensional drawings of all equipment, pumps, motors and drives, piping connections, pump base and mounting, installation details of equipment, and weights of all major components.

4. Manufacturer's published warranty documents.
5. Pump performance curves demonstrating compliance with the specified Pumping Conditions. Indicate all specified duty points and recommended limits of operation graphically on pump performance curves. Include curves for total head (feet), efficiency, brake horsepower, and net positive suction head required, each plotted against flow in gallons per minute (gpm).
6. Impeller type, size, and identification.
7. Motor Submittal Data:
  - a. Completed Motor Data Form.
  - b. Guaranteed minimum efficiency at rated load at rated voltage.
  - c. Guaranteed minimum power factor at rated load at rated voltage.
  - d. Expected efficiency at 1/2, 3/4, and full load at rated voltage.
  - e. Expected power factor at 1/2, 3/4, and full load at rated voltage.
  - f. Motor no-load current at rated voltage.
  - g. Full-load current at rated voltage.
  - h. Full-load current at 110 percent voltage.
  - i. Starting current at rated voltage.
  - j. Full-load speed.
  - k. Motor nameplate data.
  - l. Certified copy of test report for identical motor tested in accordance with NEMA MG 1 Part 31 and IEEE Standard 112, Test Method B.
    - a. Provide letter from motor manufacturer confirming motor is compatible with submitted VFD.
8. Factory finishing system.
9. Mechanical seal information.
10. Weight of each pump.
11. Size and template for anchor bolts for discharge elbows.
12. Certificate of compliance with ISO 9001 Quality System.
13. Complete installation instructions.

14. Procedure for factory testing.

15. Confirmation letter from the motor manufacturer confirming the submitted motor is compatible with the submitted VFD.

B. Prior to shipment to jobsite:

1. Operations and Maintenance Manuals.

2. Field testing procedure.

3. Certified factory test results:

a. Hydrostatic

b. Performance.

4. Closeout Submittals:

a. Manufacturer's Certificate of Proper Installation.

b. Certified field test results.

c. Spare parts.

#### **1.04 QUALITY ASSURANCE**

A. Unit Responsibility: In order to ensure coordination, all pumps, motors, power cable, steel can, bearings, shaft, couplings, motor frame support, and accessories shall be supplied by one pump manufacturer.

B. The pumps specified are intended to be standard pumping equipment, as modified by this section, of proven ability as manufactured by a single manufacturer, having a minimum of ten years of experience in the production of such pumps. The pumps furnished shall include cans, where applicable, and shall be designed, constructed and installed in accordance with the standards and methods of the Hydraulic Institute, and shall operate satisfactorily when installed as shown on the Drawings and specified herein.

C. All pumping equipment furnished under this section shall be of a design and manufacture that has been used in similar applications and it shall be demonstrated as such to the satisfaction of the Owner.

D. To ensure a consistent high standard of quality, the manufacturer of this pumping equipment shall comply with the requirements of the ISO 9001 Quality System, and such compliance shall be verified by an independent certification agency approved by the International Organization for Standardization. Documentation shall be submitted for approval showing compliance with this requirement, and the equipment will not be released for shipment until approved.

E. Coordination: Ensure the pump manufacturer adequately communicates with the variable frequency drive supplier to produce a system that functions as specified herein.

### **1.05 SPARE PARTS**

- A. Provide one set of the manufacturer's recommended spare parts kit. The spare parts kit shall, at a minimum, include the following:
  - 1. Inner and outer mechanical seals.
  - 2. Upper and lower bearings.
  - 3. One set of special tools for pump maintenance, if applicable.

### **1.06 SOURCE QUALITY CONTROL**

- A. Each pump shall be factory tested and certified test results submitted prior to shipment of pumps. The Owner and Engineer shall be given notice of the factory pump testing a minimum of 14 days in advance of testing.
  - 1. Impeller, motor rating, and electrical connections shall be checked for compliance to the Specifications.
  - 2. Hydrostatic Testing: Each shall be hydrostatically tested that conforms to the most recent Hydraulic Institute Standards test procedures in ANSI/HI 14.6. The hydrostatic test shall be held for at least 15 minutes. At no time during the test shall the casing show undue deflection or signs of weakness at any point, nor shall the casing show sweating through porous metal or leaking through cracks or other defects.
  - 3. Performance Testing: Each pump shall be operationally tested to demonstrate compliance with performance requirements. The pumps shall be tested at full speed with the minimum water depth specified. A minimum of eight test points shall be plotted on the full speed pump curve showing horsepower, efficiency, and head and flow from shut-off head to the specified run out condition plus 20 percent. Reduced speed performance criteria may be demonstrated by applying the affinity laws to the full speed test curve. During the testing, each pump shall be run continuously for a minimum of 30 minutes. Performance testing shall conform to the most recent Hydraulic Institute Standards test procedures, ANSI/HI 14.6, Acceptance Grade 1U.
  - 4. Tabulated and graphical test results shall be certified by the manufacturer and submitted for approval by the Engineer prior to shipment of the pumps.

### **1.07 WARRANTY**

- A. The pump manufacturer shall warranty the complete pump assembly and appurtenances from the date of commissioning against defects in materials and workmanship for a period of 60 months.
- B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.



