



City of Tacoma
Environmental Services Department

SPECIFICATION NO. ES22-0060F

NORTH END WASTEWATER TREATMENT PLANT ODOR CONTROL BIOSCRUBBER

Project No. ENV-04016-07

CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT

REQUEST FOR BIDS

FOR

SPECIFICATION NO.
ES22-0060F

**NORTH END WASTEWATER TREATMENT PLANT ODOR
CONTROL BIOSCRUBBER**

PROJECT NO. 04016-07



Div 0

Lance M Bunch, P.E.
Science & Engineering Division
Environmental Services Department

326 East D Street
Tacoma, Washington 98421-1801

SPECIFICATION NO. ES22-0060F

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City of Tacoma
Environmental Services Department

REQUEST FOR BIDS ES22-0060F
North End Wastewater Treatment Plant Odor Control Bioscrubber

Submittal Deadline: 11:00 a.m., Pacific Time, Tuesday, August 23, 2022

Submittals must be received by the City's Procurement and Payables Division prior to 11:00 a.m. Pacific Time.

For electronic submittals, the City of Tacoma will designate the time of receipt recorded by our email, bids@cityoftacoma.org, as the official time of receipt. This clock will be used as the official time of receipt of all parts of electronic bid submittals.

Submittal Delivery: Sealed submittals will be received as follows:

By Email: bids@cityoftacoma.org Maximum file size: 35 MB. Multiple emails may be sent for each submittal	
By Carrier: If possible, please include a flash drive of your full submittal. City of Tacoma Procurement & Payables Division Tacoma Public Utilities 3628 S 35 th Street Tacoma, WA 98409	
In Person: If possible, please include a flash drive of your full submittal. City of Tacoma Procurement & Payables Division Tacoma Public Utilities Administration Building North Guard House (east side of main building) 3628 S 35 th Street Tacoma, WA 98409	
By Mail: If possible, please include a flash drive of your full submittal. City of Tacoma Procurement & Payables Division Tacoma Public Utilities PO Box 11007 Tacoma, WA 98411-0007	

Bid Opening: Held virtually each Tuesday at 11AM. Attend [via this link](#) or call 1 (253) 215 8782.

Submittals in response to a RFB will be recorded as received. As soon as possible on the day of submittal deadline, preliminary results will be posted to www.TacomaPurchasing.org.

Solicitation Documents: An electronic copy of the complete solicitation documents may be viewed and obtained at the City's plan distribution service provider, ARC, 632 Broadway, Tacoma, WA, or by going to <http://www.e-arc.com/location/tacoma>. Prospective bidders will be required to pay reproduction costs. A list of vendors registered for this solicitation is also available at their website.

Pre-Proposal Meeting: A pre-proposal meeting will be held at the North End Wastewater Treatment Plant located at 4006 N Waterview St, Tacoma, WA 98407 at 11:00 am on Monday, August 15th, 2022. The purpose of the pre-bid meeting is to answer any questions about this solicitation and any special or technical requirements.

Project Scope: The scope of work generally consist of general labor, supervision, materials, equipment, demolition, civil, structural, electrical, mechanical work, manufacturers services, and appurtenances necessary for a complete in place installation for the Odor Scrubber system on the existing solids holding tank located at the North End Wastewater Treatment Plant (NETP). All work required to complete the NETP Odor Control Bioscrubber as shown on the contract drawings and as specified in the contract documents.

Estimate: \$1,025,000 plus applicable sales tax

Paid Sick Leave: The City of Tacoma requires all employers to provide paid sick leave as set forth in Title 18 of the Tacoma Municipal Code. For more information, visit [our Minimum Employment Standards Paid Sick Leave webpage](#).

Americans with Disabilities Act (ADA Information): The City of Tacoma, in accordance with Section 504 of the Rehabilitation Act (Section 504) and the Americans with Disabilities Act (ADA), commits to nondiscrimination on the basis of disability, in all of its programs and activities. Specification materials can be made available in an alternate format by emailing Gail Himes at ghimes@cityoftacoma.org, or by calling her collect at 253-591-5785.

Title VI Information: "The City of Tacoma" in accordance with provisions of Title VI of the Civil Rights Act of 1964, (78 Stat. 252, 42 U.S.C. sections 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin in consideration of award.

Additional Information: Requests for information regarding the specifications may be obtained by contacting Dawn DeJarlais, Senior Buyer by email to ddejarlais@cityoftacoma.org.

Protest Policy: City of Tacoma protest policy, located at www.tacomapurchasing.org, specifies procedures for protests submitted prior to and after submittal deadline.



Meeting sites are accessible to persons with disabilities. Reasonable accommodations for persons with disabilities can be arranged with 48 hours advance notice by calling 253-502-8468.

SPECIAL REMINDER TO ALL BIDDERS

HEALTH & SAFETY: Be sure to comply with all City of Tacoma health and safety requirements.

PLEASE NOTE: Be sure you have complied with all specifications and requirements and have signed all required documents.

YOUR ATTENTION IS PARTICULARLY CALLED to the following forms, which must be executed in full and submitted with your bid response:

1. **BID PROPOSAL:** The unit prices bid must be shown in the space provided. Check your computations for omissions and errors.
2. **SIGNATURE PAGE:** To be filled in and executed by a duly authorized officer or representative of the bidding entity. If the bidder is a subsidiary or doing business on behalf of another entity, so state, and provide the firm name under which business is hereby transacted.
3. **BID BOND:** The Bid Bond must be executed by the person legally authorized to sign the bid, and must be properly signed by the representatives of the surety company unless the bid is accompanied by a certified check. If Bid Bond is furnished, the form furnished by the City must be followed; no variations from the language thereof will be accepted. The amount of the Bid Bond must be not less than 5% of the total amount bid.
4. **CERTIFICATION OF COMPLIANCE WITH WAGE PAYMENT STATUTES:** Bidder shall complete this form in its entirety to ensure compliance with state legislation (SHB 2017).
5. **STATE RESPONSIBILITY AND RECIPROCAL BID PREFERENCE INFORMATION:** Bidder shall complete this form in its entirety to ensure compliance with state legislation (SHB 2010).
6. **LIST OF SUBCONTRACTOR CATEGORIES OF WORK:** Bidder shall list all subcontractor(s) 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. Bidder shall also list all subcontractor(s) proposed to perform the work of structural steel installation and/or rebar installation.

FAILURE TO LIST SUBCONTRACTORS WILL RESULT IN THE BID BEING NON-RESPONSIVE AND THEREFORE VOID.

7. **STATEMENT OF QUALIFICATIONS:** The Contractor or subcontractor shall fill out this form in its entirety proving they meet the requirements as outlined in these specifications. It shall be the sole determination of the Engineer to determine if the

Contractor/subcontractor does in fact meet the requirements. This is a condition of award of the Contract.

POST AWARD FORMS EXECUTED UPON AWARD:

- A. CONTRACT: Must be executed by the successful bidder.
- B. PAYMENT BOND TO THE CITY OF TACOMA: Must be executed by the successful bidder and his/her surety company.
- C. PERFORMANCE BOND TO THE CITY OF TACOMA: Must be executed by the successful bidder and his/her surety company.
- D. CERTIFICATE OF INSURANCE: Shall be submitted with all required endorsements.
- E. LEAP UTILIZATION PLAN: Shall be submitted at the Pre-Construction Meeting.
- F. GENERAL RELEASE.

CODE OF ETHICS: The successful bidder agrees that its violation of the City's Code of Ethics contained in TMC Chapter 1.46 shall constitute a breach of the contract subjecting the contract to termination.

LOCAL EMPLOYMENT AND APPRENTICESHIP TRAINING PROGRAM (LEAP):

The Local Employment and Apprenticeship Training Program (LEAP) has been adopted to counteract economic and social ills, which accompany high rates of unemployment within the City of Tacoma. The Tacoma City Council established the mandatory LEAP program for public works contracts pursuant to Ordinance No. 28520. The primary goal is to provide an opportunity for City of Tacoma residents and Tacoma Public Utilities ratepayers to enter apprenticeship programs, acquire skills, and perform work that will provide living wages.

LEAP Goals:

1. Local Employment Utilization Goal – Prime contractor is required to ensure that 15 percent of the labor hours worked on the project are performed by residents of the City of Tacoma or local economically distressed areas, whether or not such person is an Apprentice.
2. Apprentice Utilization Goal - Prime contractor is required to ensure that 15 percent of the labor hours worked on the project are performed by Apprentices who reside in the Tacoma Public Utilities service area.

NOTE: If both goals are assigned to this project, the two goals can be satisfied concurrently if the prime contractor utilizes individuals who simultaneously meet the requirements of both goals, such as an apprentice who resides in the City of Tacoma or in a local economically distressed area.

See City of Tacoma – Local Employment and Apprenticeship Training Program section for additional information.

**CITY OF TACOMA
FINANCE/PURCHASING DIVISION
SPECIAL NOTICE TO BIDDERS**

Public works and improvement projects for the City of Tacoma are subject to Washington state law and Tacoma Municipal Code, including, but not limited to the following:

I. STATE OF WASHINGTON

A. RESPONSIBILITY CRITERIA – STATE OF WASHINGTON

In order to be considered a responsible bidder the bidder must meet the following mandatory state responsibility criteria contained in RCW 39.04.350:

1. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW, which must have been in effect **at the time of bid submittal**;
2. Have a current Washington Unified Business Identifier (UBI) number;
3. If applicable:
 - a. Have Industrial Insurance (workers' compensation) coverage for the bidder's employees working in Washington, as required in Title 51 RCW;
 - b. Have a Washington Employment Security Department number, as required in Title 50 RCW;
 - c. Have a Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW and;
4. Not be disqualified from bidding on any public works contract under RCW 39.06.010 (unlicensed or unregistered contractors) or 39.12.065(3) (prevailing wage).
5. Have received training on the requirements related to public works and prevailing wage under this chapter and chapter 39.12 RCW and must designate a person or persons to be trained on these requirements. The training must be provided by the department of labor and industries or by a training provider whose curriculum is approved by the department. Bidders that have completed three or more public works projects and have had a valid business license in Washington for three or more years are exempt from this subsection.

B. RECIPROCAL PREFERENCE FOR RESIDENT CONTRACTORS:

Effective March 30, 2012, RCW 39.04.380 imposes a reciprocal preference for resident contractors. Any bid received from a non-resident contractor from a state that provides an in-state percentage bidding preference is subject application of a comparable percentage disadvantage.

A non-resident contractor from a state that provides an in-state percentage bidding preference means a contractor that:

1. Is from a state that provides a percentage bid preference to its resident contractors bidding on public works projects, and
2. Does not have a physical office located in Washington at the time of bidding on the City of Tacoma public works project.

The state of residence for a non-resident contractor is the state in which the contractor was incorporated, or if not a corporation, the state in which the contractor's business entity was formed.

The City of Tacoma will evaluate all non-resident contractors for an out of state bidder preference. If the state of the non-resident contractor provides an in state contractor preference, a comparable percentage disadvantage will be applied to the non-resident contractor's bid prior to contract award. The responsive and lowest and best responsible bidder after application of any non-resident disadvantage will be awarded the contract.

The reciprocal preference evaluation does not apply to public works procured pursuant to RCW 39.04.155, RCW 39.04.280, federally funded competitive solicitations where such agencies prohibit the application of bid preferences, or any other procurement exempt from competitive bidding.

Bidders must provide the City of Tacoma with their state of incorporation or the state in which the business entity was formed and include whether the bidder has a physical office located in Washington.

The bidder shall submit documentation demonstrating compliance with above criteria on the enclosed State Responsibility and Reciprocal Bidder Information form.

C. SUBCONTRACTOR RESPONSIBILITY

1. The Contractor shall include the language of this subcontractor responsibility section in each of its first tier subcontracts, and shall require each of its subcontractors to include the same language of this section in each of their subcontracts, adjusting only as necessary the terms used for the contracting parties. The requirements of this section apply to all subcontractors regardless of tier.
2. At the time of subcontract execution, the Contractor shall verify that each of its first tier subcontractors meets the following bidder responsibility criteria:
 - a. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW, which must have been in effect at the time of subcontract bid submittal;
 - b. Have a current Washington Unified Business Identifier (UBI) number;
 - c. If applicable, have:
 - a. Have Industrial Insurance (workers' compensation) coverage for the bidder's employees working in Washington, as required in Title 51 RCW;
 - b. A Washington Employment Security Department number, as required in Title 50 RCW;
 - c. A Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
 - d. An electrical contractor license, if required by Chapter 19.28 RCW;
 - e. An elevator contractor license, if required by Chapter 70.87 RCW and;
3. Not be disqualified from bidding on any public works contract under RCW 39.06.010 (unlicensed or unregistered contractors) or 39.12.065(3) (prevailing wage).

II. CITY OF TACOMA

A. SUPPLEMENTAL RESPONSIBILITY CRITERIA – CITY OF TACOMA:

In order to be considered a responsible bidder, the prospective bidder shall have all of the following qualifications set forth in Tacoma Municipal Code 1.06.262:

1. Adequate financial resources or the ability to secure such resources;
2. The necessary experience, stability, organization and technical qualifications to perform the proposed contract;
3. The ability to comply with the required performance schedule, taking into consideration all existing business commitments;
4. A satisfactory record of performance, integrity, judgment and skills; and
5. Be otherwise qualified and eligible to receive an award under applicable laws and regulations.
 - a. Bidder Responsibility. Bidders shall not be in violation of 39.04.350 RCW Bidder Responsibility Criteria - Supplemental Criteria.

In addition to the mandatory bidder responsibility criteria listed immediately above, the City may, in addition to price, consider any or all of the following criteria contained in Tacoma Municipal Code Chapter 1.06.262 in determining bidder responsibility:

1. The ability, capacity, experience, stability, technical qualifications and skill of the respondent to perform the contract;
2. Whether the respondent can perform the contract within the time specified, without delay or interference;
3. Integrity, reputation, character, judgment, experience, and efficiency of the respondents, including past compliance with the City's Ethics Code;
4. Quality of performance of previous contracts;
5. Previous and existing compliance with laws and ordinances relating to contracts or services;
6. Sufficiency of the respondent's financial resources;
7. Quality, availability, and adaptability of the supplies, purchased services or public works to the particular use required;
8. Ability of the respondent to provide future maintenance and service on a timely basis;
9. Payment terms and prompt pay discounts;
10. The number and scope of conditions attached to the submittal;
11. Compliance with all applicable City requirements, including but not limited to the City's Ethics Code and its Equity in Contracting and Local Employment and Apprenticeship Training programs;
12. Other qualification criteria set forth in the specification or advertisement that the appropriate department or division head determines to be in the best interests of the City.

The City may require bidders to furnish information, sworn or certified to be true, to demonstrate compliance with the City responsibility criteria set forth above. If the city manager or director of utilities is not satisfied with the sufficiency of the information provided, or if the prospective respondent does not substantially meet all responsibility requirements, any submittal from such respondent must be disregarded.

B. ADDITIONAL SUPPLEMENTAL CRITERIA – NOT APPLICABLE

C. MODIFICATIONS TO SUPPLEMENTAL CRITERIA

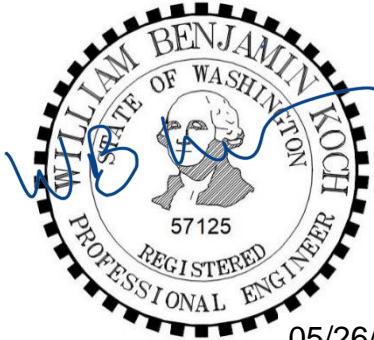
Potential bidders may request modifications to the City's **supplemental criteria** by submitting a written request to the Purchasing Division via email to bids@cityoftacoma.org no later than 5:00 p.m. Pacific Time, three days prior to the submittal deadline. Please include the Specification No. and Title when submitting such requests. Requests must include justification for why certain criteria should be modified. Requests received after this date and time will not be considered.

The City will respond to a timely submitted request prior to the bid opening date. Changes to the supplemental criteria, if warranted, will be issued by addendum to the solicitation documents and posted to the City's website for the attention of all prospective bidders.

D. DETERMINATION OF BIDDER RESPONSIBILITY

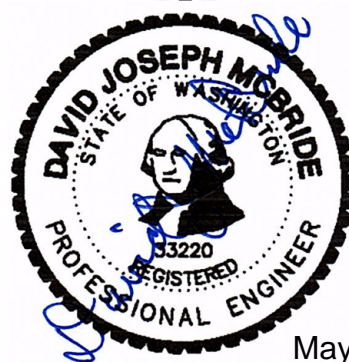
If the City determines the bidder does not meet the criteria above and is therefore not a responsible bidder, the City shall notify the bidder in writing with the reasons for its determination. If the bidder disagrees, the bidder may appeal the determination in a manner consistent with the City's Protest Policy. Appeals are coordinated by the Purchasing Division heard by the Procurement and Payables Division manager for contracts less than or equal to \$500,000 and by Contracts and Awards Board for contracts greater than \$500,000.

PROFESSIONAL SEALS



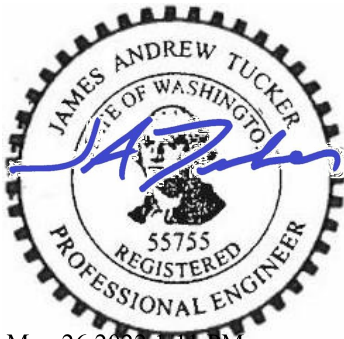
05/26/2022

William B. Koch, P.E.
Divisions 2, 23, 43, 44



May 26, 2022

David McBride, P.E.
Divisions 1 and 31



May 26 2022 1:14 PM

Drew Tucker, P.E.
Division 26

PART I

BID PROPOSAL AND CONTRACT FORMS

B I D P R O P O S A L

SPECIFICATION NO. ES22-0060F

NORTH END WASTEWATER TREATMENT PLANT ODOR CONTROL BIOSCRUBBER

The undersigned hereby certifies that he/she has examined the location and construction details of work as outlined on the Plans and Specifications for Project No. **ENV-04016-07** and has read and thoroughly understands the Plans and Specifications and contract governing the work embraced in this improvement and the method by which payment will be made for said work, and hereby proposes to undertake and complete the work embraced in this improvement in accordance with said Plans, Specifications and Contract and at the following schedule of rates and prices:

NOTE: 1. All extensions and total amount of bid should be shown.