## **1.08 PROTECTION**

- A. Box, crate, or otherwise completely enclose and protect all equipment during shipment, handling, and storage.
- B. Protect equipment from exposure to elements and keep all items thoroughly dry at all times.
- C. Store motors, electrical equipment, and other equipment with moving parts in weathertight warehouses at a maintained temperature of 60 degrees F minimum.
- D. Painted Surfaces: Protect against impact, abrasion, discoloration, and other damage.
- E. Protect electrical equipment, controls, and insulation against moisture or water damage.

## **1.09 CRITICAL SPEED AND VIBRATION**

- A. Each complete pump assembly shall have no critical or resonant frequencies or multiples of resonant frequencies within 30 percent above and 30 percent below the range of pump speeds and blade pass frequencies required to meet the Performance Requirements. Complete assemblies shall be free of objectionable or destructive vibration throughout the specified operating range.
- B. Vibration levels shall comply with the most recent edition of the Hydraulic Institute Standards.
- C. Verify that equipment is mutually compatible and free of resonance over the complete operating range.

## **PRODUCTS**

### **2.01 MANUFACTURER**

- A. Permeate Pumps:
  - 1. Gorman Rupp model T6A3S-B, 6" self-priming pump, standard fitted construction, oil lube bearing and oil lube mechanical seal, automatic air release valve, v-belt drive, base and guard.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Pumps Guaranteed Performance:
  - 1. Pumping Condition A<sup>1</sup> – Rated Capacity at Full Speed:
    - a. Capacity: 540 gpm.
    - b. Total Head: 15 feet.

- c. Minimum Hydraulic Efficiency: 57 percent.
  - d. Approximate Pump Speed: 660 rpm.
- 2. Pumping Condition B<sup>1</sup> – Run Out at Full Speed:
  - a. Capacity: 650 gpm.
  - b. Total Head: 10 feet.
  - c. Approximate Pump Speed: 660 rpm.
- 3. Pumping Condition C<sup>1</sup> – High Head at Full Speed:
  - a. Capacity: 200 gpm.
  - b. Total Head: 19 feet.
  - c. Approximate Pump Speed: 660 rpm.
- 4. Pumping Condition D<sup>1</sup> – Reduced Speed:
  - a. Capacity: 540 gpm.
  - b. Total Head: 7 feet.
  - c. Approximate Pump Speed: 550 rpm.
- 5. Minimum Shut-Off Head: 22 feet.
- 6. Minimum Hydraulic Efficiency at Best Efficiency Point: 57 percent.
- 7. Minimum Non-compressible Solids Passage: 3.0 inches.
- 8. Motor: 5 horsepower<sup>2,3</sup>.
- 9. Minimum Suction Diameter: 6 inches.
- 10. Minimum Discharge Diameter: 6 inches.

#### **NOTES**

- <sup>1</sup> Pumping conditions shall be as defined in the standards of the Hydraulic Institute and are exclusive of losses through the pump casing.
- <sup>2</sup> Motor horsepower rating shall not be exceeded over the range of operation summarized by Pumping Conditions A, B, and C.
- <sup>3</sup> Motors shall not exceed 80 dBA at 3 feet.

B. Pumps shall operate without cavitation or undue vibration under all conditions.

## **2.03 GENERAL**

- A. The pumps and motors shall be designed and built for 24-hour continuous service at any and all points within the required range of operation, without overheating, without cavitation, and without excessive vibration or strain. All parts shall be so designed and proportioned as to have liberal strength, stability, and stiffness and to be especially constructed to meet the specified requirements. Ample room and facilities shall be provided for inspection, repairs, and adjustment.
- B. The equipment, including pump bases, shall be anchored into position, and all necessary foundation bolts, plates, nuts, and washers shall be furnished and installed by the Contractor. Anchor bolts shall be of Type 316 stainless steel unless otherwise specified. Pumps and pump bases shall have suitable provisions to collect leakage and permit it to be drained away.
- C. Stainless steel nameplates, giving the name of the manufacturer, model number, and serial number, and other pertinent data shall be attached to each item of equipment.
  - 1. Pump nameplates shall also include capacity, total dynamic head, speed, and any other pertinent information.
  - 2. Motor nameplates shall also include horsepower, speed, voltage, amperes, number of cycles, power and service factor, and any other pertinent data.
- D. The pump shall have a rising head capacity curve for stable pump operation from the design operating point to the shut-off head.
- E. The pump shall operate throughout the entire operating range, within the vibration limitations specified by the Hydraulic Institute.
- F. Pumps shall be identical in every respect, except for the serial number, with all parts interchangeable.

## **2.04 PUMP CONSTRUCTION**

- A. Pumps shall be horizontal, self-priming centrifugal type, designed specifically for handling raw, unscreened, domestic sanitary sewage.
- B. The pump manufacturer must be ISO 9001:2008 revision certified, with scope of registration including design control and service after sales activities.
- C. Materials and Construction Features:
  - 1. Pump casing shall be cast iron Class 30 with integral volute scroll. Casing shall incorporate following features:
    - a. Mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance.
    - b. Fill port cover plate, 3-1/2-inch diameter, shall be opened after loosening a hand nut/clamp bar assembly. In consideration for safety, hand nut threads must provide

slow release of pressure, and the clamp bar shall be retained by detente lugs. A Teflon gasket shall prevent adhesion of the fill port cover to the casing.

- c. Casing drain plug shall be at least 1-1/4-inch NPT to insure complete and rapid draining.
  - d. Liquid volume and recirculation port design shall be consistent with performance criteria listed in this section.
2. Cover plate assembly shall be cast iron Class 30. Design must incorporate following maintenance features:
- a. A lightweight inspection cover plate, retained by acorn nuts, for access to pump interior for removal of stoppages. Designs that require removal of complete cover plate assembly for access to the impeller will not be accepted.
  - b. Retained by acorn nuts for complete access to pump interior. Back cover plate removal must allow service to the impeller, seal, wear plate or check valve without removing suction or discharge piping. Back cover plate shall incorporate an obstruction free flow path by combining four support posts into a two-point "webbed" plate design for increased durability, reduced clogging, and increased operational efficiency.
  - c. Aggressive Self-Cleaning Wear Plate:
    - 1) A replaceable wear plate secured to the back cover plate by studs and nuts. Wear plate shall be self-cleaning design ensuring that debris is cleared away and does not collect on the impeller vanes.
    - 2) The nature of the conveyed medium poses significant challenges to the continuous operation of the pump. Of particular concern is the clogging of the impeller by debris in the pumped medium including but not limited to long rags, fibers, and like debris which are able to wrap around the impeller vanes, stick to the center of the vanes or hub, or lodge within the spaces between the impeller and the housing.
    - 3) The aggressive self-cleaning wear plate shall have integral laser cut notches and grooves in combination with a "tooth" designed to disturb and dislodge any solids which might otherwise remain on the impeller in dynamic operation. Wear plate is designed to constantly and effectively clear the eye of the impeller without the use of blades or cutters.
  - d. One O-ring of Buna-N material shall seal inspection cover plate to back cover plate.
  - e. Two O-rings of Buna-N material shall seal back cover plate to pump casing.
  - f. Pusher bolt capability to assist in removal of inspection cover plate or back cover plate. Pusher bolt threaded holes shall be sized to accept same retaining caps crews as used in rotating assembly.
  - g. Easy-grip handle shall be mounted to face of inspection cover plate.

3. Rotating assembly, which includes impeller, shaft, mechanical shaft seal, lip seals, bearings, seal plate and bearing housing, must be removable as a single unit without disturbing the pump casing or piping. Design shall incorporate following features:
  - a. Seal plate and bearing housing shall be cast iron Class 30. Separate oil filled cavities, vented to atmosphere, shall be provided for shaft seal and bearings. Cavities must be cooled by the liquid pumped. Three lip seals will prevent leakage of oil.
    - 1) The bearing cavity shall have an oil level sight gauge and fill plug check valve. The clear sight gauge shall provide easy monitoring of the bearing cavity oil level and condition of oil without removal of the fill plug check valve. The check valve shall vent the cavity but prevent introduction of moist air to the bearings.
    - 2) The seal cavity shall have an oil level sight gauge and fill/vent plug. The clear sight gauge shall provide easy monitoring of the seal cavity oil level and condition of oil without removal of the fill/vent plug.
    - 3) Double lip seal shall provide an atmospheric path providing positive protection of bearings, with capability for external drainage monitoring.
  - b. Impeller shall be ductile iron, two-vane, semi-open, non-clog, with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lock screw and conical washer.
  - c. Shaft shall be AISI 4140 alloy steel.
  - d. Bearings shall be anti-friction ball type of proper size and design to withstand all radial and thrust loads expected during normal operation. Bearings shall be oil lubricated from a dedicated reservoir. Pump designs which use the same oil to lubricate the bearings and shaft seal shall not be acceptable.
  - e. Shaft seal shall be cartridge oil lubricated mechanical type. The stationary and rotating seal faces shall be tungsten titanium carbide alloy. Each mating surface shall be lapped to within three light bands flatness (35 millionths of an inch), as measured by an optical flat under monochromatic light. The stationary seal seat shall be double floating by virtue of a dual O-ring design; an external O-ring secures the stationary seat to the seal plate, and an internal O-ring holds the faces in alignment during periods of mechanical or hydraulic shock (loads which cause shaft deflection, vibration, and axial/radial movement). Elastomers shall be viton; cage and spring to be stainless steel. Seal shall be oil lubricated from a dedicated reservoir. The same oil shall not lubricate both shaft seal and shaft bearings.
  - f. Pusher bolt capability to assist in removal of rotating assembly. Pusher bolt threaded holes shall be sized to accept same caps crews as used for retaining rotating assembly.
4. Adjustment of the impeller face clearance (distance between impeller and wearplate) shall be accomplished by external means.
  - a. Clearances shall be maintained by a four-point external shimless cover plate adjustment system, utilizing a four collar and four adjusting screw design allowing

for incremental adjustment of clearances by hand as required. Each of the four points shall be lockable to prevent inadvertent clearance increases or decreases due to equipment vibration or accidental operator contact. The four-point system also allows for equal clearance gaps at all points between the impeller and wear plate. Requirement of realignment of belts, couplings, etc., shall not be acceptable. Coverplate shall be capable of being removed without disturbing clearance settings. Clearance adjustment systems that utilize less than four points will not be considered.