<u>ITEM NO.</u>	<u>ITEM DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
1.	Odor Control Bioscrubber Project, including equipment procurement, equipment installation, vendor services and supporting demolition, civil/sitework, structural, mechanical, electrical, controls, and ancillary improvements; and including all supervision, labor, equipment, materials and general requirements; complete, per these Bid Documents, per lump sum.	1 Lump Sum	\$ _____	\$ _____

Base Bid (Subtotal Item No. 1) \$ _____

10.3 % Sales Tax (Item No. 1) \$ _____

The undersigned hereby certifies that for the Base Bid amount, the odor control bioscrubber equipment and all assigned unit responsibilities, pursuant to Section 44 31 21, will be provided by the following Odor Control Bioscrubber Manufacturer <circle one of numbers 1., 2., 3., or 4.>

1. Ecoverde (Phoenix, Arizona)
2. BioRem (Puslinch, Ontario)
3. BioAir (Voorhees, New Jersey)
4. Substitution accepted in accordance with Supplementary Conditions SC-1.04 and Section 01 25 00 prior to Bid Opening _____ <write in>

SIGNATURE PAGE

CITY OF TACOMA ENVIRONMENTAL SERVICES DEPARTMENT

All submittals must be in ink or typewritten, executed by a duly authorized officer or representative of the bidding/proposing entity, and received and time stamped as directed in the **Request for Bids page near the beginning of the specification**. If the bidder/proposer is a subsidiary or doing business on behalf of another entity, so state, and provide the firm name under which business is hereby transacted.

REQUEST FOR BIDS SPECIFICATION NO. ES22-0060F NORTH END WASTEWATER TREATMENT PLANT ODOR CONTROL BIOSCRUBBER

The undersigned bidder/proposer hereby agrees to execute the proposed contract and furnish all materials, labor, tools, equipment and all other facilities and services in accordance with these specifications.

The bidder/proposer agrees, by submitting a bid/proposal under these specifications, that in the event any litigation should arise concerning the submission of bids/proposals or the award of contract under this specification, Request for Bids, Request for Proposals or Request for Qualifications, the venue of such action or litigation shall be in the Superior Court of the State of Washington, in and for the County of Pierce.

Non-Collusion Declaration

The undersigned bidder/proposer hereby certifies under penalty of perjury that this bid/proposal is genuine and not a sham or collusive bid/proposal, or made in the interests or on behalf of any person or entity not herein named; and that said bidder/proposer has not directly or indirectly induced or solicited any contractor or supplier on the above work to put in a sham bid/proposal or any person or entity to refrain from submitting a bid/proposal; and that said bidder/proposer has not, in any manner, sought by collusion to secure to itself an advantage over any other contractor(s) or person(s).

Bidder/Proposer's Registered Name

Signature of Person Authorized to Enter Date
into Contracts for Bidder/Proposer

Address

Printed Name and Title

City, State, Zip

(Area Code) Telephone Number / Fax Number

Authorized Signatory E-Mail Address

State Business License Number
in WA, also known as UBI (Unified Business Identifier) Number

E.I.No. / Federal Social Security Number Used on Quarterly
Federal Tax Return, U.S. Treasury Dept. Form 941

State Contractor's License Number
(See Ch. 18.27, R.C.W.)

E-Mail Address for Communications

Addendum acknowledgement #1_____ #2_____ #3_____ #4_____ #5_____

THIS PAGE MUST BE SIGNED AND RETURNED WITH SUBMITTAL.

Herewith find deposit in the form of a cashier's check in the amount of \$_____ which amount is not less than 5-percent of the total bid.

SIGN HERE_____

BID BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the City of Tacoma, as Obligee, in the penal sum of _____ dollars, for the payment of which the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

The condition of this obligation is such that if the Obligee shall make any award to the Principal for

according to the terms of the proposal or bid made by the Principal therefor, and the Principal shall duly make and enter into a contract with the Obligee in accordance with the terms of said proposal or bid and award and shall give bond for faithful performance thereof, with Surety or Sureties approved by the Obligee; or if the Principal shall, in case of failure to do so, pay and forfeit to the Obligee the penal amount of the deposit specified in the call for bids, then this obligation shall be null and void; otherwise it shall be and remain in full force and effect and the Surety shall forthwith pay and forfeit to the Obligee, as penalty and liquidated damages, the amount of this bond.

SIGNED, SEALED AND DATED THIS _____ DAY OF _____, 20_____.

PRINCIPAL:

SURETY:

_____, 20_____

Received return of deposit in the sum of \$ _____



City of Tacoma

Certification of Compliance with Wage Payment Statutes

The bidder hereby certifies that, within the three-year period immediately preceding the bid solicitation date (August 9, 2022), that the bidder is not a “willful” violator, as defined in RCW 49.48.082, of any provision of chapters 49.46, 49.48, or 49.52 RCW, as determined by a final and binding citation and notice of assessment issued by the Department of Labor and Industries or through a civil judgment entered by a court of limited or general jurisdiction.

I certify under penalty of perjury under the laws of the state of Washington that the foregoing is true and correct.

Bidder

Signature of Authorized Official*

Printed Name

Title

Date

City

State

Check One:

Individual ☐

Partnership ☐

Joint Venture ☐

Corporation ☐

State of Incorporation, or if not a corporation, the state where business entity was formed:

If a co-partnership, give firm name under which business is transacted:

** If a corporation, proposal must be executed in the corporate name by the president or vice-president (or any other corporate officer accompanied by evidence of authority to sign). If a co-partnership, proposal must be executed by a partner.*

Specification No. _____

Name of Bidder: _____

State Responsibility and Reciprocal Bid Preference Information

Certificate of registration as a contractor
(Must be in effect at the time of bid submittal):

Number: _____

Effective Date: _____

Expiration Date: _____

Current Washington Unified Business Identifier
(UBI) Number:

Number: _____

Do you have industrial insurance (workers' compensation)
Coverage nor your employees working in Washington?

☐ Yes ☐ No
☐ Not Applicable

Washington Employment Security Department Number

Number: _____

☐ Not Applicable

Washington Department of Revenue state excise tax
Registration number:

Number: _____

☐ Not Applicable

Have you been disqualified from bidding any public
works contracts under RCW 39.06.010 or 39.12.065(3)?

☐ Yes ☐ No
If yes, provide an explanation of your
disqualification on a separate page.

Do you have a physical office located in the state of
Washington?

☐ Yes ☐ No

If incorporated, in what state were you incorporated?

State: _____ ☐ Not Incorporated

If not incorporated, in what state was your business
entity formed?

State: _____

Have you completed the training required by RCW
39.04.350, or are you on the list of exempt businesses
maintained by the Department of Labor and Industries?

☐ Yes ☐ No

List of Subcontractor Categories of Work

Project Name _____

Subcontractor(s) that are proposed to perform the work of heating, ventilation and air conditioning, and/or plumbing, as described in Chapter 18.106 RCW, and electrical as described in Chapter 19.28 RCW must be listed below. **This information must be submitted with the bid proposal or within one hour of the published bid submittal time via email to bids@cityoftacoma.org.**

Subcontractor(s) that are proposed to perform the work of structural steel installation and/or rebar installation must be listed below. **This information must be submitted with the bid proposal or within forty-eight hours of the published bid submittal time via email to bids@cityoftacoma.org.**

Failure to list subcontractors or naming more than one subcontractor to perform the same work will result in your bid being non-responsive. Contractors self-performing must list themselves below. The work to be performed is to be listed below the subcontractor(s) name.

Subcontractor Name	_____
Work to be Performed	_____

Subcontractor Name	_____
Work to be Performed	_____

Subcontractor Name	_____
Work to be Performed	_____

Subcontractor Name	_____
Work to be Performed	_____

Subcontractor Name	_____
Work to be Performed	_____

**STATEMENT OF QUALIFICATIONS FOR
NORTH END WASTEWATER TREATMENT PLANT ODOR CONTROL
BIOSCRUBBER**

This form shall be completed in its entirety and submitted with the bid package.

Failure to submit and meet the requirements of the Specifications shall be grounds for rejection of the Bid. The City of Tacoma shall be the sole judge in determining if the prospective bidder meets the minimum experience requirements.

Bidder shall have performed at least five (5) of water and wastewater treatment projects with cumulative total contract value over \$750K within the past ten (10) years. Superintendent has successfully completed a minimum of three (3) projects in the last ten (10) years at water and wastewater treatment plant sites. Bidder will self-perform a minimum of 50% of the total contract value

Contractor (Superintendent) performing the work for the North End Wastewater Treatment Plant Odor Control Bioscrubber :

Name of Contractor: _____

Address: _____

Gross dollar amount of work under contract: _____

List three (3) references that indicate experience with water and wastewater treatment facilities:

<u>Company</u>	<u>Name</u>	<u>Phone</u>	<u>Email</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

List five (5) major projects of a similar nature that have been completed by the Contractor within the last ten (10) years and the gross dollar amount of each project:

<u>Project Name</u>	<u>Amount</u>	<u>Owner</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

List three (3) major projects of a similar nature that have been completed by the Superintendent within the last ten (10) years and the gross dollar amount of each project:

<u>Project Name</u>	<u>Amount</u>	<u>Owner</u>

CONTRACT

Resolution No.
Contract No.

This Contract is made and entered into effective as of [Month], [Day], [Year] ("Effective Date") by and between the City of Tacoma, a Municipal Corporation of the State of Washington ("City"), and [supplier name as it appears in Ariba, including dbas or trade names] ("Contractor").

That in consideration of the mutual promises and obligations hereinafter set forth the Parties hereto agree as follows:

- I. Contractor shall fully execute and diligently and completely perform all work and provide all services and deliverables described herein and in the items listed below each of which are fully incorporated herein and which collectively are referred to as "Contract Documents":

 1. Specification No. [Spec Number] [Spec Title] together with all authorized addenda.
 2. Contractor's submittal [or specifically described portions thereof] dated [Enter Submittal Date] submitted in response to Specification No. [Spec Number] [Spec Title].
 3. Describe with specific detail and list separately any other documents that will make up the contract (fee schedule, work schedule, authorized personnel, etc.) or any other additional items mutually intended to be binding upon the parties.

- II. If federal funds will be used to fund, pay or reimburse all or a portion of the services provided under the Contract, the terms and conditions set forth at this Appendix A are incorporated into and made part of this Contract and CONTRACTOR will comply with all applicable provisions of Appendix A and with all applicable federal laws, regulations, executive orders, policies, procedures, and directives in the performance of this Contract.

If CONTRACTOR's receipt of federal funds under this Contract is as a sub-recipient, a fully completed Appendix B, "Sub-recipient Information and Requirements" is incorporated into and made part of this Contract.
- III. In the event of a conflict or inconsistency between the terms and conditions contained in this document entitled Contract and any terms and conditions contained the above referenced Contract Documents the following order of precedence applies with the first listed item being the most controlling and the last listed item the least controlling:
 1. Contract, inclusive of Appendices A and B.
 2. List remaining Contract Documents in applicable controlling order.
- IV. The Contract terminates on xxxxx, and may be renewed for xxxxxxxx
- V. The total price to be paid by City for Contractor's full and complete performance hereunder, including during any authorized renewal terms, may not exceed:
\$[Dollar Amount], plus any applicable taxes.
- VI. Contractor agrees to accept as full payment hereunder the amounts specified herein and in Contract Documents, and the City agrees to make payments at the times and in the manner and upon the terms and conditions specified. Except as may be otherwise provided herein or in Contract Documents Contractor shall provide and bear the expense of all equipment, work and labor of any sort whatsoever that may be required for the transfer of materials and for constructing and completing the work and providing the services and deliverables required by this Contract.
- VII. The City's preferred method of payment is by ePayables (Payment Plus), followed by credit card (aka procurement card), then Electronic Funds Transfer (EFT) by Automated Clearing House (ACH), then check or other cash equivalent. CONTRACTOR may be required to have the capability of accepting the City's ePayables or credit card methods of payment. The City of Tacoma will not accept price changes or pay additional fees when ePayables (Payment Plus) or credit card is used. The City, in its sole discretion, will determine the method of payment for this Contract.

VIII. Failure by City to identify a deficiency in the insurance documentation provided by Contractor or failure of City to demand verification of coverage or compliance by Contractor with the insurance requirements contained in the Contract Documents shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

IX. Contractor and for its heirs, executors, administrators, successors, and assigns, does hereby agree to the full performance of all the requirements contained herein and in Contract Documents.

It is further provided that no liability shall attach to City by reason of entering into this Contract, except as expressly provided herein.

IN WITNESS WHEREOF, the Parties hereto have accepted and executed this Contract, as of the Effective Date stated above, which shall be Effective Date for bonding purposes as applicable.

CITY OF TACOMA:

Signature:

Name:

Title:

CONTRACTOR:

Signature:

Name:

Title:

(City of Tacoma use only - blank lines are intentional)

Director of Finance: _____

Deputy/City Attorney (approved as to form): _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

Approved By: _____

**APPENDIX A
FEDERAL FUNDING**

1. Termination for Breach

CITY may terminate this Contract in the event of any material breach of any of the terms and conditions of this Contract if CONTRACTOR's breach continues in effect after written notice of breach and 30 days to cure such breach and fails to cure such breach.

2. Prevailing Wages

1. If federal, state, local, or any applicable law requires CONTRACTOR to pay prevailing wages in connection with this Contract, and CONTRACTOR is so notified by the CITY, then CONTRACTOR shall pay applicable prevailing wages and otherwise comply with the Washington State Prevailing Wage Act (RCW 39.12) in the performance of this Contract.
2. If applicable, a Schedule of Prevailing Wage Rates and/or the current prevailing wage determination made by the Secretary of Labor for the locality or localities where the Contract will be performed is made of part of the Contract by this reference. If prevailing wages apply to the Contract, CONTRACTOR and its subcontractors shall:
 - i. Be bound by and perform all transactions regarding the Contract relating to prevailing wages and the usual fringe benefits in compliance with the provisions of Chapter 39.12 RCW, as amended, the Washington State Prevailing Wage Act and/or the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable, including the federal requirement to pay wages not less than once a week.
 - ii. Ensure that no worker, laborer or mechanic employed in the performance of any part of the Contract shall be paid less than the prevailing rate of wage specified on that Schedule and/or specified in a wage determination made by the Secretary of Labor (unless specifically preempted by federal law, the higher of the Washington state prevailing wage or federal Davis-Bacon rate of wage must be paid.
 - iii. Immediately upon award of the Contract, contact the Department of Labor and Industries, Prevailing Wages section, Olympia, Washington and/or the federal Department of Labor, to obtain full information, forms and procedures relating to these matters. Per such procedures, a Statement of Intent to Pay Prevailing Wages and/or other or additional documentation required by applicable federal law, must be submitted by CONTRACTOR and its subcontractors to the CITY, in the manner requested by the CITY, prior to any payment by the CITY hereunder, and an Affidavit of Wages Paid and/or other or additional documentation required by federal law must be received or verified by the CITY prior to final Contract payment.

3. COPELAND ANTI-KICKBACK ACT

For Contracts subject to Davis Bacon Act the following clauses will be incorporated into the Contract:

- A. CONTRACTOR shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this Contract.
- B. CONTRACTOR or subcontractor shall insert in any subcontracts the clause above and such other clauses federal agencies may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts.

The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these Contract clauses.

- C. Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

4. EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this Contract, CONTRACTOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. If the CONTRACTOR does over \$10,000 in business a year that is funded, paid or reimbursed with federal funds, CONTRACTOR will take specific and affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

- A. Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- B. CONTRACTOR will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- C. CONTRACTOR will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.
- D. CONTRACTOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- E. CONTRACTOR will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- F. In the event of CONTRACTOR's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the CONTRACTOR may be declared ineligible for further federally funded contracts in accordance with procedures

authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

- G. CONTRACTOR will include the portion of the sentence immediately preceding paragraph (A) and the provisions of paragraphs (A) through (G) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. CONTRACTOR will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event CONTRACTOR becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the CONTRACTOR may request the United States to enter into such litigation to protect the interests of the United States.

5. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

- A. Overtime requirements. Neither CONTRACTOR or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- B. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (3)(A) of this section the CONTRACTOR and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such CONTRACTOR and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (3)(A) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (3)(A) of this section.
- C. Withholding for unpaid wages and liquidated damages. The CITY shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the CONTRACTOR or subcontractor under any such contract or any other Federal

contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such CONTRACTOR or sub-contractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (3)(B) of this section.

- D. Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (3)(A) through (D) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime CONTRACTOR shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (3)(A) through (D) of this section.

6. CLEAN AIR ACT

- A. CONTRACTOR agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
- B. CONTRACTOR agrees to report each violation to the CITY and understands and agrees that the CITY will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

CONTRACTOR agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with federal funds.

7. FEDERAL WATER POLLUTION CONTROL ACT

- A. CONTRACTOR agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
- B. CONTRACTOR agrees to report each violation to the CITY and understands and agrees that the CITY will, in turn, report each violation as required to assure notification to the appropriate federal agency.
- C. CONTRACTOR agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with federal funding.

8. DEBARMENT AND SUSPENSION

- A. This Contract is a Covered Transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the CONTRACTOR is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
- B. CONTRACTOR must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier Covered Transaction it enters into.

- C. This certification is a material representation of fact relied upon by the CITY. If it is later determined that the CONTRACTOR did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to CITY, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- D. CONTRACTOR agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C throughout the period of this Contract and to include a provision requiring such compliance in its lower tier covered transactions.