- b. There shall be provisions for additional clearance adjustment in the event that adjustment tolerances have been depleted from the cover plate side of the pump. The removal of stainless steel shims from the rotating assembly side of the pump shall allow for further adjustment as described above
  - c. Clearance adjustment which requires movement of the shaft only, thereby adversely affecting seal working length or impeller back clearance, shall not be acceptable.
- 5. Suction check valve shall be molded Neoprene with integral steel and nylon reinforcement. A blow-out center shall protect pump casing from hydraulic shock or excessive pressure. Removal or installation of the check valve must be accomplished through the cover plate opening, without disturbing the suction piping. Sole function of check valve shall be to save energy by eliminating need to reprime after each pumping cycle. Pumps requiring a suction check valve to assist reprime will not be acceptable.
  - 6. Spool flanges shall be one-piece cast iron, class 30 fitted to suction and/or discharge ports. Each spool shall have one 1-1/4-inch NPT and one 1/4-inch NPT tapped hole with pipe plugs for mounting gauges or other equipment.
    - a. Contractor shall provide pressure gauges, isolation valve, and associated piping on suction and discharge side of discharge head for performance testing. Pressure gauges shall be provided to Owner after Performance Testing is complete.

## **2.05 MOTOR**

- A. The pump motor shall be inverter duty rated, horizontal, TEFC, suitable for variable speed operation on variable frequency drives. Motor rating and speed to meet pump requirements.
- B. Designed, built, and tested in accordance with the latest revision of the following standards. In the case of conflict between the requirements of this section and those of the standards, the requirements of this section shall prevail.
  - 1. NEC.
  - 2. NEMA MG-1.
  - 3. ANSI/IEEE 112.
  - 4. UL 1004.
  - 5. UL 674.

- C. Motors shall be 480 volts, 3-phase, 60 Hertz A.C, NEMA Class B, Class F insulation.
- D. Motors shall be tested in accordance with provisions of ANSI/IEEE Std. 112, Method B.
- E. Provide definite-purpose inverter-fed duty rating per NEMA MG-1 Part 31 requirements. The motor nameplate shall indicate that the motor is rated for inverter duty per NEMA MG-1 Part 31.
- F. Minimum Full Load Efficiency: 93.5 percent.
- G. Minimum Full Load Power Factor: 0.94.
- H. Minimum Service Factor: 1.15.
- I. Minimum Allowable Starts Per Hour: 15.
- J. Thrust Bearings: Designed to take the full axial load of the impeller.
- K. Oversized and rotatable conduit box.

## **2.06 VARIABLE FREQUENCY DRIVES**

- A. As specified in the electrical specifications and is not provided by pump manufacturer.
- B. Contractor shall coordinate pumps and motors with variable frequency drives to ensure compatibility of the complete system. Provide letter from motor manufacturer confirming motor is compatible with submitted VFD.

## **2.07 BEARINGS**

- A. Bearings:
  - 1. Antifriction-type AFBMA standard sizes.
  - 2. Minimum (L-10) life of 50,000 hours.
  - 3. Motor bearings shall be sealed and permanently grease lubricated with high temperature grease.
  - 4. Thrust ratings not less than the combined static and dynamic loads imposed.

## **2.08 SHOP/FACTORY FINISHING**

- A. All metal surfaces, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- A. Pumps shall be installed in accordance with the manufacturer's written instructions and recommendations and as shown on the Drawings. Installation shall include furnishing all grease and oil required for initial operation. All piping connections shall be made in a neat and leak-free manner.
- B. Take all necessary measurements in the field to determine the exact dimensions for all Work and the required sizes of all equipment under this Contract. All pertinent data and dimensions shall be verified.
- C. Install the recommended lubrication for normal operation prior to final testing.
- D. If required for any pump furnished, install copper seal water supply and drain piping, filters, pressure reducing valves, etc.

### **3.02 INSTALLATION**

- A. Install the pump in strict accordance with the manufacturer's instruction and recommendation and as shown on the Drawings.
- B. Suction pipe connections shall be vacuum tight. Fasteners at all pipe connections shall be tight. Install pipe with supports and thrust blocks to prevent strain and vibration on pump piping. Install and secure all service lines (level control, air release valve or pump drain lines) as required.
- C. Check motor and control data plates for compatibility to site voltage.
- D. Prior to applying electrical power to any motors or control equipment, check all wiring for tight connection. Verify that protective devices (fuses and circuit breakers) conform to project design documents. Manually operate circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.
- E. After all anchor bolts, piping and control connections are installed, completely fill the grout dam in the pump station base with non-shrink grout.