9. BYRD ANTI-LOBBYING AMENDMENT

- A. Contractors who apply or bid for an award of \$100,000 or more shall file the required certification with CITY. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the CITY.
- B. If applicable, CONTRACTOR must sign and submit to the CITY the certification required by Appendix A to 44 CFR Part 18 contained at Appendix A-1 to this Contract.

10. PROCUREMENT OF RECOVERED MATERIALS

- A. In the performance of this Contract, CONTRACTOR shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired:
 - i. Competitively within a timeframe providing for compliance with the contract performance schedule;
 - ii. Meeting contract performance requirements; or
 - iii. At a reasonable price.
- B. Information about this requirement, along with the list of EPA- designated items, is available at EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.
- C. CONTRACTOR also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

APPENDIX A-1

APPENDIX A to 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap.38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Date

APPENDIX B—Sub-recipient information and requirements

Pursuant to 2 CFR 200.332(a)(1) Federal Award Identification

(i) Agency Name (must match the name associated with its unique entity identifier)		(ii) Unique Entity Identifier <i>(i.e., DUNS)</i>	City of Tacoma Number for This Agreement
(iii) Federal Award Identification Number (FAIN)	(iv) Federal Award Date	(v) Federal Period of Performance Start and End Date	(vi) Federal Budget Period Start and End Date
(vii) Amount of Federal Funds <i>Obligated</i> to the agency <i>by this action</i>: \$	(viii) Total Amount of Federal Funds <i>Obligated</i> to the agency		(ix) Total Amount of the Federal Award <i>Committed</i> to the agency \$
(x) Federal Award Project Description: CORONAVIRUS STATE AND LOCAL FISCAL RECOVERY FUNDS– City of Tacoma			
(xi) Federal Awarding Agency: DEPARTMENT OF THE TREASURY	Pass-Through Entity: City of Tacoma		Awarding Official Name and Contact Information:
(xii) Assistance Listing Number and Name (the pass-through entity must identify the dollar amount made available under each Federal award and the Assistance Listing number at time of disbursement)			(xiii) Identification of Whether the Award is R&D
(xiv) Indirect Cost Rate for the Federal Award	Award Payment Method (lump sum payment or reimbursement) REIMBURSEMENT		



PAYMENT BOND TO THE CITY OF TACOMA

Resolution No.
Bond No.

That we, the undersigned,

as principal, and _____
as a surety, are jointly and severally held and firmly bound to the CITY OF TACOMA, in the penal sum of,
\$ _____, for the payment whereof Contractor and Surety bind themselves,
their executors, administrators, legal representatives, successors and assigns, jointly and severally, firmly by these presents.

This obligation is entered into in pursuance of the statutes of the State of Washington, the Ordinances of the City of Tacoma.

WHEREAS, under and pursuant to the City Charter and general ordinances of the City of Tacoma, the said City has or is about to enter with the above bounden principal, a contract, providing for

Specification No. _____

Specification Title: _____

Contract No. _____

(which contract is referenced to herein and is made a part hereof as though attached hereto), and

WHEREAS, the said principal has accepted, the said contract, and undertake to perform the work therein provided for in the manner and within the time set forth.

This statutory payment bond shall become null and void, if and when the Principal, its heirs, executors, administrators, successors, or assigns shall pay all persons in accordance with RCW 39.08, 39.12, and 60.28, including all workers, laborers, mechanics, subcontractors, and materialmen, and all person who shall supply such contractor or subcontractor with provisions and supplies for the carrying on of such work, and all taxes incurred on said Contract under Titles 50 and 51 RCW and all taxes imposed on the Principal under Title 82 RCW; and if such payment obligations have not been fulfilled, this bond shall remain in full force and effect.

The Surety for value received agrees that no change, extension of time, alteration or addition to the terms of the Contract shall in any way affect its obligation on this bond, and waives notice of any changes, extension of time, alteration or addition to the terms of the Contract or the work performed. The Surety agrees that modifications and changes to the terms and conditions of the Contract that increase the total amount to be paid the Principal shall automatically increase the obligation of the Surety on this bond and notice to Surety is not required for such increased obligation.

No suit or action shall be commenced hereunder by any claimant unless claimant shall have given the written notices to the City, and where required, the Contractor, in accordance with RCW 39.08.030.

The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of claims which may be properly filed in accordance with RCW 39.08 whether or not suit is commenced under and against this bond.

If any claimant shall commence suit and obtain judgment against the Surety for recovery hereunder, then the Surety, in addition to such judgment and attorney fees as provided by RCW 39.08.030, shall also pay such costs and attorney fees as may be incurred by the City as a result of such suit. Venue for any action arising out of or in connection with this bond shall be in Pierce County, WA.

Surety companies executing bonds must be authorized to transact business in the State of Washington as surety and named in the current list of "Surety Companies Acceptable in Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Department of the Treasury.

Resolution No.
Bond No.
Specification No.
Contract No.

One original bond shall be executed, and be signed by the parties' duly authorized officers. This bond will only be accepted if it is accompanied by a fully executed power of attorney for the office executing on behalf of the surety.

Principal: Enter Vendor Legal Name

By: _____

Surety:

By: _____

Agent's Name: _____

Agent's Address: _____

SAMPLE



PERFORMANCE BOND TO THE CITY OF TACOMA

Resolution No.
Bond No.

That we, the undersigned,

as principal, and

as a surety, are jointly and severally held and firmly bound to the CITY OF TACOMA, in the penal sum of

\$ _____, for the payment whereof Contractor and Surety bind themselves,

their executors, administrators, legal representatives, successors and assigns, jointly and severally, firmly by these presents.

This obligation is entered into in pursuance of the statutes of the State of Washington, the Ordinances of the City of Tacoma.

WHEREAS, under and pursuant to the City Charter and general ordinances of the City of Tacoma, the said City has or is about to enter with the above bounden principal, a contract, providing for

Specification No. _____

Specification Title: _____

Contract No. _____

(which contract is referenced to herein and is made a part hereof as though attached hereto), and

WHEREAS, the said principal has accepted, the said contract, and undertake to perform the work therein provided for in the manner and within the time set forth.

This statutory performance bond shall become null and void, if and when the principal, its heirs, executors, administrators, successors, or assigns shall well and faithfully perform all of the Principal's obligations under the Contract and fulfill all terms and conditions of all duly authorized modifications, additions and changes to said Contract that may hereafter be made, at the time and in the manner therein specified; and if such performance obligations have not been fulfilled, this bond shall remain in force and effect.

The Surety for value received agrees that no change, extension of time, alteration or addition to the terms of the Contract, the specifications accompanying the Contract, or to the work to be performed under the Contract shall in any way affect its obligation on this bond, and waives notice of any change, extension of time, alteration or addition to the terms of the Contract or the work performed. The Surety agrees that modifications and changes to the terms and conditions of the Contract that increase the total amount to be paid the Principal shall automatically increase the obligation of the Surety on this bond and notice to Surety is not required for such increase.

If the City shall commence suit and obtain judgment against the Surety for recovery hereunder, then the Surety, in addition to such judgement, shall pay all costs and attorney's fees incurred by the City in enforcement of its rights hereunder. Venue for any action arising out of in connection with this bond shall be in Pierce County, Washington.

Surety companies executing bonds must be authorized to transact business in the State of Washington as surety and named in the current list of "Surety Companies Acceptable in Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Department of the Treasury.

One original bond shall be executed, and signed by the parties' duly authorized officers. This bond will only be accepted if it is accompanied by a fully executed power of attorney for the office executing on behalf of the surety.

Principal: Enter Vendor Legal Name

By: _____

Surety:

By: _____

Agent's Name: _____

Agent's Address: _____

GENERAL RELEASE TO THE CITY OF TACOMA

The undersigned, named as the contractor for _____
between _____ and the City of Tacoma,
dated _____, 20____, hereby releases the City of
Tacoma, its departmental officers and agents from any and all claim or claims
whatsoever in any manner whatsoever at any time whatsoever arising out of and/or in
connection with and/or relating to said contract, excepting only the equity of the
undersigned in the amount now retained by the City of Tacoma under said contract, to-
wit the sum of \$_____.

Signed at Tacoma, Washington this _____ day of _____, 20____.

Contractor

By _____

Title _____

P A R T I I

GENERAL PROVISIONS

GENERAL PROVISIONS

(Revised December 15, 2020)

SECTION I - BIDDING REQUIREMENTS

SECTION I REQUIREMENTS ARE BINDING ON ALL RESPONDENTS.

1.01 USE AND COMPLETION OF CITY PROPOSAL SHEETS

A. Respondent's Proposal

Each Respondent must bid exactly as specified on the Proposal sheets. All proposals must remain open for acceptance by the City for a period of at least 60 calendar days from the date of opening of the bids.

B. Alterations of Proposals Not Allowed

Proposals that are incomplete or conditioned in any way contain alternatives or items not called for in the General Provisions and Specifications, or not in conformity with law may be rejected as being nonresponsive. The City cannot legally accept any proposal containing a substantial deviation from these Specifications.

C. Filling Out City Proposal Sheets

All proposals must be completed using the proposal sheets and forms included with this specification, and the prices must be stated in figures either written in ink or typewritten. No proposal having erasures or interlineations will be accepted unless initialed by the Respondent in ink.

1.02 CLARIFICATION OF PROPOSAL FOR RESPONDENT

If a prospective Respondent has any questions concerning any part of the Proposal, he/she may submit a written request for answer of his/her questions. Any interpretation of the Proposal will be made by an Addendum duly issued and mailed or delivered to each prospective Respondent. Such addendum must be acknowledged in the proposal. The City of Tacoma will not be responsible for any other explanation or interpretation of the bid documents.

1.03 RESPONDENT'S BOND OR CERTIFIED CHECK

Each bid for construction must be accompanied either by a certified or cashier's check for 5 percent of the total amount bid, including tax, payable to the City Treasurer, or an approved bid bond, by a surety company authorized to do business in the State of Washington, for 5 percent of the total amount bid. The person legally authorized to sign the bid must sign all bid bonds. The approved bid bond form attached to these Specifications should be used: no substantial variations from the language thereof will be accepted.

If a bid bond is used, the 5 percent may be shown either in dollars and cents, or the bid bond may be filled in as follows, "5 percent of the total amount of the accompanying proposal."

The check of the successful Respondent will be returned after award of the Contract, acceptance of the Payment and Performance Bond and City's receipt of the signed Contract. The checks of all other Respondents will be returned immediately upon the award of the Contract. Bid bonds will not be returned.

1.04 DELIVERY OF PROPOSALS TO THE CITY'S PURCHASING OFFICE

- A.** Proposal packages must be received by the City's Procurement and Payables Division in SAP Ariba (unless another form of delivery is stated), prior to the scheduled time and date stated in the Solicitation.
- B.** Supplier is solely responsible for timely delivery of its Submittal.
- C.** Submittals received after the time stated in the solicitation will not be accepted.
- D.** For purposes of determining whether a Submittal has been timely received in SAP Ariba, the City's Procurement and Payables Division will rely on the submittal clock in SAP Ariba.

1.05 LICENSES/PERMITS

- A.** Suppliers, if applicable, must have a Washington state business license at the time of Submittal and throughout the term of the Contract. Failure to include a Washington state business license may be grounds for rejection of the Submittal or cancellation of contract award. Information regarding Washington state business licenses may be obtained at <http://bls.dor.wa.gov>.
- B.** Upon award, it is the responsibility of the Supplier to register with the City of Tacoma's Tax and License Division, 733 South Market Street, Room 21, Tacoma, WA 98402-3768, 253-591-5252, https://www.cityoftacoma.org/government/city_departments/finance/tax_and_license/. Supplier shall obtain a business license as is required by Tacoma Municipal Code Subtitle 6C.20.
- C.** During the term of the Contract, Supplier, at its expense, shall obtain and keep in force any and all necessary licenses and permits.

1.06 CONTRACTOR'S STATE REGISTRATION NUMBER

Contractors for construction or public works construction are required to be licensed by the state. If the provisions of Chapter 18.27 of the Revised Code of Washington apply to the Respondent, then the Respondent's Washington State Contractor's Registration No. must accompany the bid.

1.07 BID IS NONCOLLUSIVE

The Respondent represents by the submission of the Proposal that the prices in this Bid are neither directly nor indirectly the result of any formal or informal agreement with another Respondent.

1.08 EVALUATION OF BID

A. Price, Experience, Delivery Time and Responsibility

In the evaluation of bids, the Respondent's experience, delivery time, quality of performance or product, conformance to the specifications and responsibility in performing other contracts (including satisfying all safety requirements) may be considered in addition to price. In addition, the bid evaluation factors set forth in City Code Section 1.06.262 may be considered by the City. Respondents who are inexperienced or who fail to properly perform other contracts may have their bids rejected for such cause.

B. Prequalified Electrical Contractor

Certain types of electrical construction require special expertise, experience, and prequalification of the Contractor (or subcontractor) by the City. In such cases, the Respondent must be prequalified or the Respondent must subcontract with a City prequalified electrical contractor for the specialty work.

C. Insertions of Material Conflicting with Specifications

Only material inserted by the Respondent to meet requirements of the Specifications will be considered. Any other material inserted by the Respondent will be disregarded as being nonresponsive and may be grounds for rejection of the Respondent's Proposal.

D. Correction of Ambiguities and Obvious Errors

The City reserves the right to correct obvious errors in the Respondent's proposal. In this regard, if the unit price does not compute to the extended total price, the unit price shall govern.

1.09 WITHDRAWAL OF BID

A. Prior to Bid Opening

Any Respondent may withdraw his/her Proposal prior to the scheduled bid opening time by delivering a written notice to the City's Procurement and Payables Office. The notice may be submitted in person or by mail; however, it must be received by the City's Procurement and Payables Office prior to the time of bid opening.

B. After Bid Opening

No Respondent will be permitted to withdraw his/her Proposal after the time of bid opening, as set forth in the Call for Bids, and before the actual award of the Contract, unless the award of Contract is delayed more than sixty (60) calendar days after the date set for bid opening. If a delay of more than 60 calendar days does occur, then the Respondent must submit written notice withdrawing his/her Proposal to the Purchasing Manager.

1.10 OPENING OF BIDS

At the time and place set for the opening of bids, all Proposals, unless previously withdrawn, will be publicly opened and read aloud, irrespective of any irregularities or informalities in such Proposal.

1.11 CITY COUNCIL/PUBLIC UTILITY BOARD FINAL DETERMINATION

The City Council or Public Utility Board of the City of Tacoma shall be the final judge as to which is the lowest and best bid in the interest of the City of Tacoma. The City reserves the right to reject any and all bids, waive minor deviations or informalities, and if necessary, call for new bids.

1.12 RESPONDENT'S REFUSAL TO ENTER INTO CONTRACT

Any Respondent who refuses to enter into a Contract after it has been awarded to the Respondent will be in breach of the agreement to enter the Contract and the Respondent's certified or cashier's check or bid bond shall be forfeited.

1.13 TAXES

A. Include In Proposal All Taxes

Respondent shall include in his/her Proposal all applicable local, city, state, and federal taxes. It is the Respondent's obligation to state on his/her Proposal sheet the correct percentage and total applicable Washington State and local sales tax. The total cost to the City including all applicable taxes may be the basis for determining the low Respondent.

B. Federal Excise Tax

The City of Tacoma is exempt from federal excise tax. Where applicable, the City shall furnish a Federal Excise Tax Exemption certificate.

C. City of Tacoma Business and Occupation Tax

Sub-Title 6A of the City of Tacoma Municipal Code (TMC) provides that transactions with the City of Tacoma, may be subject to the City of Tacoma's Business and Occupation Tax. It is the responsibility of the Respondent awarded the Contract to register with the City of Tacoma's Department of Tax and License, 733 South Market Street, Room 21, Tacoma, WA 98402-3768, telephone 253-591-5252. The City's Business and Occupation Tax amount shall not be shown separately but shall be included in the unit and/or lump sum prices bid.

1.14 FIRM PRICES/ESCALATION

Except as specifically allowed by the Special Provisions, only firm prices will be accepted.

1.15 AWARD

A. Construction and/or Labor Contracts

Unless specifically noted in the Special Provisions or Proposal sheets, all construction and/or labor contracts will be awarded to only one Respondent.

B. Supply/Equipment Contracts

The City reserves the right to award an equipment or supply contract for any or all items to one or more Respondents as the interests of the City will be best satisfied.

1.16 INCREASE OR DECREASE IN QUANTITIES

The City of Tacoma reserves the right to increase or decrease the quantities of any items under this Contract and pay according to the unit prices quoted in the Proposal (with no adjustments for anticipated profit).

1.17 EXTENSION OF CONTRACT

Contracts resulting from this specification shall be subject to extension by mutual agreement per the same prices, terms and conditions.

1.18 PAYMENT TERMS

- A. Prices will be considered as net 30 calendar days if no cash discount is shown. Payment discount periods of twenty (20) calendar days or more if offered in the submittal, will be considered in determining the apparent lowest responsible submittal. Discounts will be analyzed in context of their overall cumulative effect. Invoices will not be processed for payment nor will the period of cash discount commence until receipt of a properly completed invoice and until all invoiced items are received and satisfactory performance of the Contractor has been attained. If an adjustment in payment is necessary due to damage or dispute, the cash discount period shall commence on the date final approval for payment is authorized.
- B. ePayable/Credit Card Acceptance. Submittals offering ePayable/Credit card acceptance may be compared against submittals offering a prompt payment discount to evaluate the overall cumulative effect of the discount against the advantage to the City of the ePayable/Credit card acceptance, and may be considered in determining the apparent lowest responsible submittal.