### **3.03 FIELD QUALITY CONTROL**

- A. Installation Certification: A manufacturer's authorized representative shall inspect and test each pump for proper installation, lubrication, alignment, and connection. Submit written certification of installation to the Engineer (use form provided in Section 01 99 90, "Reference Forms").
- B. Performance Testing: A manufacturer's authorized representative shall witness and assist with the performance testing of each pump to verify smooth operation and satisfactory performance. Hydraulic performance in the project wet well shall be adequate to demonstrate compliance with performance requirements:
  - 1. Contractor shall provide pressure gauge on suction and discharge side of discharge head for performance testing. Pressure gauges shall be provided to Owner after Performance Testing is complete.



- C. Vibration Testing: A manufacturer's authorized representative shall conduct vibration testing to ensure conformance with the Hydraulic Institute Standards. Maximum allowable vibrations shall not exceed the maximum peak-to-peak amplitude as set forth in the Hydraulic Institute Standards latest edition. The actual natural frequency of the installed pumping units shall be verified using industry accepted procedures.
- D. Test Results: Test results certified by the pump manufacturer's authorized representative shall be submitted to the Engineer for approval prior to the Owner's acceptance of the equipment.
- E. Coordination: All testing shall be coordinated with the Engineer, Owner, and installing contractor prior to conducting the tests.
- F. Should tests indicate an unsatisfactory operation, such as noise, leaks, poor pump performance, the manufacturer's representative shall assist the Contractor in diagnosing the conditions. The malfunction shall be corrected at no cost to the Owner and the tests repeated as defined herein.

### **3.04 MANUFACTURER'S SERVICES**

- A. Pump manufacturer shall provide a minimum of 10 hours of on-site service for certification of installation, start-up testing, and training. Training shall instruct operating personnel in the operation, maintenance, and adjustment of the system and installation.
- B. Manufacturer shall provide spare lubricants and oils as required for servicing of equipment.

### **END OF SECTION**

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**SECTION 22 13 64**  
**PIPING LEAKAGE TESTING**

**PART 1 – GENERAL**

**1.01 SUBMITTALS**

A. Quality Control Submittals:

1. Testing Plan:

- a. Submit prior to testing and include at least the information that follows:
  - 1) Testing dates.
  - 2) Piping systems and section(s) to be tested.
  - 3) Test type.
  - 4) Method of isolation.
  - 5) Calculation of maximum allowable leakage for piping section(s) to be tested.
  - 6) MOPO Plan if flow shutdown required.
- b. Certifications of Calibration: Testing equipment.
- c. Certified Test Report.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

**3.01 PREPARATION**

- A. Notify Engineer in writing 5 days in advance of testing. Perform testing in presence of Engineer.
- B. Pressure Piping:
  - 1. Install temporary thrust blocking or other restraint as necessary to protect adjacent piping or equipment and make taps in piping prior to testing.
  - 2. Prior to test, remove or suitably isolate appurtenant instruments or devices that could be damaged by pressure testing.
  - 3. Isolate new piping connected to existing piping with grooved-end pipe caps, spectacle blinds, blind flanges, or as acceptable to Engineer.
  - 4. Test Pressure: As indicated on the Pipe Schedule in Section 22 13 16.1, "Pipe Schedule".

C. Gravity Piping:

1. Perform testing after service connections, manholes, and backfilling have been completed between stations to be tested.
2. Determine groundwater level at time of testing by exploratory holes or other method acceptable to Engineer.
3. Pipe 42-Inch-Diameter and Larger Piping: Joint testing device may be used to isolate and test individual joints.

D. Test section may be filled with water and allowed to stand under low pressure prior to testing.

E. Hydrostatic Testing for Pressure Piping:

1. Fluid: Clean water to prevent corrosion of materials in piping system.
2. Exposed Piping:
  - a. Perform testing on installed piping prior to application of insulation.
  - b. Maximum Filling Velocity: 0.25 foot per second, applied over full area of pipe.
  - c. Vent Piping During Filling. Open vents at high points of piping system or loosen flanges, using at least four bolts, or use equipment vents to pump air pockets.
  - d. Maintain hydrostatic test pressure continuously for 30 minutes minimum, and for such additional time as necessary to conduct examinations for leakage.
  - e. Examine joints and connections for leakage.
  - f. Correct visible leakage and retest.
3. Buried Piping:
  - a. Test after backfilling has been completed unless otherwise approved by Engineer.
  - b. Expel air from piping system during filling.
  - c. Apply and maintain specified test pressure with hydraulic force pump. Valve off piping system when test pressure is reached.
  - d. Maintain hydrostatic test pressure continuously for 2 hours minimum, reopening isolation valve only as necessary to restore test pressure.
  - e. Determine actual leakage by measuring quantity of water necessary to maintain specified test pressure for duration of test.

4. Maximum Allowable Leakage:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

Where:

L = Allowable leakage, in gallons per hours.

S = Length of pipe tested, in feet.

D = Nominal diameter of pipe, in inches.

P = Test pressure during leakage test, in pounds per square inch.

5. Correct leakage greater than allowable, and retest.

F. Pneumatic Test for Pressure Piping:

1. Do not perform on:

- a. PVC or CPVC pipe.
- b. Piping larger than 6 inches.
- c. Buried and other nonexposed piping, unless otherwise indicated.

2. Fluid: Oil-free, dry air.

3. Procedure:

- a. Apply preliminary pneumatic test pressure of 25 psig maximum to piping system prior to final leak testing, to locate visible leaks. Apply soap bubble mixture to joints and connections, examine for leakage.
- b. Correct visible leaks and repeat preliminary test until visible leaks are corrected.
- c. Maintain pneumatic test pressure continuously for minimum of 10 minutes and for such additional time as necessary to conduct soap bubble examination for leakage.
- d. Correct visible leakage and retest.

G. Hydrostatic Test for Gravity Piping:

1. Testing Equipment Accuracy: Plus or minus 1/2 gallon of water leakage under specified conditions.
2. Maximum Allowable Leakage: 0.16 gallons per hour per inch diameter per 100 feet. Include service connection footage in test section, subjected to minimum head specified.

3. Hydrostatic Head:
  - a. At least 6 feet above maximum estimated groundwater level in section being tested.
  - b. No less than 6 feet above inside top of highest section of pipe in test section, including service connections.
4. Defective Piping Sections: Replace or test and seal individual joints and retest.

### **3.02 FIELD QUALITY CONTROL**

- A. Test Report documentation follows:
  1. Test date.
  2. Description and identification of piping tested.
  3. Test fluid.
  4. Test pressure.
  5. Remarks, including:
    - a. Leaks (type, location).
    - b. Repair/replacement performed to remedy excessive leakage.
  6. Signed by Contractor and Engineer to represent that test has been satisfactorily completed.

**END OF SECTION**

**SECTION 22 33 46**  
**PIPE HANGERS AND SUPPORTS**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section specifies hangers and supports for all piping systems for the Wastewater Treatment Plant.

**1.02 PIPING SUPPORT DESIGN**

- A. Except as noted on Drawing M1 of the Contract Documents, all details and final locations of pipe supports required are not shown or noted on the Drawings. It shall be the Contractor's responsibility to design, furnish, and install the pipe support sizes, types, locations, mounting requirements and all other items necessary to provide fully-supported and restrained piping systems.
- B. The Contractor shall provide the services of a professional engineer registered in the state of Washington ("Design Professional") for the design of all piping supports, seismic restraints, and provisions for control of dynamic forces and pipe expansion for all exposed piping systems shown on the Drawings. The Design Professional shall have not less than 5 years' experience in the type of piping support, seismic restraint, and expansion control design work required for this project.
- C. Whether a piping design or general arrangement is shown on the Drawings or not, the Design Professional shall design all pipe supports, anchorage, restraints, and expansion control as needed to properly support the piping system. Where a conflict arises with the supports and hangers shown on the Drawings, the Design Professional shall present any conflict to the Contractor for resolution with the Engineer.
- D. The requirement for a Design Professional shall not relieve the Contractor of overall responsibility for the design and installation of the work specified in this section.
- E. Piping support systems shall be designed, and Shop Drawings prepared and sealed, by a registered professional engineer in the state of Washington.

**1.03 DEFINITIONS**

- A. Ferrous Metal: Iron, steel, stainless steel, and alloys with iron as principal component.
- B. Exposed Area: Any area in contact with the atmosphere.
- C. Wetted and Submerged Area: Submerged, less than 1.5 feet above liquid surface, under cover or slab of channel or tank, or in other damp locations.
- D. Corrosive Areas: Shall mean any exposed surface inside the pipe gallery shown on the Drawings.
- E. Non-Corrosive Areas: Shall mean any exposed area not located in the corrosive areas defined above.

## **1.04 SUBMITTALS**

### **A. Shop Drawings:**

1. Layout drawings of piping supports signed and sealed by the Design Professional. Drawings shall identify supports, braces, hangers, guides, anchor types, materials, and finish by catalog number and locations.
2. Supporting calculations of piping supports and seismic bracing systems signed and sealed by the Design Professional.

### **B. Design Professional qualifications.**

### **C. Product data of all pipe supports, hangers, and anchoring systems.**

## **1.05 DESIGN REQUIREMENTS**

### **A. General:**

1. Seismic Load: Seismic design shall be based on factors given in the Structural General Notes found on the Drawings and Section 13 05 41, "Seismic Restraint Requirements for Nonstructural Components".
2. Design, furnish, and install all piping supports, hangers, and seismic bracing systems inside the building and reservoir, regardless of whether these supports and systems are shown on the Drawings. Provide seismic bracing to prevent permanent displacement in any direction caused by lateral motion, overturning or uplift.
3. Supports are shown only where specific types and locations are required; additional pipe supports may be required at these locations.
4. Meet requirements of MSS SP58, MSS SP69, and MSS SP89.
5. Contractor may use the latest edition of SMACNA/PPIC, "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems" in lieu of engineering each application. Contractor shall use Hazard Level "A" as defined in the guidelines.

### **B. Pipe Support Systems:**

1. Support Load: Dead loads imposed by weight of pipes filled with water, except air and gas pipes, plus insulation.
2. Safety Factor: Minimum of 5.
3. Maximum Support Spacing and Minimum Rod Size: Shall be in accordance with the Design Professional's drawings and design calculations.