1.19 PAYMENT METHOD – EPAYABLES – CREDIT CARD ACCEPTANCE – EFT/ACH ACCEPTANCE

- A. Payment methods include:
- EPayables (Payment Plus). This is payment made via a virtual, single use VISA card number provided by the City's commercial card provider. Suppliers accepting this option will receive "due immediately" payment terms. Two options for acceptance are available to suppliers. Both are accompanied by an emailed advice containing complete payment details:
 - Straight-through processing (buyer initiated). Immediate, exact payments directly deposited to supplier accounts by the City's provider bank; the supplier does not need to know card account details.
 - Supplier retrieves card account through the secure, on-line portal provided via email notifications sent by the City's commercial card provider.
 - Credit card. Tacoma's VISA procurement card program is supported by standard bank credit suppliers and requires that merchants abide by the VISA merchant operating rules. It provides "due immediately" payment terms.
 - Suppliers must be PCI-DSS compliant (secure credit card data management) and federal FACTA (sensitive card data display) compliant.
 - Suppliers must be set up by their card processing equipment provider (merchant acquirer) as a minimum of a Level II merchant with the ability to pass along tax, shipping and merchant references information.
 - Electronic Funds Transfer (EFT) by Automated Clearing House (ACH). Standard terms are net 30 for this payment method.
 - Check or other cash equivalent. Standard terms are net 30 for this payment method.
- B. The City's preferred method of payment is by ePayables (Payment Plus) followed by credit card (aka procurement card). Suppliers may be required to have the capability of accepting the City's ePayables or credit card methods of payment. **The City of Tacoma will not accept price changes or pay additional fees when ePayables (Payment Plus) or credit card is used.**
- C. The City, in its sole discretion, will determine the method of payment for goods and/or services as part of the Contract.

1.20 COOPERATIVE PURCHASING

The Washington State Interlocal Cooperative Act RCW 39.34 provides that other governmental agencies may purchase goods and services on this solicitation or contract in accordance with the terms and prices indicated therein if all parties are agreeable.

1.21 PUBLIC DISCLOSURE: PROPRIETARY OR CONFIDENTIAL INFORMATION

- A. Respondent's Submittals, all documents and records comprising any Contract awarded to Respondent, and all other documents and records provided to the City by Respondent are deemed public records subject to disclosure under the Washington State Public Records Act, Chapter 42.56 RCW (Public Records Act). Thus, City may be required, upon request, to disclose the Contract and documents or records related to it unless an exemption under the Public Records Act or other laws applies. In the event CITY receives a request for such disclosure, determines in its legal judgment that no applicable exemption to disclosure applies; and Respondent has complied with the requirements to mark records considered confidential or proprietary

as such requirements are stated below, City agrees to provide Respondent 10 days written notice of impending release. Should legal action thereafter be initiated by Respondent to enjoin or otherwise prevent such release, all expense of any such litigation shall be borne by Respondent, including any damages, attorneys' fees or costs awarded by reason of having opposed disclosure. City shall not be liable for any release where notice was provided and Respondent took no action to oppose the release of information.

B. If Respondent provides City with records or information that Respondent considers confidential or proprietary, Respondent must mark all applicable pages or sections of said record(s) as "Confidential" or "Proprietary." Further, in the case of records or information submitted in response to a Request for Proposals, an index must be provided indicating the affected pages or sections and locations of all such material identified Confidential or Proprietary. Information not included in the required index will not be reviewed for confidentiality or as proprietary before release. If Supplier fails to so mark or index Submittals and related records, then the City, upon request, may release said record(s) without the need to satisfy the requirements of subsection A above; and Respondent expressly waives its right to allege any kind of civil action or claim against the City pertaining to the release of said record(s). Submission of materials in response to City's Solicitation shall constitute assent by Respondent to the foregoing procedure and Respondent shall have no claim against the City on account of actions taken pursuant to such procedure.

1.22 FEDERAL AID PROJECTS

The City of Tacoma 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 as defined at 49 CFR, part 26, 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, national origin, or sex in consideration for an award.

SECTION II - CONTRACT REQUIREMENTS

2.01 CONTRACTOR'S RESPONSIBILITY

A. Contract Documents

The Respondent to whom the Contract is awarded, hereinafter called the Contractor, shall enter into a Contract with the City of Tacoma, , within 10 days after receipt from the City of Tacoma of a properly prepared Contract. In addition, the Contractor will do all things required to promptly perform this Contract pursuant to the terms of this Contract. Certain contracts for supplies, goods or equipment may use the City Purchase Order in place of a formal contract document.

B. Surety Bonds

Except as modified by the Special Provisions, the Respondent to whom the Contract is awarded shall provide a payment and performance bond, including power of attorney, for 100 percent of the amount of his/her bid (including sales taxes), to insure complete performance of the Contract including the guarantee. The bonds must be executed by a surety company licensed to do business in the State of Washington. For a supply-type contract, a cashier's check or cash may be substituted for the bonds; however, this cash or cashier's check must remain with the City through the guarantee period and any interest on said amount shall accrue to the City.

C. Independent Contractor

Contractor is an independent contractor; no personnel furnished by the Contractor shall be deemed under any circumstances to be the agent or servant of the City. Contractor shall be fully responsible for all acts or omissions of Subcontractors and its and their suppliers and of persons employed by them, and shall be specifically responsible for sufficient and competent supervision and inspection to assure compliance in every respect with the Contract. There shall be no contractual relationship between any Subcontractors or supplier and the City arising out of or by virtue of this agreement. No provision of the Contract is intended or is to be construed to be for the benefit of any third party.

2.02 CONFLICTS IN SPECIFICATIONS

Anything mentioned in the Specifications and not shown on the Drawings and anything on the Drawings and not mentioned in the Specifications shall be of like effect and shall be understood to be shown and/or mentioned in both. In case of differences between Drawings and Specifications, the Specifications shall govern. In addition, in the event of any conflict between these General Provisions, the Special Provisions, the Technical Provisions and/or the Proposal pages, the following order of precedence shall control:

1. Proposal pages prevail if they conflict with the General, Special or Technical Provisions.
2. Special Provisions prevail if they conflict with the General Provisions and/or Technical Provisions.
3. Technical Provisions prevail if they are in conflict with the General Provisions.

In case of discrepancy of figures between Drawings, Specifications or both, the matter shall immediately be submitted to the Engineer for determination. Failure to submit the discrepancy issue to the Engineer shall result in the Contractor's actions being at his/her own risk and expense. The Engineer shall furnish from time to time such detailed drawings and other information as he/she may consider necessary.

2.03 INSPECTION

A. Of the Work

All materials furnished and work done shall be subject to inspection.

The Inspector administering the Contract shall at all times have access to the work wherever it is in progress or being performed, and the Contractor shall provide proper facilities for such access and inspection. Such inspection shall not relieve the Contractor of the responsibility of performing the work correctly, utilizing the best labor and materials in strict accordance with the Specifications of this Contract. All material or work approved and later found to be defective shall be replaced without cost to the City of Tacoma.

B. Inspector's Authority

The inspector shall have power to reject materials or workmanship which do not fulfill the requirements of these Specifications, but in case of dispute the Contractor may appeal to the Director or Superintendent, whose decision shall be final. The word "Director" means the Director of the City of Tacoma General Government department that is administering the contract. The word "Superintendent" means the Superintendent of the City of Tacoma, Department of Public Utilities Division that is administering the contract.

The Contract shall be carried out under the general control of the representative of the particular City Department or Division administering the Contract, who may exercise such control over the conduct of the work as may be necessary, in his or her opinion, to safeguard the interest of the City of Tacoma. The Contractor shall comply with all orders and instructions given by the representative of the particular Department or Division administering the Contract in accordance with the terms of the Contract.

Provided, that for the purposes of construction contracts, such control shall only apply (a) to the extent necessary to ensure compliance with the provisions of this contract, and (b) to the extent necessary to fulfill any nondelegable duty of the City for the benefit of third parties not engaged in promoting the activity of this contract.

Nothing herein contained, however, shall be taken to relieve the Contractor of his/her obligations or responsibilities under the Contract.

2.04 FEDERAL, STATE AND MUNICIPAL REGULATIONS

All federal, state, municipal and/or local regulations shall be satisfied in the performance of all portions of this Contract. The Contractor shall be solely responsible for all violations of the law from any cause in connection with work performed under this Contract.

2.05 INDEMNIFICATION

A. Indemnification

Contractor acknowledges that pursuant to the terms of this agreement, Contractor is solely and totally responsible for the safety of all persons and property in the performance of this Contract. To the greatest extent allowed by law, Contractor assumes the risk of all damages, loss, cost, penalties and expense and agrees to indemnify, defend and hold harmless the City of Tacoma, from and against any and all liability which may accrue to or be sustained by the City of Tacoma on account of any claim, suit or legal action made or brought against the City of Tacoma for the death of or injury to persons (including Contractor's or subcontractor's employees) or damage to property involving Contractor, or subcontractor(s) and their employees or agents, arising out of and in connection with or incident to the performance of the Contract including if the City is found to have a nondelegable duty to see that work is performed with requisite care, except for injuries or damages caused by the sole negligence of the City. In this regard, Contractor recognizes that Contractor is waiving immunity under industrial Insurance Law, Title 51 RCW. This indemnification extends to the officials, officers and employees of the City and also includes attorney's fees and the cost of establishing the right to indemnification hereunder in favor of the City of Tacoma. In addition, within the context of competitive bidding laws, it is agreed that this indemnification has been mutually negotiated. Provided however, this provision is intended to be applicable to the parties to this agreement and it shall not be interpreted to allow a Contractor's employee to have a claim or cause of action against Contractor.

B. Limitation of Liability for Primarily Supply-Type Contracts

In all contracts where the total cost of the supply of materials and/or equipment constitute at least 70 percent of the total contract price (as determined by the City), the City agrees that it will not hold the contractor, supplier or manufacturer liable for consequential damages for that part of the contract related to the manufacture and/or design of the equipment, materials or supplies.

2.06 CONTRACTOR'S INSURANCE

A. During the course and performance of a Contract, Contractor will provide proof and maintain the insurance coverage in the amounts and in the manner specified in the City of Tacoma Insurance Requirements as is applicable to the services, products, and deliverables provided under the Contract. The City of Tacoma Insurance Requirements document, if issued, is fully incorporated into the Contract by reference.

B. Failure by City to identify a deficiency in the insurance documentation provided by Contractor or failure of City to demand verification of coverage or compliance by Contractor with these insurance requirements shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

2.07 ASSIGNMENT AND SUBLETTING OF CONTRACT

C. Assignment

The Contract shall not be assigned except with the consent of the Superintendent or his/her designee.

Requests for assignment of this contract must be in writing with the written consent of the surety, and the request must show the proposed person or organization to which the contract is assigned is capable, experienced and equipped to perform such work. The proposed substitute person or organization may be required to submit to the City information as to his/her experience, financial ability and give statements covering tools, equipment, organization, plans and methods to fulfill any portion of the Contract prior to approval of assignment.

D. Subletting

The Contract shall not be sublet except with the written consent of the Superintendent or his/her designee. In the event that a prequalified electrical contractor is necessary to perform certain portions of the work, such work may be subcontracted with a City prequalified electrical contractor for the type of work involved.

Requests for subletting of this Contract must be in writing with the written consent of the Surety, and the request must show the proposed person or organization to which the Contract is sublet is capable, experienced and equipped to perform such work. The proposed substitute person or organization may be required to submit to the City information as to his experience, financial ability and give statements covering tools, equipment, organization, plans and methods to fulfill any portion of the Contract prior to approval of subletting.

The written consent approving the subletting of the Contract shall not be construed to relieve the Contractor of his/her responsibility for the fulfillment of the Contract. The Subcontractor shall be considered to be the agent of the Contractor and the Contractor agrees to be responsible for all the materials, work and indebtedness incurred by the agent.

A subcontractor shall not sublet any portion of a subcontract for work with the City without the written consent of the City.

2.08 DELAY

E. Extension of Time

With the written approval of the Superintendent or his/her designee, the Contractor may be granted additional time for completion of the work required under this Contract, if, in the Superintendent's opinion the additional time requested arises from unavoidable delay.

F. Unavoidable Delay

Unavoidable delays in the prosecution of the work shall include only delays from causes beyond the control of the Contractor and which he/she could not have avoided by the exercise of due care, prudence, foresight and diligence. Delay caused by persons other than the Contractor, Subcontractors or their employees will be considered unavoidable delays insofar as they necessarily interfere with the Contractor's completion of the work, and such delays are not part of this Contract.

Unavoidable delay will not include delays caused by weather conditions, surveys, measurements, inspections and submitting plans to the Engineer of the particular Division involved in administering this Contract.

2.09 GUARANTEE

A. Guarantee for Construction, Labor or Services Contract

Neither the final certificate of payment or any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

If it has been discovered, before payment is required under the terms of the Contract, that there is a failure to comply with any of the terms and provisions of this Contract, the City has the right and may withhold payment.

In case of a failure of any part of the work, materials, labor and equipment furnished by the Contractor or to fully meet all of the requirements of the Contract, the Contractor shall make such changes as may be necessary to fully meet all of the specifications and requirements of this Contract. Such changes shall be made at the Contractor's sole cost and expense without delay and with the least practicable inconvenience to the City of Tacoma. Rejected material and equipment shall be removed from the City's property by and at the expense of the Contractor.

B. Guarantee for Supply Contracts

Unless a longer period is specified, the supplier and/or manufacturer of the supplies, materials and/or equipment furnished pursuant to this Contract agrees to correct any defect or failure of the supplies, materials and/or equipment which occurs within one year from the date of: (1) test energization if electrical or mechanical equipment; (2) commencement of use if supplies or materials, provided, however, said guarantee period shall not extend beyond eighteen months after date of receipt by the City. All of the costs (including shipping, dismantling and reinstallation) of repairs and/or corrections of defective or failed equipment, supplies and/or material is the responsibility of the supplier and/or manufacturer.

When the supplier is not the manufacturer of the item of equipment, supplier agrees to be responsible for this guarantee and supplier is not relieved by a manufacturer's guarantee.

C. Guarantee Period Extension

The Contract guarantee period shall be suspended from the time a significant defect is first documented by the City until the work or equipment is repaired or replaced by Contractor and accepted by the City. In addition, in the event less than ninety (90) days remain on the guarantee period (after recalculating), the guarantee period shall be extended to allow for at least ninety (90) days from the date the work or equipment is repaired or replaced and accepted by the City.

2.10 DEDUCTIONS FOR UNCORRECTED WORK

If the City of Tacoma deems it expedient to correct work not done in accordance with the terms of this Contract, an equitable deduction from the Contract price shall be made.

2.11 CITY OF TACOMA'S RIGHT TO TERMINATE CONTRACT

A. Termination for Convenience

1. Supplies. The City may terminate a Contract for supplies at any time upon prior written notice to Contractor. Upon the effective date of termination specified in such notice, and payment by the City, all conforming supplies, materials, or equipment previously furnished hereunder shall become its property.
2. Services. The City may terminate a Contract for services at any time, with or without cause, by giving 10-business day's written notice to Supplier. In the event of termination, all finished and unfinished work prepared by Supplier pursuant to the Contract shall be provided to the City. In the event City terminates the Contract due to the City's own reasons and without cause due to Supplier's actions or omissions, the City shall pay Supplier the amount due for actual work and services necessarily performed under the Contract up to the effective date of termination, not to exceed the total compensation set forth in the Contract.

B. Termination for Cause

1. The City may terminate a Contract for either services or supplies in the event of any material breach of any of the terms and conditions of the Contract if the Contractor's breach continues in effect after written notice of breach and 30 days to cure such breach and fails to cure such breach
2. Bankruptcy. If the Contractor should be adjudged as bankrupt, or makes a general assignment for the benefit of creditors, or a receiver should be appointed on account of his/her insolvency, or if he/she or any of his/her subcontractors should violate any of the provisions of the Contract, or if the work is not being properly and diligently performed, the City of Tacoma may serve written notice upon the Contractor and Surety, executing the Payment and Performance Bond, of its intention to terminate the Contract; such notice will contain the reasons for termination of the Contract, and unless within 10 days after the serving of such notice, such violation shall cease and an arrangement satisfactory to the City of Tacoma for correction thereof shall be made, the Contract shall, upon the expiration of said 10 days, cease and terminate and all rights of the Contractor hereunder shall be forfeited. In the event the Contract is terminated for cause, Contractor shall not be entitled to any lost profits resulting therefrom.
3. Notice. In the event of any such termination for cause, the City of Tacoma shall immediately send (by regular mail or other method) written notice thereof to the Surety and the Contractor. Upon such termination the Surety shall have the right to take over and perform the Contract, provided however, the Surety must provide written notice to the City of its intent to complete the work within 15 calendar days of its receipt of the original written notice (from the City) of the intent to terminate. Upon termination and if the Surety does not perform the work, the City of Tacoma may take over the work and prosecute the same to completion by any method it may deem advisable, for the account of and at the expense of the Contractor, and the Contractor and the Surety shall be liable to the City of Tacoma for all cost occasioned to the City of Tacoma thereby. The City of Tacoma may without liability for doing so, take possession of and utilize in completing the work, such materials, equipment, plant and other property belonging to the Contractor as may be on the site of the work and necessary therefore.

2.12 LIENS

In the event that there are any liens on file against the City of Tacoma, the City of Tacoma shall be entitled to withhold final or progress payments to the extent deemed necessary by the City of Tacoma to properly protect the outstanding lien claimants until proper releases have been filed with the City Clerk.

2.13 LEGAL DISPUTES

A. General

Washington law shall govern the interpretation of the Contract. The state or federal courts located in Pierce County Washington shall be the sole venue of any mediation, arbitration, or litigation arising out of the Contract.

Respondents providing submittals from outside the legal jurisdiction of the United States of America will be subject to Tacoma's City Attorney's Office (CAO) opinion as to the viability of possible litigation pursuant to a contract resulting from this Specification. If it is the opinion of the CAO that any possible litigation would be beyond reasonable cost and/or enforcement, the submittal may be excluded from evaluation.

B. Attorney Fees

For contracts up to \$250,000, which become the subject of litigation or arbitration, the substantially prevailing party may be entitled to reasonable attorney fees, as provided in RCW 39.04.240. Provided, however, the attorney fee hourly rate for the City of Tacoma's assistant city attorneys is agreed to be \$150 per hour or the same as the hourly rate for Contractor's legal counsel, whichever is greater.