C. Framing Support System:

1. Beams: Size such that beam stress does not exceed 25,000 psi and maximum deflection does not exceed 1/240 of span.
2. Column Members: Size in accordance with manufacturer's recommended method.
3. Support Loads: Calculate using weight of pipes filled with water.
4. Maximum Spans: As noted in the Standard Details or the Design Professional's Layout Drawings. In case of conflict between these two, the most conservative span shall apply.

D. Anchoring Devices: Design, size, and space support anchoring devices, including anchor bolts, inserts, and other devices used to anchor support, to withstand shear and pull-out loads imposed by loading and spacing on each particular support.

E. Vertical Sway Bracing: 10-foot-maximum centers or as shown on the Drawings.

## **1.06 HANGER AND SUPPORT SELECTION**

A. The Contactor shall cause the pipe hangers and supports to be designed and selected by the Design Professional. Hanger and supports selection shall be based on the following:

1. Pipe support selections shall be based on the pipe support classifications specified in MSS SP 69.
2. Contractor shall review the piping layout in relation to the surrounding structure and adjacent piping and equipment before selecting the type of supports to be used at each hanger or support location.
3. Where a particular type of pipe support is generally shown on the Drawings, that particular design shall be used.
4. Where a particular pipe support arrangement is shown the Drawings, that particular arrangement shall be used at that location(s).
5. Pipe support design shall conform to ASME B31.3.
6. Pipe hanger and support systems shall be coordinated with the seismic requirements shown on the Drawings and specified in Section 13 05 41, "Seismic Restraint Requirements for Nonstructural Components".
7. Hangers and supports shall withstand all static and dynamic conditions of loading to which the piping and associated equipment may be subjected to. As a minimum, the Contractor shall consider the following when designing and furnishing the pipe support and hanger systems:
  - a. Weights of pipe, valves, fittings, insulating materials, suspended hanger components, and normal fluid contents.
  - b. Weight of hydrostatic test fluid or cleaning fluid if normal operating fluid contents are lighter.

- c. Reaction forces due to test and operational conditions.
  - d. Reaction forces due to operation of safety, relief, or other valves.
  - e. Wind, snow, or ice loading on all outdoor piping.
- 8. Supports shall be designed to prevent transfer of the weight of piping, valves, and piping appurtenances to equipment piping connections. All adjacent supports at equipment connections to piping systems shall have provisions for vertical and horizontal adjustment. Two flexible piping connections not less than one pipe diameter apart shall be provided between piping supports and any equipment piping connection.
  - 9. Hangers and supports shall be sized to fit the outside diameter of pipe, tubing, or the outside diameter of piping insulation.
  - 10. Where negligible movement occurs at hanger locations, rod hangers shall be used for suspended lines, wherever practical. For piping supported from below, bases, brackets, or structural cross members shall be used.
  - 11. Hangers for the suspension of 2-1/2 inches and larger piping and tubing shall be capable of vertical adjustment under full load conditions.
  - 12. Supporting systems shall provide for and control the free or intended movement of the piping including tit movement in relation to that of the connected equipment.
  - 13. Where there is horizontal movement at a suspended type hanger location, hanger components shall be selected to allow for swing. The vertical angle of the hanger rod shall not, at any time, exceed four degrees.
  - 14. There shall be no contact between a pipe, hanger, or support components of dissimilar metals.
  - 15. Pump discharges shall have, as a minimum, a fixed anchor within five diameters from the discharge connection.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL**

- A. When items specified or depicted in the Standard Details are not available, fabricate pipe supports material to the general configuration indicated by catalogs. All pipe supports shall include braces for seismic loadings.
- B. Pipe Support Materials:
  - 1. Supports shall be AISI Type 316 stainless steel.

## **2.02 ANCHORING SYSTEMS**

### **A. Material:**

1. Wetted and Submerged Areas: AISI Type 316 stainless steel.
2. Non-Corrosive Areas: Hot-dipped galvanized steel.
3. Corrosive Areas: AISI Type 316 stainless steel.

### **B. Size: Sized by the Design Professional, 1/2-inch-minimum diameter, and as specified in Section 03 15 19, "Anchors, Inserts, and Embedded Products".**

## **2.03 CHANNEL TYPE SUPPORT SYSTEMS**

### **A. Metallic Channel Strut and Support Materials:**

1. Shall be hot-dip galvanized steel or stainless steel, in accordance with Paragraph 2.01.
2. Channel Size: 12-gauge, 1-5/8 inch by 1-5/8 inch series.
3. Members and Connections: Design for all loads with safety factor of 5.
4. Approved Manufacturers:
  - a. Unistrut, P1000.
  - b. Approved Equal.

### **B. Non-Metallic Channel Strut and Support Materials:**

1. Shall be pultruded glass-reinforced polyester or premium grade vinylester resin fiberglass for excellent corrosion resistance.
2. Shall have a synthetic surfacing veil applied on exterior surfaces to improve weatherability and inhibit ultraviolet degradation.
3. Channel Size: 1-5/8 inch by 1-5/8 inch series.
4. Approved Manufacturers:
  - a. Unistrut, F20P-2000, unless otherwise shown on the Drawings.
  - b. Approved Equal.