2.14 DELIVERY

Prices must be quoted F.O.B. destination, freight prepaid and allowed with risk of loss during transit remaining with Contractor/Supplier (unless otherwise stated in these Specifications) to the designated address set forth in these Specifications.

Deliveries shall be between 9:00 a.m. and 3:30 p.m.; Monday through Friday only (except legal holidays of the City of Tacoma).

Legal holidays of the City of Tacoma are:

New Year's Day	January 1
Martin Luther King's Birthday	3rd Monday in January
Washington's Birthday	3rd Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4
Labor Day	1st Monday in September
Veteran's Day	November 11
Thanksgiving Day	4th Thursday of November
Day after Thanksgiving	4th Friday of November
Christmas Day	December 25

When any of these holidays occur on Saturday or Sunday, the preceding Friday or the following Monday, respectively, is a legal holiday for the City of Tacoma.

2.15 PACKING SLIPS AND INVOICES

A. Packing slips and shipping notices shall be sent to the specific City Division or Department receiving the item(s) at the address stated in City's Solicitation or as otherwise stated in the Contract and include complete description of items, contents of items if crated or cased, quantity, shipping point, carrier, bill of lading number and City of Tacoma purchase order.

B. Each invoice shall show City of Tacoma purchase order number, release number if applicable, quantity, unit of measure, item description, unit price and extended price for each line if applicable, services and deliverables provided if applicable. Line totals shall be summed to give a grand total to which sales tax shall be added, if applicable.

1. For transactions conducted in SAP Ariba, invoices shall be submitted through Ariba.
2. For invoices paid by ACH or by check, unless stated otherwise, invoices shall be electronically submitted by email with corresponding PO number listed in the subject line to accountspayable@cityoftacoma.org.

3. For invoices paid by credit card, invoices shall also display the last name of the cardholder and last four digits (only) of the card number (e.g., Jones/6311). Unless stated otherwise, invoices shall be electronically submitted by email with corresponding PO number listed in the subject line to (do not combine different POs into one invoice or charge) to pcardadmin@cityoftacoma.org.

2.16 APPROVED EQUALS

A. Unless an item is indicated as "No substitute", special brands, when named, are intended to describe the standard of quality, performance or use desired. Equal items will be considered by the City, provided that the respondent specifies the brand and model, and provides all descriptive literature, independent test results, product samples, local servicing and parts availability to enable the City to evaluate the proposed "equal".

B. The decision of the City as to what items are equal shall be final and conclusive. If the City elects to purchase a brand represented by the respondent to be an "equal", the City's acceptance of the item is conditioned on the City's inspection and testing after receipt. If, in the sole judgment of the City, the item is determined not to be an equal, the item shall be returned at the respondent's expense.

C. When a brand name or level of quality is not stated by the respondent, it is understood the offer is exactly as specified. If more than one brand name is specified, respondents must clearly indicate the brand and model/part number being bid.

2.17 ENTIRE AGREEMENT

This written contract represents the entire Agreement between the parties and supersedes any prior oral statements, discussions or understandings between the parties.

2.18 CODE OF ETHICS

The City's Code of Ethics, Chapter 1.46, Tacoma Municipal Code, provides ethical standards for City personnel and prohibits certain unethical conduct by others including respondents and contractors. Violation of the City's Code of Ethics will be grounds for termination of this contract.

2.19 FEDERAL FINANCIAL ASSISTANCE

If federal funds, including FEMA financial assistance to the City of Tacoma, will be used to fund, pay or reimburse all or a portion of the Contract, Contractor will comply with all applicable Federal law, regulations, executive orders, FEMA policies, procedures, and directives and the following clauses will be incorporated into the Contract:

A. EQUAL EMPLOYMENT OPPORTUNITY During the performance of this Contract, Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

1. Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3. The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other

employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
5. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
6. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
7. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
8. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency 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 vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

B. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (B)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (B)(1) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

3. Withholding for unpaid wages and liquidated damages. The City shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (B)(2) of this section.
4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (B)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (B)(1) through (4) of this section.

C. CLEAN AIR ACT

1. Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
2. Contractor agrees to report each violation to the City and understands and agrees that the City will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3. Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

D. FEDERAL WATER POLLUTION CONTROL ACT

1. Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
2. Contractor agrees to report each violation to the City, understands, and agrees that the City will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3. Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

E. DEBARMENT AND SUSPENSION

1. This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
2. Contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
3. This certification is a material representation of fact relied upon by the City. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to (insert name of recipient/subrecipient/applicant), the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
4. Contractor agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

F. BYRD ANTI-LOBBYING AMENDMENT

1. Contractors who apply or bid for an award of \$100,000 or more shall file the required certification with City. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the City.
2. If applicable, Contractor must sign and submit to the City the following certification:

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap.38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Date

G. PROCUREMENT OF RECOVERED MATERIALS

1. In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired:
 - a. Competitively within a timeframe providing for compliance with the contract performance schedule;
 - b. Meeting contract performance requirements; or
 - c. At a reasonable price.
2. Information about this requirement, along with the list of EPA- designated items, is available at EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.
3. Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

[Section III is for contracts that involve construction and/or labor, and are not applicable to contracts solely for material/supply purchases.]

GENERAL PROVISIONS

SECTION III - CONSTRUCTION AND/OR LABOR CONTRACTS

SECTION III REQUIREMENTS APPLY ONLY TO CONSTRUCTION AND/OR LABOR CONTRACTS AND ARE IN ADDITION TO APPLICABLE REQUIREMENTS CONTAINED IN SECTION II CONTRACT REQUIREMENTS.

3.01 RESPONDENT'S DUTY TO EXAMINE

The Respondent agrees to be responsible for examining the site(s) and to have compared them with the Specifications and Contract Drawings, and to be satisfied as to the facilities and difficulties attending the execution of the proposed Contract (such as uncertainty of weather, floods, nature and condition of materials to be handled and all other conditions, obstacles and contingencies) before the delivery of his/her Proposal. No allowance will be subsequently made by the City on behalf of the Respondent by reason of any error or neglect on Respondent's part, for such uncertainties as aforesaid.

3.02 PERMITS

Except when modified by the Special Provisions, the Contractor shall procure and pay for all permits and licenses necessary for the completion of this Contract including those permits required by the City of Tacoma. The City will obtain county or state road crossing permits if required. In the event a necessary permit is not obtained, the Contractor will not be permitted to work on items subject to said permit and any delays caused thereby will not be subject to extra compensation or extensions.

3.03 NOTIFICATION OF OTHER GOVERNMENTAL AGENCIES AND UTILITIES WHEN UNDERGROUND WORK IS INVOLVED

The Contractor shall notify all other affected governmental agencies and utilities whenever underground work is done under the terms of this Contract. The Contractor is required to obtain permission of the appropriate public and private utilities and governmental agencies before performing underground work pursuant to the terms of this Contract. The Contractor is required to call "one call" at 1-800-424-5555 for all work involving excavation or digging more than 12 inches beneath ground or road surface.

The City may have indicated on the plans and specifications the existence of certain underground facilities that are known to the City department responsible for this Contract. It is the Contractor's responsibility to fully comply with the Underground Utility Locate Law, Chapter 19.122 RCW. If the site conditions are "changed or differing" as defined by RCW 19.122.040(l), the Contractor may pursue the party responsible for not properly marking or identifying the underground facility. The Contractor agrees not to file any claim or legal action against the City (department responsible for this Contract) for said "changed or differing" conditions unless said City department is solely responsible for the delay or damages that the Contractor may have incurred.

3.04 TRENCH EXCAVATION BID ITEM

In the event that "trench excavation" in excess of four feet requires a safety system pursuant to Washington State law and safety shoring, sloping, sheeting, or bracing is used, a separate bid item should be set forth in the Proposal for this work. If a separate bid item is not set forth in the Proposal pages, said installed safety system shall be paid at \$3.00 per lineal foot of trench, which unit price includes both sides of the trench.

3.05 SAFETY

A. General

The Contractor shall, at all times, exercise adequate precautions for the safety of all persons, including its employees and the employees of a Subcontractor, in the performance of this Contract and shall comply with all applicable provisions of federal, state, county and municipal safety laws and regulations. It is the Contractor's responsibility to furnish safety equipment or to contractually require Subcontractors to furnish adequate safety equipment relevant to their responsibilities.

The Contractor shall obtain the necessary line clearance from the inspector before performing any work in, above, below or across energized Light Division circuits.

The Inspector and/or Engineer may advise the Contractor and the Safety Officer of any safety violations. It is the Contractor's responsibility to make the necessary corrections. Failure to correct safety violations is a breach of this Contract and, as such, shall be grounds for an order from the Safety Officer, Inspector or Engineer to cease further work and remove from the job site until the condition is corrected. Time and wages lost due to such safety shutdowns shall not relieve the Contractor of any provisions of Section 3.14 of this Specification and shall be at the sole cost of the Contractor. The purpose of this authority to stop work is to enforce the contract and not to assume control except to the extent necessary to ensure compliance with the provisions of this contract.

Any of the above actions by employees of the City of Tacoma shall in no way relieve the Contractor of his/her responsibility to provide for the safety of all persons, including his/her employees.

B. Work Hazard Analysis Report

The Contractor will be required to complete a work hazard analysis report. This report shall outline how the Contractor proposes to satisfy all safety laws and regulations involved in performing the work. This report shall be completed and submitted to the City Safety Officer before the pre-construction conference. A copy of the report shall be maintained at the work site (accessible to the supervisor).

3.06 PROTECTION OF WORKERS AND PROPERTY

The Contractor shall erect and maintain good and sufficient guards, barricades and signals at all unsafe places at or near the work and shall, in all cases, maintain safe passageways at all road crossings, and crosswalks, and shall do all other things necessary to prevent accident or loss of any kind.

The Contractor shall protect from damage all utilities, improvements, and all other property that is likely to become displaced or damaged by the execution of the work under this Contract.

The Contractor is responsible for all roads and property damaged by his/her operations as shall be determined by the Engineer administering this Contract. The Contractor shall be responsible for repairing all damage to roads caused by his/her operations to the satisfaction of the particular governmental body having jurisdiction over the road.

3.07 CONTRACTOR - SUPERVISION AND CHARACTER OF EMPLOYEES

A. Superintendent to Supervise Contractor's Employees

The Contractor shall keep on his/her work, during its progress, a competent superintendent and any necessary assistants, all of whom must be satisfactory to the City of Tacoma. The Contractor's superintendent shall not be changed except with the consent of the City of Tacoma, unless the Contractor's superintendent proves to be unsatisfactory to the Contractor and ceases to be in his/her employ. The Contractor's superintendent shall represent the Contractor in his/her absence and all directions given to him/her shall be binding as if given to the Contractor directly. The Contractor shall give efficient supervision to the work, using his/her best skill and attention.

B. Character of Contractor's Employees

The Contractor shall employ only competent, skillful, faithful and orderly persons to do the work, and whenever the Engineer administering the Contract shall notify the Contractor in writing that any person on the work is, in his or her opinion, incompetent, unfaithful, disorderly or otherwise unsatisfactory, the Contractor shall forthwith discharge such persons from the work and shall not again employ him or her on this Contract.

3.08 CONTRACTOR'S COMPLIANCE WITH THE LAW

A. Hours of Labor

The Contractor and Subcontractors shall be bound by the provisions of RCW Chapter 49.28 (as amended) relating to hours of labor. Except as set forth in the Special Provisions, eight (8) hours in any calendar day shall constitute a day's work on a job performed under this Contract.

In the event that the work is not performed in accordance with this provision and in accordance with the laws of the State of Washington, then this Contract may be terminated by the City of Tacoma for the reason that the same is not performed in accordance with the public policy of the State of Washington as defined in said statutes.

B. Prevailing Wages

If federal, state, local, or any applicable law requires Supplier to pay prevailing wages in connection with a Contract, and Supplier is so notified by the City, then Supplier shall pay applicable prevailing wages.

If applicable, a Schedule of Prevailing Wage Rates and/or the current prevailing wage determination made by the Secretary of Labor for the locality or localities where the Contract will be performed is attached and made of part of the Contract by this reference. If prevailing wages do apply to the Contract, Supplier and its subcontractors shall:

1. Be bound by and perform all transactions regarding the Contract relating to prevailing wages and the usual fringe benefits in compliance with the provisions of Chapter 39.12 RCW, as amended, the Washington State Prevailing Wage Act and/or the Davis-Bacon Act (40 U.S.C. 3141- 3144, and 3146-3148) and the requirements of 29 C.F.R. pt. 5 as may be applicable, including the federal requirement to pay wages not less than once a week,
2. Ensure that no worker, laborer or mechanic employed in the performance of any part of the Contract shall be paid less than the prevailing rate of wage specified on that Schedule and/or specified in a wage determination made by the Secretary of Labor (unless specifically preempted by federal law, the higher of the Washington state prevailing wage or federal Davis-Bacon rate of wage must be paid) and Additionally, in compliance with applicable federal law, contractors are required to pay wages not less than once a week.
3. Immediately upon award of the Contract, contact the Department of Labor and Industries, Prevailing Wages section, Olympia, Washington and/or the federal Department of Labor, to obtain full information, forms and procedures relating to these matters. Per such procedures, a Statement of Intent to Pay Prevailing Wages and/or other or additional documentation required by applicable federal law, must be submitted by Contractor and its subcontractors to the City, in the manner requested by the City, prior to any payment by the City hereunder, and an Affidavit of Wages Paid and/or other or additional documentation required by federal law must be received or verified by the City prior to final Contract payment. In the event any dispute arises as to what are the prevailing rates of wages for work of a similar nature and such dispute cannot be adjusted by the parties in interest, including labor and management representatives, the matter shall be referred for arbitration to the Director of the State of Washington, Department of Labor and industries whose decision shall be final, conclusive and binding on all parties involved in the dispute.

3.09 COPELAND ANTI-KICKBACK ACT

For contracts subject to Davis Bacon Act the following clauses will be incorporated into the Contract:

A. Contractor. The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract.

B. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

C. Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

3.10 CHANGES

A. In Plans or Quantities

The City of Tacoma, without invalidating this Contract, or any part of this Contract, may order extra work or make reasonable changes by altering, adding to or deducting from the materials, work and labor and the Contract sum will be adjusted accordingly. All such work and labor shall be executed under the conditions of the original Contract except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change. When work or bid items are deducted, reduced or eliminated, it is agreed that no payment will be made to Contractor for anticipated profit.

B. Extra Work

Any claim or order for extra materials, work and labor made necessary by alterations or additions to the plans or by other reasons for which no price is provided in this Contract, shall not be valid unless the Contractor and Engineer administering the Contract have agreed upon a price prior to commencing extra work, and the agreement has been signed by the Contractor and approved by the Superintendent or his/her designee, and approved by the payment and performance bond surety.

C. Extra Work - No Agreed Price

If it is impracticable to fix an increase in price definitely in advance, the order may fix a maximum price which shall not under any circumstances, be exceeded, and subject to such limitation, such alteration, modification, or extra shall be paid for at the actual necessary cost as determined by the City of Tacoma, which cost (including an allowance for profit) shall be determined as the sum of the following items (1) to (7) inclusive:

- (1) Labor, computed at regular wage scale, including premium on compensation insurance and charge for social security taxes, and other taxes, pertaining to labor; no charge for premium pay shall be allowed unless authorized by the Engineer administering the Contract;
- (2) The proportionate cost of premiums on comprehensive general liability and other insurance applicable to the extra work involved and required under this Contract;
- (3) Material, including sales taxes pertaining to materials;
- (4) Plant and equipment rental, to be agreed upon in writing before the work is begun; no charge for the cost of repairs to plant or equipment will be allowed;
- (5) Superintendence, general expense and profit computed at 20 percent of the total of paragraphs (1) to (4) inclusive;
- (6) The proportionate cost of premiums on bonds required by this Contract, computed by 1 1/2 percent of the total of paragraphs (1) to (5) inclusive.
- (7) The City of Tacoma reserves the right to furnish such materials as it may deem expedient, and no allowance will be made for profit thereon.

Whenever any extra work is in progress, for which the definite price has not been agreed on in advance, the Contractor shall each day, report to the Engineer the amount and cost of the labor and material used, and any other expense incurred in such extra work on the preceding day, and no claim for compensation for such extra work will be allowed unless such report shall have been made.

The above-described methods of determining the payment for work and materials shall not apply to the performance of any work or the furnishing of any material, which, in the judgment of the Engineer administering the Contract, may properly be classified under items for which prices are established in the Contract.

D. Claims for Extra Work

If the Contractor claims that any instructions by drawings or otherwise, involve extra cost under this Contract, he/she shall give the City of Tacoma written notice thereof within 30 days after receipt of such instruction, and in any event before proceeding to execute the work, except in an emergency endangering life or property, and the procedures governing the same shall be as provided for immediately above in this paragraph. The method in these paragraphs is the only method available to the Contractor for payment of claims for extra work performed under the terms of this Contract.

3.11 CLEANING UP

The Contractor shall at all times, at his/her own expense, keep the premises free from accumulation of waste materials or debris caused by any workers or the work, at the completion of the work the Contractor shall remove all his waste materials from and about the site and all his/her equipment, sanitary facilities and surplus materials. In the case of dispute, the City of Tacoma may remove the debris and charge the cost to the Contractor as the City of Tacoma shall determine to be just. All material that is deposited or placed elsewhere than in places designated or approved by the Engineer administering the Contract will not be paid for and the Contractor may be required to remove such material and deposit or place it where directed.

3.12 PROGRESS PAYMENT

Progress payments will be made up to the amount of ninety-five percent (95%) of the actual work completed as shall be determined by the Engineer administering the Contract.

The Contractor may request that an escrow account be established as permitted by law, in which event the Contractor will earn interest on the retained funds.

When the time for construction, services and/or installation will exceed thirty (30) days, the Contractor may request, by invoice, to be paid a progress payment based on percentage of work completed. The Engineer will review and approve the progress payment request on a monthly basis.