### **C. Members and Connections (Metallic and Non-Metallic Struts): Design all supporting fittings, members and connections for the loads specified herein.**

D. Strut Post Bases: Provide four-hole strut bases as specified below:

1. Metallic Struts: Shall be fabricated from galvanized steel and stainless steel, in accordance with Paragraph 2.01. Shall be Unistrut P2072A HG and P2072A SS or approved equal.
2. Non-Metallic Struts: Provide four-hole strut bases fabricated from glass-reinforced polyester resin, Unistrut F20PU-5853, or approved equal, unless otherwise shown on the Drawings.

E. Strut Pipe Straps:

1. Metallic: Shall be Standard Pipe Strap Model P2558 HG and P2558 SS series as manufactured by Unistrut, or approved equal, unless otherwise shown on the Drawings.
2. Non-Metallic: Provide two-hole pipe straps fabricated from glass-reinforced polyester resin, Unistrut FPS series, or approved equal, unless otherwise shown on the Drawings.
3. Tube Clamps: Shall be Unicushion Model P2600 EG and P2600 SS as manufactured by Unistrut, or approved equal.

F. General Strut Fittings: Contractor shall provide all additional fittings as required to fabricate the channel strut pipe support systems shown on the Drawings. All fitting materials provided for the metallic and non-metallic struts shall be in accordance with Paragraph 2.01.

G. Strut End Caps: Provide rubber end caps at the exposed ends of all channel struts, up to 7 feet above finished floor.

## **2.04 SHOP FINISHING**

A. Prepare, prime, and finish coat all metallic piping supports in accordance with Section 09 91 25, "Equipment Painting". Stainless steel and non-metallic support components shall not be coated.

## **2.05 ACCESSORIES**

A. Welding Insulation Saddles:

1. Type MSS SP58, Type 39.
2. Manufacturers and Products:
  - a. Grinnel, Figure Series 160.
  - b. B-Line, Figure Series B3160.
  - c. Or equal.

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

#### **A. General:**

1. Install support systems in accordance with MSS SP69, "Pipe Hangers and Supports-Selection and Application", and MSS SP89, "Pipe Hangers and Supports-Fabrication and Installation", unless shown otherwise.
2. Support piping connections to equipment by pipe support and not by the equipment. Pipe support components shall not be attached to pressure vessels.
3. Pipe support hangers, brackets, etc. shall be of suitable capacity and shall be appropriate to the individual structural member used to support the pipe.
4. The structural integrity of any new or existing members shall not be impacted by the placement of connections for pipe supports or any other embeds. For example, the tension reinforcement in reinforced concrete members shall not be impacted in any way by the placement of fasteners for pipe supports.
5. Pipe may be supported from the nearest structural element (floor, ceiling, wall) as long as these attachments shall not cause the structural member to exceed the design live load criteria shown on the Drawings.
6. Pipe supports shall not be placed at a location which will cause interference with the operation of valves, equipment, or other items that need to be accessed for regular operation and maintenance of the facility.
7. Support large or heavy valves, fittings, and appurtenances independently of connected piping.
8. Do not support any piping from any other piping segments above or adjacent.
9. Support pipe at changes in direction or in elevation, adjacent to flexible joints and couplings, and where shown.
10. Do not install pipe supports and hangers in equipment access areas.
11. Brace hanging pipes against horizontal movement by both longitudinal and lateral sway bracing.
12. Install lateral supports for seismic loads at all changes in direction and where pipe support does not provide adequate lateral support for tributary seismic loads.
13. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

14. Install pipe anchors where required to withstand expansion thrust loads and to direct and control thermal expansion.
15. Repair mounting surfaces to original condition after attachments are made.
16. Any pipe support connections welded to the pressure piping shall be performed so that the minimum design working pressure and thickness of the pressure piping is unaffected.

B. Intermediate and Pipe Alignment Guides:

1. Provide pipe alignment guides (or pipe supports that provide the same function) at all expansion joints and loops.
2. Guide piping on each side of an expansion joint or loop at 4 and 14 pipe-diameters from each joint or loop.
3. Install intermediate guides on metal-framing support systems not carrying a pipe anchor or alignment guide.

C. Pipe Slopes: Install hangers and supports so as not to create any intermediate high or low points along each piping segment run, unless otherwise indicated on the Drawings. Pipe slopes shall not exceed the maximum pipe deflections allowed by ASME B31.9 (for building services piping).

D. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment. Adjust hangers and supports as needed to distribute loads equally on attachments and to achieve indicated slope of pipe.

E. Fiberglass Strut System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled fiberglass struts.

F. Accessories:

1. Insulation Shield: Install on insulated nonsteel piping. Oversize rollers and supports.
2. Welding Insulation Saddle: Install on insulated steel pipe. Oversize rollers and supports.
3. Vibration Isolation Pad: Install under base flange or pedestal-type pipe supports within 3 feet of any pump or filter equipment, and other locations as required to isolate vibration from the piping systems.

4. Dielectric Barrier:
  - a. Install between all carbon steel supports (including those with hot-dipped galvanized surfaces) and copper or stainless steel pipe.
  - b. Install between stainless steel supports and dissimilar metal piping.
5. Electrical Isolation: Install 1/4-inch by 3-inch neoprene-rubber wrap between submerged metal pipe and oversized clamps.

**END OF SECTION**

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