3.13 FINAL PAYMENT

The final payment of five percent (5%) of the Contract price shall be approved on final acceptance of the work under this Contract by the Superintendent or his/her designee. In addition, before final payment is made, the Contractor shall be required to:

- A. Provide a certificate from the Washington State Department of Revenue that all taxes due from the Contractor have been paid or are collectible in accordance with the provisions of Chapter 60.28 and Title 82 of the Revised Code of Washington;
- B. Provide the General Release to the City of Tacoma on the form set forth in these Contract documents;
- C. Provide a release of any outstanding liens that have been otherwise filed against any monies held or retained by the City of Tacoma;
- D. File with the City Director of Finance, and with the Director of the Washington State Department of Labor and Industries, on the state form to be provided, an affidavit of wages paid;
- E. File with the City Director of Finance, on the state form to be provided, a statement from the State of Washington, Department of Labor and Industries, certifying that the prevailing wage requirements have been satisfied.
- F. File with the City Director of Finance, on the state form to be provided, a statement of release from the Public Works Contracts Division of the State of Washington, Department of Labor and Industries, verifying that all industrial insurance and medical aid premiums have been paid.

If there is a fee assessed to the City for any certificate, release or other form required by law, the contractor agrees that the fee amount may be passed on to the Contractor and deducted from the monies paid to the Contractor.

3.14 FAILURE TO COMPLETE THE WORK ON TIME

Should the completion of the work required under the Contract be delayed beyond the expiration of the period herein set for the completion of said work, or such extension of said period as may be allowed by reason of unavoidable delays, there shall be deducted from the total Contract price of work, for each calendar day by which such completion shall be delayed beyond said period of such extension thereof the sum of \$300 or a sum of money as set forth hereinafter in these Specifications, as the amount of such deduction per calendar day.

Said sum shall be considered not as a penalty, but as liquidated damages, which the City will suffer by reason of the failure of the Contractor to perform and complete the work within the period, herein fixed or such extensions of said period as may be allowed by reason of unavoidable delays.

Any money due or to become due the Contractor may be retained by the City to cover said liquidated damages, and should such money not be sufficient to cover such damages, the City shall have the right to recover the balance from the Contractor or his/her Sureties.

The filing of any bid for the work herein contemplated shall constitute acknowledgment by the Respondent that he/she understands, agrees and has ascertained that the City will actually suffer damages to the amount hereinabove fixed for each and every calendar day during which the completion of the work herein required shall be delayed beyond the expiration of the period herein fixed for such completion or such extension of said period as may be allowed by reason of unavoidable delays.

3.15 CITY RESERVES RIGHT TO USE FACILITIES PRIOR TO ACCEPTANCE

The City of Tacoma hereby reserves the right to use the facilities herein contracted prior to final acceptance under this Contract. The use of said facilities, as mentioned herein, shall not be construed as a waiver or relinquishment of any rights that the City of Tacoma has under this Contract.

3.16 LIST OF SUBCONTRACTORS

Bid proposals for construction, alteration or repair of any building or other public works that may exceed \$1,000,000 including tax shall satisfy the following requirement: Respondent shall submit as part of the bid, the names of the subcontractors, with whom the respondent, if awarded the contract, will subcontract 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 to name itself for the work. The respondent shall not list more than one subcontractor for each category of work identified, unless subcontractors vary with bid alternates, in which case the respondent must indicate which subcontractor will be used for which alternate. Failure to comply with this provision or the naming of two or more subcontractors to perform the same work shall require the City (pursuant to state law RCW 39.30.060) to determine that respondent's bid is nonresponsive; therefore, the bid will be rejected.

P A R T I I I

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PART 1 – GENERAL PROVISIONS

1.01 DEFINITIONS

- A. “Application for Payment” means a written request submitted by Contractor to A/E for payment of Work completed in accordance with the Contract Documents and approved Schedule of Values, supported by such substantiating data as Owner or A/E may require.
- B. “Architect,” “Engineer,” or “A/E” means a person or entity lawfully entitled to practice architecture or engineering, representing Owner within the limits of its delegated authority.
- C. “Change Order” means a written instrument signed by Owner and Contractor stating their agreement upon all of the following: (1) a change in the Work; (2) the amount of the adjustment in the Contract Sum, if any, and (3) the extent of the adjustment in the Contract Time, if any.
- D. “Claim” means Contractor’s exclusive remedy for resolving disputes with Owner regarding the terms of a Change Order or a request for equitable adjustment, as more fully set forth in Part 8.
- E. “Contract Award Amount” is the sum of the Base Bid and any accepted Alternates.
- F. “Contract Documents” means the Advertisement for Bids, Instructions for Bidders, completed Bid Form, General Conditions, Modifications to the General Conditions, Supplemental Conditions, Public Works Contract, other Special Forms, Drawings and Specifications, and all addenda and modifications thereof.
- G. “Contract Sum” is the total amount payable by Owner to Contractor, for performance of the Work in accordance with the Contract Documents, including all taxes imposed by law and properly chargeable to the Work, except Washington State sales tax.
- H. “Contract Time” is the number of calendar days allotted in the Contract Documents for achieving Substantial Completion of the Work.
- I. “Contractor” means the person or entity who has agreed with Owner to perform the Work in accordance with the Contract Documents.
- J. “Day(s)”: Unless otherwise specified, day(s) shall mean calendar day(s).”
- K. “Drawings” are the graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, and may include plans, elevations, sections, details, schedules, and diagrams.
- L. “Final Acceptance” means the written acceptance issued to Contractor by Owner after Contractor has completed the requirements of the Contract Documents, as more fully set forth in Section 6.09 B.
- M. “Final Completion” means that the Work is fully and finally complete in accordance with the Contract Documents, as more fully set forth in Section 6.09 A.
- N. “Force Majeure” means those acts entitling Contractor to request an equitable adjustment in the Contract Time, as more fully set forth in paragraph 3.05A.
- O. “Notice” means a written notice which has been delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended or, if delivered or sent by registered or certified mail, to the last business address known to the party giving notice.

- P. "Notice to Proceed" means a notice from Owner to Contractor that defines the date on which the Contract Time begins to run.
- Q. "Owner" means the state agency, institution, or its authorized representative with the authority to enter into, administer, and/or terminate the Work in accordance with the Contract Documents and make related determinations and findings.
- R. "Person" means a corporation, partnership, business association of any kind, trust, company, or individual.
- S. "Prior Occupancy" means Owner's use of all or parts of the Project before Substantial Completion, as more fully set forth in Section 6.08 A.
- T. "Progress Schedule" means a schedule of the Work, in a form satisfactory to Owner, as further set forth in Section 3.02.
- U. "Project" means the total construction of which the Work performed in accordance with the Contract Documents may be the whole or a part and which may include construction by Owner or by separate contractors.
- V. "Project Record" means the separate set of Drawings and Specifications as further set forth in paragraph 4.02A.
- W. "Schedule of Values" means a written breakdown allocating the total Contract Sum to each principal category of Work, in such detail as requested by Owner.
- X. "Specifications" are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.
- Y. "Subcontract" means a contract entered into by Subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind for or in connection with the Work.
- Z. "Subcontractor" means any person, other than Contractor, who agrees to furnish or furnishes any supplies, materials, equipment, or services of any kind in connection with the Work.
- AA. "Substantial Completion" means that stage in the progress of the Work when the construction is sufficiently complete, as more fully set forth in Section 6.07.
- AB. "Work" means the construction and services required by the Contract Documents, and includes, but is not limited to, labor, materials, supplies, equipment, services, permits, and the manufacture and fabrication of components, performed, furnished, or provided in accordance with the Contract Documents.

1.02 ORDER OF PRECEDENCE

Any conflict or inconsistency in the Contract Documents shall be resolved by giving the documents precedence in the following order:

1. Signed Public Works Contract, including any Change Orders.
2. Supplemental Conditions.
3. Modifications to the General Conditions.
4. General Conditions.

5. Specifications. Provisions in Division 1 shall take precedence over provisions of any other Division.
6. Drawings. In case of conflict within the Drawings, large scale drawings shall take precedence over small scale drawings.
7. Signed and Completed Bid Form.
8. Instructions to Bidders.
9. Advertisement for Bids.

1.03 EXECUTION AND INTENT

Contractor Representations: Contractor makes the following representations to Owner:

1. Contract Sum reasonable: The Contract Sum is reasonable compensation for the Work and the Contract Time is adequate for the performance of the Work, as represented by the Contract Documents;
2. Contractor familiar with project: Contractor has carefully reviewed the Contract Documents, visited and examined the Project site, become familiar with the local conditions in which the Work is to be performed, and satisfied itself as to the nature, location, character, quality and quantity of the Work, the labor, materials, equipment, goods, supplies, work, services and other items to be furnished and all other requirements of the Contract Documents, as well as the surface and subsurface conditions and other matters that may be encountered at the Project site or affect performance of the Work or the cost or difficulty thereof;
3. Contractor financially capable: Contractor is financially solvent, able to pay its debts as they mature, and possesses sufficient working capital to complete the Work and perform Contractor's obligations required by the Contract Documents; and
4. Contractor can complete Work: Contractor is able to furnish the plant, tools, materials, supplies, equipment and labor required to complete the Work and perform the obligations required by the Contract Documents and has sufficient experience and competence to do so.

PART 2 – INSURANCE AND BONDS

2.01 CONTRACTOR'S LIABILITY INSURANCE

General insurance requirements: Prior to commencement of the Work, Contractor shall obtain all the insurance required by the Contract Documents and provide evidence satisfactory to Owner that such insurance has been procured. Review of the Contractor's insurance by Owner shall not relieve or decrease the liability of Contractor. Companies writing the insurance to be obtained by this part shall be licensed to do business under Chapter 48 RCW or comply with the Surplus Lines Law of the State of Washington. Contractor shall include in its bid the cost of all insurance and bond costs required to complete the base bid work and accepted alternates. Insurance carriers providing insurance in accordance with the Contract Documents shall be acceptable to Owner, and its A.M. Best rating shall be indicated on the insurance certificates.

- A. Term of insurance coverage: Contractor shall maintain the following insurance coverage during the Work and for one year after Final Acceptance. Contractor shall also maintain the following insurance coverage during the performance of any corrective Work required by Section 5.16.

1. General Liability Insurance: Commercial General Liability (CGL) on an Occurrence Form. Coverage shall include, but not be limited to:
 - a. Completed operations/products liability;
 - b. Explosion, collapse, and underground; and
 - c. Employer's liability coverage.
 2. Automobile Liability Insurance: Automobile liability
- B. Industrial Insurance compliance: Contractor shall comply with the Washington State Industrial Insurance Act and, if applicable, the Federal Longshoremen's and Harbor Workers' Act and the Jones Act.
- C. Insurance to protect for the following: All insurance coverages shall protect against claims for damages for personal and bodily injury or death, as well as claims for property damage, which may arise from operations in connection with the Work whether such operations are by Contractor or any Subcontractor.
- D. Owner as Additional Insured: All insurance coverages shall be endorsed to include Owner as an additional named insured for Work performed in accordance with the Contract Documents, and all insurance certificates shall evidence the Owner as an additional insured.

2.02 COVERAGE LIMITS

Insurance amounts: The coverage limits shall be as follows:

- A. Limits of Liability shall not be less than \$1,000,000 Combined Single Limit for Bodily Injury and Property Damage (other than Automobile Liability) Each Occurrence; Personal Injury and Advertising Liability Each Occurrence.
- B. \$2,000,000 Combined Single Limit Annual General Aggregate.
- C. \$2,000,000 Annual Aggregate for Products and Completed Operations Liability.
- D. \$1,000,000 Combined Single Limit for Automobile Bodily Injury and Property Damage Liability, Each Accident or Loss.

2.03 INSURANCE COVERAGE CERTIFICATES

- A. Certificate required: Prior to commencement of the Work, Contractor shall furnish to Owner a completed certificate of insurance coverage.
- B. List Project info: All insurance certificates shall name Owner's Project number and Project title.
- C. Cancellation provisions: All insurance certificates shall specifically require 45 Days prior notice to Owner of cancellation or any material change, except 30 Days for surplus line insurance.

2.04 PAYMENT AND PERFORMANCE BONDS

Conditions for bonds: Payment and performance bonds for 100% of the Contract Award Amount, plus state sales tax, shall be furnished for the Work, using the Payment Bond and Performance Bond form published by and available from the American Institute of Architects (AIA) – form A312. Prior to execution of a Change Order that, cumulatively with previous Change Orders, increases the Contract Award Amount by 15% or more, the Contractor shall provide either new payment and performance bonds for the

revised Contract Sum, or riders to the existing payment and performance bonds increasing the amount of the bonds. The Contractor shall likewise provide additional bonds or riders when subsequent Change Orders increase the Contract Sum by 15% or more. No payment or performance bond is required if the Contract Sum is \$35,000 or less and Contractor agrees that Owner may, in lieu of the bond, retain 50% of the Contract Sum for the period allowed by RCW 39.08.010.

2.05 ALTERNATIVE SURETY

When alternative surety required: Contractor shall promptly furnish payment and performance bonds from an alternative surety as required to protect Owner and persons supplying labor or materials required by the Contract Documents if:

- A. Owner has a reasonable objection to the surety; or
- B. Any surety fails to furnish reports on its financial condition if required by Owner.

2.06 BUILDER'S RISK

- A. Contractor to buy Property Insurance: Contractor shall purchase and maintain property insurance in the amount of the Contract Sum including all Change Orders for the Work on a replacement cost basis until Substantial Completion. For projects not involving New Building Construction, "Installation Floater" is an acceptable substitute for the Builder's Risk Insurance. The insurance shall cover the interest of Owner, Contractor, and any Subcontractors, as their interests may appear.
- B. Losses covered: Contractor property insurance shall be placed on an "all risk" basis and insure against the perils of fire and extended coverage and physical loss or damage including theft, vandalism, malicious mischief, collapse, false work, temporary buildings, debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for A/E's services and expenses required as a result of an insured loss.
- C. Waiver of subrogation rights: Owner and Contractor waive all subrogation rights against each other, any Subcontractors, A/E, A/E's subconsultants, separate contractors described in Section 5.20, if any, and any of their subcontractors, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this section or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by Owner as fiduciary. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

PART 3 – TIME AND SCHEDULE

3.01 PROGRESS AND COMPLETION

Contractor to meet schedule: Contractor shall diligently prosecute the Work, with adequate forces, achieve Substantial Completion within the Contract Time, and achieve Final Completion within a reasonable period thereafter.

3.02 CONSTRUCTION SCHEDULE

- A. Preliminary Progress Schedule: Unless otherwise provided in Division 1, Contractor shall, within 14 Days after issuance of the Notice to Proceed, submit a preliminary Progress Schedule. The Progress Schedule shall show the sequence in which Contractor proposes to perform the Work,

and the dates on which Contractor plans to start and finish major portions of the Work, including dates for shop drawings and other submittals, and for acquiring materials and equipment.

- B. Form of Progress Schedule: Unless otherwise provided in Division 1, the Progress Schedule shall be in the form of a bar chart, or a critical path method analysis, as specified by Owner. The preliminary Progress Schedule may be general, showing the major portions of the Work, with a more detailed Progress Schedule submitted as directed by Owner.
- C. Owner comments on Progress Schedule: Owner shall return comments on the preliminary Progress Schedule to Contractor within 14 Days of receipt. Review by Owner of Contractor's schedule does not constitute an approval or acceptance of Contractor's construction means, methods, or sequencing, or its ability to complete the Work within the Contract Time. Contractor shall revise and resubmit its schedule, as necessary. Owner may withhold a portion of progress payments until a Progress Schedule has been submitted which meets the requirements of this section.
- D. Monthly updates and compliance with Progress Schedule: Contractor shall utilize and comply with the Progress Schedule. On a monthly basis, or as otherwise directed by Owner, Contractor shall submit an updated Progress Schedule at its own expense to Owner indicating actual progress. If, in the opinion of Owner, Contractor is not in conformance with the Progress Schedule for reasons other than acts of Force Majeure as identified in Section 3.05, Contractor shall take such steps as are necessary to bring the actual completion dates of its work activities into conformance with the Progress Schedule, and if directed by Owner, Contractor shall submit a corrective action plan or revise the Progress Schedule to reconcile with the actual progress of the Work.
- E. Contractor to notify Owner of delays: Contractor shall promptly notify Owner in writing of any actual or anticipated event which is delaying or could delay achievement of any milestone or performance of any critical path activity of the Work. Contractor shall indicate the expected duration of the delay, the anticipated effect of the delay on the Progress Schedule, and the action being or to be taken to correct the problem. Provision of such notice does not relieve Contractor of its obligation to complete the Work within the Contract Time.

3.03 OWNER'S RIGHT TO SUSPEND THE WORK FOR CONVENIENCE

- A. Owner may suspend Work: Owner may, at its sole discretion, order Contractor, in writing, to suspend all or any part of the Work for up to 90 Days, or for such longer period as mutually agreed.
- B. Compliance with suspension; Owner's options: Upon receipt of a written notice suspending the Work, Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of cost of performance directly attributable to such suspension. Within a period up to 90 Days after the notice is delivered to Contractor, or within any extension of that period to which the parties shall have agreed, Owner shall either:
 - 1. Cancel the written notice suspending the Work; or
 - 2. Terminate the Work covered by the notice as provided in the termination provisions of Part 9.
- C. Resumption of Work: If a written notice suspending the Work is cancelled or the period of the notice or any extension thereof expires, Contractor shall resume Work.
- D. Equitable Adjustment for suspensions: Contractor shall be entitled to an equitable adjustment in the Contract Time, or Contract Sum, or both, for increases in the time or cost of performance

directly attributable to such suspension, provided Contractor complies with all requirements set forth in Part 7.

3.04 OWNER'S RIGHT TO STOP THE WORK FOR CAUSE

- A. Owner may stop Work for Contractor's failure to perform: If Contractor fails or refuses to perform its obligations in accordance with the Contract Documents, Owner may order Contractor, in writing, to stop the Work, or any portion thereof, until satisfactory corrective action has been taken.
- B. No Equitable Adjustment for Contractor's failure to perform: Contractor shall not be entitled to an equitable adjustment in the Contract Time or Contract Sum for any increased cost or time of performance attributable to Contractor's failure or refusal to perform or from any reasonable remedial action taken by Owner based upon such failure.

3.05 DELAY

- A. Force Majeure actions not a default; Force Majeure defined: Any delay in or failure of performance by Owner or Contractor, other than the payment of money, shall not constitute a default hereunder if and to the extent the cause for such delay or failure of performance was unforeseeable and beyond the control of the party ("Force Majeure"). Acts of Force Majeure include, but are not limited to:
1. Acts of God or the public enemy;
 2. Acts or omissions of any government entity;
 3. Fire or other casualty for which Contractor is not responsible;
 4. Quarantine or epidemic;
 5. Strike or defensive lockout;
 6. Unusually severe weather conditions which could not have been reasonably anticipated; and
 7. Unusual delay in receipt of supplies or products which were ordered and expedited and for which no substitute reasonably acceptable to Owner was available.
- B. Contract Time adjustment for Force Majeure: Contractor shall be entitled to an equitable adjustment in the Contract Time for changes in the time of performance directly attributable to an act of Force Majeure, provided it makes a request for equitable adjustment according to Section 7.03. Contractor shall not be entitled to an adjustment in the Contract Sum resulting from an act of Force Majeure.
- C. Contract Time or Contract Sum adjustment if Owner at fault: Contractor shall be entitled to an equitable adjustment in Contract Time, and may be entitled to an equitable adjustment in Contract Sum, if the cost or time of Contractor's performance is changed due to the fault or negligence of Owner, provided the Contractor makes a request according to Sections 7.02 and 7.03.
- D. No Contract Time or Contract Sum adjustment if Contractor at fault: Contractor shall not be entitled to an adjustment in Contract Time or in the Contract Sum for any delay or failure of performance to the extent such delay or failure was caused by Contractor or anyone for whose acts Contractor is responsible.

- E. Contract Time adjustment only for concurrent fault: To the extent any delay or failure of performance was concurrently caused by the Owner and Contractor, Contractor shall be entitled to an adjustment in the Contract Time for that portion of the delay or failure of performance that was concurrently caused, provided it makes a request for equitable adjustment according to Section 7.03, but shall not be entitled to an adjustment in Contract Sum.
- F. Contractor to mitigate delay impacts: Contractor shall make all reasonable efforts to prevent and mitigate the effects of any delay, whether occasioned by an act of Force Majeure or otherwise.

3.06 NOTICE TO OWNER OF LABOR DISPUTES

- A. Contractor to notify Owner of labor disputes: If Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay timely performance in accordance with the Contract Documents, Contractor shall immediately give notice, including all relevant information, to Owner.
- B. Pass through notification provisions to Subcontractors: Contractor agrees to insert a provision in its Subcontracts and to require insertion in all sub-subcontracts, that in the event timely performance of any such contract is delayed or threatened by delay by any actual or potential labor dispute, the Subcontractor or Sub-subcontractor shall immediately notify the next higher tier Subcontractor or Contractor, as the case may be, of all relevant information concerning the dispute.

3.07 DAMAGES FOR FAILURE TO ACHIEVE TIMELY COMPLETION

A. Liquidated Damages

- 1. Reason for Liquidated Damages: Timely performance and completion of the Work is essential to Owner and time limits stated in the Contract Documents are of the essence. Owner will incur serious and substantial damages if Substantial Completion of the Work does not occur within the Contract Time. However, it would be difficult if not impossible to determine the exact amount of such damages. Consequently, provisions for liquidated damages are included in the Contract Documents.
- 2. Calculation of Liquidated Damages amount: The liquidated damage amounts set forth in the Contract Documents will be assessed not as a penalty, but as liquidated damages for breach of the Contract Documents. This amount is fixed and agreed upon by and between the Contractor and Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain. This amount shall be construed as the actual amount of damages sustained by the Owner, and may be retained by the Owner and deducted from periodic payments to the Contractor.
- 3. Contractor responsible even if Liquidated Damages assessed: Assessment of liquidated damages shall not release Contractor from any further obligations or liabilities pursuant to the Contract Documents.

B. Actual Damages

Calculation of Actual Damages: Actual damages will be assessed for failure to achieve Final Completion within the time provided. Actual damages will be calculated on the basis of direct architectural, administrative, and other related costs attributable to the Project from the date when Final Completion should have been achieved, based on the date Substantial Completion is actually achieved, to the date Final Completion is actually achieved. Owner may offset these costs against any payment due Contractor.

PART 4 – SPECIFICATIONS, DRAWINGS, AND OTHER DOCUMENTS

4.01 DISCREPANCIES AND CONTRACT DOCUMENT REVIEW

- A. Specifications and Drawings are basis of the Work: The intent of the Specifications and Drawings is to describe a complete Project to be constructed in accordance with the Contract Documents. Contractor shall furnish all labor, materials, equipment, tools, transportation, permits, and supplies, and perform the Work required in accordance with the Drawings, Specifications, and other provisions of the Contract Documents.
- B. Parts of the Contract Documents are complementary: The Contract Documents are complementary. What is required by one part of the Contract Documents shall be binding as if required by all. Anything mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both.
- C. Contractor to report discrepancies in Contract Documents: Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by Owner. If, during the performance of the Work, Contractor finds a conflict, error, inconsistency, or omission in the Contract Documents, it shall promptly and before proceeding with the Work affected thereby, report such conflict, error, inconsistency, or omission to A/E in writing.
- D. Contractor knowledge of discrepancy in documents – responsibility: Contractor shall do no Work without applicable Drawings, Specifications, or written modifications, or Shop Drawings where required, unless instructed to do so in writing by Owner. If Contractor performs any construction activity, and it knows or reasonably should have known that any of the Contract Documents contain a conflict, error, inconsistency, or omission, Contractor shall be responsible for the performance and shall bear the cost for its correction.
- E. Contractor to perform Work implied by Contract Documents: Contractor shall provide any work or materials the provision of which is clearly implied and is within the scope of the Contract Documents even if the Contract Documents do not mention them specifically.
- F. Interpretation questions referred to A/E: Questions regarding interpretation of the requirements of the Contract Documents shall be referred to the A/E.

4.02 PROJECT RECORD

- A. Contractor to maintain Project Record Drawings and Specifications: Contractor shall legibly mark in ink on a separate set of the Drawings and Specifications all actual construction, including depths of foundations, horizontal and vertical locations of internal and underground utilities and appurtenances referenced to permanent visible and accessible surface improvements, field changes of dimensions and details, actual suppliers, manufacturers and trade names, models of installed equipment, and Change Order Proposals (COP). This separate set of Drawings and Specifications shall be the "Project Record."
- B. Update Project Record weekly and keep on site: The Project Record shall be maintained on the project site throughout the construction and shall be clearly labeled "PROJECT RECORD." The Project Record shall be updated at least weekly noting all changes and shall be available to Owner at all times.
- C. Final Project Record to A/E before Final Acceptance: Contractor shall submit the completed and finalized Project Record to A/E prior to Final Acceptance.

4.03 SHOP DRAWINGS

- A. Definition of Shop Drawings: “Shop Drawings” means documents and other information required to be submitted to A/E by Contractor pursuant to the Contract Documents, showing in detail: the proposed fabrication and assembly of structural elements; and the installation (i.e. form, fit, and attachment details) of materials and equipment. Shop Drawings include, but are not limited to, drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, samples, and similar materials furnished by Contractor to explain in detail specific portions of the Work required by the Contract Documents. For materials and equipment to be incorporated into the Work, Contractor submittal shall include the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the item. When directed, Contractor shall submit all samples at its own expense. Owner may duplicate, use, and disclose Shop Drawings provided in accordance with the Contract Documents.
- B. Approval of Shop Drawings by Contractor and A/E: Contractor shall coordinate all Shop Drawings, and review them for accuracy, completeness, and compliance with the Contract Documents and shall indicate its approval thereon as evidence of such coordination and review. Where required by law, Shop Drawings shall be stamped by an appropriate professional licensed by the state of Washington. Shop Drawings submitted to A/E without evidence of Contractor's approval shall be returned for resubmission. Contractor shall review, approve, and submit Shop Drawings with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of Owner or separate contractors. Contractor's submittal schedule shall allow a reasonable time for A/E review. A/E will review, approve, or take other appropriate action on the Shop Drawings. Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings until the respective submittal has been reviewed and the A/E has approved or taken other appropriate action. Owner and A/E shall respond to Shop Drawing submittals with reasonable promptness. Any Work by Contractor shall be in accordance with reviewed Shop Drawings. Submittals made by Contractor which are not required by the Contract Documents may be returned without action.
- C. Contractor not relieved of responsibility when Shop Drawings approved: Approval, or other appropriate action with regard to Shop Drawings, by Owner or A/E shall not relieve Contractor of responsibility for any errors or omissions in such Shop Drawings, nor from responsibility for compliance with the requirements of the Contract Documents. Unless specified in the Contract Documents, review by Owner or A/E shall not constitute an approval of the safety precautions employed by Contractor during construction, or constitute an approval of Contractor's means or methods of construction. If Contractor fails to obtain approval before installation and the item or work is subsequently rejected, Contractor shall be responsible for all costs of correction.
- D. Variations between Shop Drawings and Contract Documents: If Shop Drawings show variations from the requirements of the Contract Documents, Contractor shall describe such variations in writing, separate from the Shop Drawings, at the time it submits the Shop Drawings containing such variations. If A/E approves any such variation, an appropriate Change Order will be issued. If the variation is minor and does not involve an adjustment in the Contract Sum or Contract Time, a Change Order need not be issued; however, the modification shall be recorded upon the Project Record.
- E. Contractor to submit 5 copies of Shop Drawings: Unless otherwise provided in Division 1, Contractor shall submit to A/E for approval 5 copies of all Shop Drawings. Unless otherwise indicated, 3 sets of all Shop Drawings shall be retained by A/E and 2 sets shall be returned to Contractor.

4.04 ORGANIZATION OF SPECIFICATIONS

Specification organization by trade: Specifications are prepared in sections which conform generally with trade practices. These sections are for Owner and Contractor convenience and shall not control Contractor in dividing the Work among the Subcontractors or in establishing the extent of the Work to be performed by any trade.

4.05 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS, AND OTHER DOCUMENTS

- A. A/E, not Contractor, owns Copyright of Drawings and Specifications: The Drawings, Specifications, and other documents prepared by A/E are instruments of A/E's service through which the Work to be executed by Contractor is described. Neither Contractor nor any Subcontractor shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by A/E, and A/E shall be deemed the author of them and will, along with any rights of Owner, retain all common law, statutory, and other reserved rights, in addition to the copyright. All copies of these documents, except Contractor's set, shall be returned or suitably accounted for to A/E, on request, upon completion of the Work.
- B. Drawings and Specifications to be used only for this Project: The Drawings, Specifications, and other documents prepared by the A/E, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor on other projects or for additions to this Project outside the scope of the Work without the specific written consent of Owner and A/E. Contractor and Subcontractors are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications, and other documents prepared by A/E appropriate to and for use in the execution of their Work.
- C. Shop Drawing license granted to Owner: Contractor and all Subcontractors grant a non-exclusive license to Owner, without additional cost or royalty, to use for its own purposes (including reproduction) all Shop Drawings, together with the information and diagrams contained therein, prepared by Contractor or any Subcontractor. In providing Shop Drawings, Contractor and all Subcontractors warrant that they have authority to grant to Owner a license to use the Shop Drawings, and that such license is not in violation of any copyright or other intellectual property right. Contractor agrees to defend and indemnify Owner pursuant to the indemnity provisions in Section 5.03 and 5.22 from any violations of copyright or other intellectual property rights arising out of Owner's use of the Shop Drawings hereunder, or to secure for Owner, at Contractor's own cost, licenses in conformity with this section.
- D. Shop Drawings to be used only for this Project: The Shop Drawings and other submittals prepared by Contractor, Subcontractors of any tier, or its or their equipment or material suppliers, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor of any tier, or material or equipment supplier, on other projects or for additions to this Project outside the scope of the Work without the specific written consent of Owner. The Contractor, Subcontractors of any tier, and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Shop Drawings and other submittals appropriate to and for use in the execution of their Work under the Contract Documents.

PART 5 – PERFORMANCE

5.01 CONTRACTOR CONTROL AND SUPERVISION

- A. Contractor responsible for Means and Methods of construction: Contractor shall supervise and direct the Work, using its best skill and attention, and shall perform the Work in a skillful manner. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work, unless the

Contract Documents give other specific instructions concerning these matters. Contractor shall disclose its means and methods of construction when requested by Owner.

- B. Competent Superintendent required: Performance of the Work shall be directly supervised by a competent superintendent who has authority to act for Contractor. The superintendent must be satisfactory to the Owner and shall not be changed without the prior written consent of Owner. Owner may require Contractor to remove the superintendent from the Work or Project site, if Owner reasonably deems the superintendent incompetent, careless, or otherwise objectionable, provided Owner has first notified Contractor in writing and allowed a reasonable period for transition.
- C. Contractor responsible for acts and omissions of self and agents: Contractor shall be responsible to Owner for acts and omissions of Contractor, Subcontractors, and their employees and agents.
- D. Contractor to employ competent and disciplined workforce: Contractor shall enforce strict discipline and good order among all of the Contractor's employees and other persons performing the Work. Contractor shall not permit employment of persons not skilled in tasks assigned to them. Contractor's employees shall at all times conduct business in a manner which assures fair, equal, and nondiscriminatory treatment of all persons. Owner may, by written notice, request Contractor to remove from the Work or Project site any employee Owner reasonably deems incompetent, careless, or otherwise objectionable.
- E. Contractor to keep project documents on site: Contractor shall keep on the Project site a copy of the Drawings, Specifications, addenda, reviewed Shop Drawings, and permits and permit drawings.
- F. Contractor to comply with ethical standards: Contractor shall ensure that its owner(s) and employees, and those of its Subcontractors, comply with the Ethics in Public Service Act RCW 42.52, which, among other things, prohibits state employees from having an economic interest in any public works contract that was made by, or supervised by, that employee. Contractor shall remove, at its sole cost and expense, any of its, or its Subcontractors' employees, if they are in violation of this act.

5.02 PERMITS, FEES, AND NOTICES

- A. Contractor to obtain and pay for permits: Unless otherwise provided in the Contract Documents, Contractor shall pay for and obtain all permits, licenses, and inspections necessary for proper execution and completion of the Work. Prior to Final Acceptance, the approved, signed permits shall be delivered to Owner.
- B. Allowances for permit fees: If allowances for permits or utility fees are called for in the Contract Documents and set forth in Contractor's bid, and the actual costs of those permits or fees differ from the allowances in the Contract Documents, the difference shall be adjusted by Change Order.
- C. Contractor to comply with all applicable laws: Contractor shall comply with and give notices required by all federal, state, and local laws, ordinances, rules, regulations, and lawful orders of public authorities applicable to performance of the Work.

5.03 PATENTS AND ROYALTIES

Payment, indemnification, and notice: Contractor is responsible for, and shall pay, all royalties and license fees. Contractor shall defend, indemnify, and hold Owner harmless from any costs, expenses, and liabilities arising out of the infringement by Contractor of any patent, copyright, or other intellectual property right used in the Work; however, provided that Contractor gives prompt notice, Contractor shall not be responsible for such defense or indemnity when a particular design, process, or product of a

particular manufacturer or manufacturers is required by the Contract Documents. If Contractor has reason to believe that use of the required design, process, or product constitutes an infringement of a patent or copyright, it shall promptly notify Owner of such potential infringement.

5.04 PREVAILING WAGES

- A. Contractor to pay Prevailing Wages: Contractor shall pay the prevailing rate of wages to all workers, laborers, or mechanics employed in the performance of any part of the Work in accordance with RCW 39.12 and the rules and regulations of the Department of Labor and Industries. The schedule of prevailing wage rates for the locality or localities of the Work, is determined by the Industrial Statistician of the Department of Labor and Industries. It is the Contractor's responsibility to verify the applicable prevailing wage rate.
- B. Statement of Intent to Pay Prevailing Wages: Before payment is made by the Owner to the Contractor for any work performed by the Contractor and subcontractors whose work is included in the application for payment, the Contractor shall submit, or shall have previously submitted to the Owner for the Project, a Statement of Intent to Pay Prevailing Wages, approved by the Department of Labor and Industries, certifying the rate of hourly wage paid and to be paid each classification of laborers, workers, or mechanics employed upon the Work by Contractor and Subcontractors. Such rates of hourly wage shall not be less than the prevailing wage rate.
- C. Affidavit of Wages Paid: Prior to release of retainage, the Contractor shall submit to the Owner an Affidavit of Wages Paid, approved by the Department of Labor and Industries, for the Contractor and every subcontractor, of any tier, that performed work on the Project.
- D. Disputes: Disputes regarding prevailing wage rates shall be referred for arbitration to the Director of the Department of Labor and Industries. The arbitration decision shall be final and conclusive and binding on all parties involved in the dispute as provided for by RCW 39.12.060.
- E. Statement with pay application; Post Statements of Intent at job site: Each Application for Payment submitted by Contractor shall state that prevailing wages have been paid in accordance with the prefilled statement(s) of intent, as approved. Copies of the approved intent statement(s) shall be posted on the job site with the address and telephone number of the Industrial Statistician of the Department of Labor and Industries where a complaint or inquiry concerning prevailing wages may be made.
- F. Contractor to pay for Statements of Intent and Affidavits: In compliance with chapter 296-127 WAC, Contractor shall pay to the Department of Labor and Industries the currently established fee(s) for each statement of intent and/or affidavit of wages paid submitted to the Department of Labor and Industries for certification.
- G. Certified Payrolls: Consistent with WAC 296-127-320, the Contractor and any subcontractor shall submit a certified copy of payroll records if requested.

5.05 HOURS OF LABOR

- A. Overtime: Contractor shall comply with all applicable provisions of RCW 49.28 and they are incorporated herein by reference. Pursuant to that statute, no laborer, worker, or mechanic employed by Contractor, any Subcontractor, or any other person performing or contracting to do the whole or any part of the Work, shall be permitted or required to work more than eight hours in any one calendar day, provided, that in cases of extraordinary emergency, such as danger to life or property, the hours of work may be extended, but in such cases the rate of pay for time employed in excess of eight hours of each calendar day shall be not less than one and one-half times the rate allowed for this same amount of time during eight hours of service.

- B. 4-10 Agreements: Notwithstanding the preceding paragraph, RCW 49.28 permits a contractor or subcontractor in any public works contract subject to those provisions, to enter into an agreement with its employees in which the employees work up to ten hours in a calendar day. No such agreement may provide that the employees work ten-hour days for more than four calendar days a week. Any such agreement is subject to approval by the employees. The overtime provisions of RCW 49.28 shall not apply to the hours, up to forty hours per week, worked pursuant to any such agreement.

5.06 **NONDISCRIMINATION**

- A. Discrimination prohibited by applicable laws: Discrimination in all phases of employment is prohibited by, among other laws and regulations, Title VII of the Civil Rights Act of 1964, the Vietnam Era Veterans Readjustment Act of 1974, Sections 503 and 504 of the Vocational Rehabilitation Act of 1973, the Equal Employment Act of 1972, the Age Discrimination Act of 1967, the Americans with Disabilities Act of 1990, the Civil Rights Act of 1991, Presidential Executive Order 11246, Executive Order 11375, the Washington State Law Against Discrimination, RCW 49.60, and Gubernatorial Executive Order 85-09. These laws and regulations establish minimum requirements for affirmative action and fair employment practices which Contractor must meet.
- B. During performance of the Work:
1. Protected Classes: Contractor shall not discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, age, marital status, or the presence of any physical, sensory, or mental disability, Vietnam era veteran status, or disabled veteran status, nor commit any other unfair practices as defined in RCW 49.60.
 2. Advertisements to state nondiscrimination: Contractor shall, in all solicitations or advertisements for employees placed by or for it, state that all qualified applicants will be considered for employment, without regard to race, creed, color, national origin, sex, age, marital status, or the presence of any physical, sensory, or mental disability.
 3. Contractor to notify unions and others of nondiscrimination: Contractor shall send to each labor union, employment agency, or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising the labor union, employment agency, or workers' representative of Contractor's obligations according to the Contract Documents and RCW 49.60.
 4. Owner and State access to Contractor records: Contractor shall permit access to its books, records, and accounts, and to its premises by Owner, and by the Washington State Human Rights Commission, for the purpose of investigation to ascertain compliance with this section of the Contract Documents.
 5. Pass through provisions to Subcontractors: Contractor shall include the provisions of this section in every Subcontract.

5.07 **SAFETY PRECAUTIONS**

- A. Contractor responsible for safety: Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Work.
- B. Contractor safety responsibilities: In carrying out its responsibilities according to the Contract Documents, Contractor shall protect the lives and health of employees performing the Work and other persons who may be affected by the Work; prevent damage to materials, supplies, and equipment whether on site or stored off-site; and prevent damage to other property at the site or adjacent thereto. Contractor shall comply with all applicable laws, ordinances, rules, regulations,

and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss; shall erect and maintain all necessary safeguards for such safety and protection; and shall notify owners of adjacent property and utilities when prosecution of the Work may affect them.

- C. Contractor to maintain safety records: Contractor shall maintain an accurate record of exposure data on all incidents relating to the Work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. Contractor shall immediately report any such incident to Owner. Owner shall, at all times, have a right of access to all records of exposure.
- D. Contractor to provide HazMat training: Contractor shall provide all persons working on the Project site with information and training on hazardous chemicals in their work at the time of their initial assignment, and whenever a new hazard is introduced into their work area.
1. Information. At a minimum, Contractor shall inform persons working on the Project site of:
 - a. WAC: The requirements of chapter 296-62 WAC, General Occupational Health Standards;
 - b. Presence of hazardous chemicals: Any operations in their work area where hazardous chemicals are present; and
 - c. Hazard communications program: The location and availability of written hazard communication programs, including the required list(s) of hazardous chemicals and material safety data sheets required by chapter 296-62 WAC.
 2. Training. At a minimum, Contractor shall provide training for persons working on the Project site which includes:
 - a. Detecting hazardous chemicals: Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
 - b. Hazards of chemicals: The physical and health hazards of the chemicals in the work area;
 - c. Protection from hazards: The measures such persons can take to protect themselves from these hazards, including specific procedures Contractor, or its Subcontractors, or others have implemented to protect those on the Project site from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and
 - d. Hazard communications program: The details of the hazard communications program developed by Contractor, or its Subcontractors, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.
- E. Hazardous, toxic or harmful substances: Contractor's responsibility for hazardous, toxic, or harmful substances shall include the following duties:
1. Illegal use of dangerous substances: Contractor shall not keep, use, dispose, transport, generate, or sell on or about the Project site, any substances now or hereafter designated as, or which are subject to regulation as, hazardous, toxic, dangerous, or

harmful by any federal, state or local law, regulation, statute or ordinance (hereinafter collectively referred to as "hazardous substances"), in violation of any such law, regulation, statute, or ordinance, but in no case shall any such hazardous substance be stored more than 90 Days on the Project site.

2. Contractor notifications of spills, failures, inspections, and fines: Contractor shall promptly notify Owner of all spills or releases of any hazardous substances which are otherwise required to be reported to any regulatory agency and pay the cost of cleanup. Contractor shall promptly notify Owner of all failures to comply with any federal, state, or local law, regulation, or ordinance; all inspections of the Project site by any regulatory entity concerning the same; all regulatory orders or fines; and all responses or interim cleanup actions taken by or proposed to be taken by any government entity or private party on the Project site.
- F. Public safety and traffic: All Work shall be performed with due regard for the safety of the public. Contractor shall perform the Work so as to cause a minimum of interruption of vehicular traffic or inconvenience to pedestrians. All arrangements to care for such traffic shall be Contractor's responsibilities. All expenses involved in the maintenance of traffic by way of detours shall be borne by Contractor.
- G. Contractor to act in an emergency: In an emergency affecting the safety of life or the Work or of adjoining property, Contractor is permitted to act, at its discretion, to prevent such threatened loss or injury, and Contractor shall so act if so authorized or instructed.
- H. No duty of safety by Owner or A/E: Nothing provided in this section shall be construed as imposing any duty upon Owner or A/E with regard to, or as constituting any express or implied assumption of control or responsibility over, Project site safety, or over any other safety conditions relating to employees or agents of Contractor or any of its Subcontractors, or the public.

5.08 OPERATIONS, MATERIAL HANDLING, AND STORAGE AREAS

- A. Limited storage areas: Contractor shall confine all operations, including storage of materials, to Owner-approved areas.
- B. Temporary buildings and utilities at Contractor expense: Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be provided by Contractor only with the consent of Owner and without expense to Owner. The temporary buildings and utilities shall be removed by Contractor at its expense upon completion of the Work.
- C. Roads and vehicle loads: Contractor shall use only established roadways or temporary roadways authorized by Owner. When materials are transported in prosecuting the Work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by federal, state, or local law or regulation.
- D. Ownership and reporting by Contractor of demolished materials: Ownership and control of all materials or facility components to be demolished or removed from the Project site by Contractor shall immediately vest in Contractor upon severance of the component from the facility or severance of the material from the Project site. Contractor shall be responsible for compliance with all laws governing the storage and ultimate disposal. Contractor shall provide Owner with a copy of all manifests and receipts evidencing proper disposal when required by Owner or applicable law.
- E. Contractor responsible for care of materials and equipment on-site: Contractor shall be responsible for the proper care and protection of its materials and equipment delivered to the Project site. Materials and equipment may be stored on the premises subject to approval of

Owner. When Contractor uses any portion of the Project site as a shop, Contractor shall be responsible for any repairs, patching, or cleaning arising from such use.

- F. Contractor responsible for loss of materials and equipment: Contractor shall protect and be responsible for any damage or loss to the Work, or to the materials or equipment until the date of Substantial Completion, and shall repair or replace without cost to Owner any damage or loss that may occur, except damages or loss caused by the acts or omissions of Owner. Contractor shall also protect and be responsible for any damage or loss to the Work, or to the materials or equipment, after the date of Substantial Completion, and shall repair or replace without cost to Owner any such damage or loss that might occur, to the extent such damages or loss are caused by the acts or omissions of Contractor, or any Subcontractor.

5.09 PRIOR NOTICE OF EXCAVATION

- A. Excavation defined; Use of locator services: "Excavation" means an operation in which earth, rock, or other material on or below the ground is moved or otherwise displaced by any means, except the tilling of soil less than 12 inches in depth for agricultural purposes, or road ditch maintenance that does not change the original road grade or ditch flow line. Before commencing any excavation, Contractor shall provide notice of the scheduled commencement of excavation to all owners of underground facilities or utilities, through locator services.

5.10 UNFORESEEN PHYSICAL CONDITIONS

- A. Notice requirement for concealed or unknown conditions: If Contractor encounters conditions at the site which are subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then Contractor shall give written notice to Owner promptly and in no event later than 7 Days after the first observance of the conditions. Conditions shall not be disturbed prior to such notice.
- B. Adjustment in Contract Time and Contract Sum: If such conditions differ materially and cause a change in Contractor's cost of, or time required for, performance of any part of the Work, the Contractor may be entitled to an equitable adjustment in the Contract Time or Contract Sum, or both, provided it makes a request therefore as provided in Part 7.

5.11 PROTECTION OF EXISTING STRUCTURES, EQUIPMENT, VEGETATION, UTILITIES AND IMPROVEMENTS

- A. Contractor to protect and repair property: Contractor shall protect from damage all existing structures, equipment, improvements, utilities, and vegetation: at or near the Project site; and on adjacent property of a third party, the locations of which are made known to or should be known by Contractor. Contractor shall repair any damage, including that to the property of a third party, resulting from failure to comply with the requirements of the Contract Documents or failure to exercise reasonable care in performing the Work. If Contractor fails or refuses to repair the damage promptly, Owner may have the necessary work performed and charge the cost to Contractor.
- B. Tree and vegetation protection: Contractor shall only remove trees when specifically authorized to do so, and shall protect vegetation that will remain in place.

5.12 LAYOUT OF WORK

- A. Advanced planning of the Work: Contractor shall plan and lay out the Work in advance of operations so as to coordinate all work without delay or revision.

- B. Layout responsibilities: Contractor shall lay out the Work from Owner-established baselines and bench marks indicated on the Drawings, and shall be responsible for all field measurements in connection with the layout. Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the Work. Contractor shall be responsible for executing the Work to the lines and grades that may be established. Contractor shall be responsible for maintaining or restoring all stakes and other marks established.

5.13 MATERIAL AND EQUIPMENT

- A. Contractor to provide new and equivalent equipment and materials: All equipment, material, and articles incorporated into the Work shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in the Contract Documents. References in the Specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard quality and shall not be construed as limiting competition. Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of A/E, is equal to that named in the specifications, unless otherwise specifically provided in the Contract Documents.
- B. Contractor responsible for fitting parts together: Contractor shall do all cutting, fitting, or patching that may be required to make its several parts fit together properly, or receive or be received by work of others set forth in, or reasonably implied by, the Contract Documents. Contractor shall not endanger any work by cutting, excavating, or otherwise altering the Work and shall not cut or alter the work of any other contractor unless approved in advance by Owner.
- C. Owner may reject defective Work: Should any of the Work be found defective, or in any way not in accordance with the Contract Documents, this work, in whatever stage of completion, may be rejected by Owner.

5.14 AVAILABILITY AND USE OF UTILITY SERVICES

- A. Owner to provide and charge for utilities: Owner shall make all reasonable utilities available to Contractor from existing outlets and supplies, as specified in the Contract Documents. Unless otherwise provided in the Contract Documents, the utility service consumed shall be charged to or paid for by Contractor at prevailing rates charged to Owner or, where the utility is produced by Owner, at reasonable rates determined by Owner. Contractor will carefully conserve any utilities furnished.
- B. Contractor to install temporary connections and meters: Contractor shall, at its expense and in a skillful manner satisfactory to Owner, install and maintain all necessary temporary connections and distribution lines, together with appropriate protective devices, and all meters required to measure the amount of each utility used for the purpose of determining charges. Prior to the date of Final Acceptance, Contractor shall remove all temporary connections, distribution lines, meters, and associated equipment and materials.

5.15 TESTS AND INSPECTION

- A. Contractor to provide for all testing and inspection of Work: Contractor shall maintain an adequate testing and inspection program and perform such tests and inspections as are necessary or required to ensure that the Work conforms to the requirements of the Contract Documents. Contractor shall be responsible for inspection and quality surveillance of all its Work and all Work performed by any Subcontractor. Unless otherwise provided, Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. Contractor shall give Owner timely notice of when and

where tests and inspections are to be made. Contractor shall maintain complete inspection records and make them available to Owner.

- B. Owner may conduct tests and inspections: Owner may, at any reasonable time, conduct such inspections and tests as it deems necessary to ensure that the Work is in accordance with the Contract Documents. Owner shall promptly notify Contractor if an inspection or test reveals that the Work is not in accordance with the Contract Documents. Unless the subject items are expressly accepted by Owner, such Owner inspection and tests are for the sole benefit of Owner and do not:
1. Constitute or imply acceptance;
 2. Relieve Contractor of responsibility for providing adequate quality control measures;
 3. Relieve Contractor of responsibility for risk of loss or damage to the Work, materials, or equipment;
 4. Relieve Contractor of its responsibility to comply with the requirements of the Contract Documents; or
 5. Impair Owner's right to reject defective or nonconforming items, or to avail itself of any other remedy to which it may be entitled.
- C. Inspections or inspectors do not modify Contract Documents: Neither observations by an inspector retained by Owner, the presence or absence of such inspector on the site, nor inspections, tests, or approvals by others, shall relieve Contractor from any requirement of the Contract Documents, nor is any such inspector authorized to change any term or condition of the Contract Documents.
- D. Contractor responsibilities on inspections: Contractor shall promptly furnish, without additional charge, all facilities, labor, material and equipment reasonably needed for performing such safe and convenient inspections and tests as may be required by Owner. Owner may charge Contractor any additional cost of inspection or testing when Work is not ready at the time specified by Contractor for inspection or testing, or when prior rejection makes reinspection or retest necessary. Owner shall perform its inspections and tests in a manner that will cause no undue delay in the Work.

5.16 CORRECTION OF NONCONFORMING WORK

- A. Work covered by Contractor without inspection: If a portion of the Work is covered contrary to the requirements in the Contract Documents, it must, if required in writing by Owner, be uncovered for Owner's observation and be replaced at the Contractor's expense and without change in the Contract Time.
- B. Payment provisions for uncovering covered Work: If, at any time prior to Final Completion, Owner desires to examine the Work, or any portion of it, which has been covered, Owner may request to see such Work and it shall be uncovered by Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an adjustment in the Contract Sum for the costs of uncovering and replacement, and, if completion of the Work is thereby delayed, an adjustment in the Contract Time, provided it makes such a request as provided in Part 7. If such Work is not in accordance with the Contract Documents, the Contractor shall pay the costs of examination and reconstruction.
- C. Contractor to correct and pay for non-conforming Work: Contractor shall promptly correct Work found by Owner not to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed, or

completed. Contractor shall bear all costs of correcting such nonconforming Work, including additional testing and inspections.

- D. Contractor's compliance with warranty provisions: If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or within one year after the date for commencement of any system warranties established under Section 6.08, or within the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, Contractor shall correct it promptly after receipt of written notice from Owner to do so. Owner shall give such notice promptly after discovery of the condition. This period of one year shall be extended, with respect to portions of Work first performed after Substantial Completion, by the period of time between Substantial Completion and the actual performance of the Work. Contractor's duty to correct with respect to Work repaired or replaced shall run for one year from the date of repair or replacement. Obligations under this paragraph shall survive Final Acceptance.
- E. Contractor to remove non-conforming Work: Contractor shall remove from the Project site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by Contractor nor accepted by Owner.
- F. Owner may charge Contractor for non-conforming Work: If Contractor fails to correct nonconforming Work within a reasonable time after written notice to do so, Owner may replace, correct, or remove the nonconforming Work and charge the cost thereof to the Contractor.
- G. Contractor to pay for damaged Work during correction: Contractor shall bear the cost of correcting destroyed or damaged Work, whether completed or partially completed, caused by Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.
- H. No Period of limitation on other requirements: Nothing contained in this section shall be construed to establish a period of limitation with respect to other obligations which Contractor might have according to the Contract Documents. Establishment of the time period of one year as described in Section 5.16D relates only to the specific obligation of Contractor to correct the Work, and has no relationship to the time within which the Contractor's obligation to comply with the Contract Documents may be sought to be enforced, including the time within which such proceedings may be commenced.
- I. Owner may accept non-conforming Work and charge Contractor: If Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, Owner may do so instead of requiring its removal and correction, in which case the Contract Sum may be reduced as appropriate and equitable.

5.17 CLEAN UP

Contractor to keep site clean and leave it clean: Contractor shall at all times keep the Project site, including hauling routes, infrastructures, utilities, and storage areas, free from accumulations of waste materials. Before completing the Work, Contractor shall remove from the premises its rubbish, tools, scaffolding, equipment, and materials. Upon completing the Work, Contractor shall leave the Project site in a clean, neat, and orderly condition satisfactory to Owner. If Contractor fails to clean up as provided herein, and after reasonable notice from Owner, Owner may do so and the cost thereof shall be charged to Contractor.

5.18 ACCESS TO WORK

Owner and A/E access to Work site: Contractor shall provide Owner and A/E access to the Work in progress wherever located.

5.19 OTHER CONTRACTS

Owner may award other contracts; Contractor to cooperate: Owner may undertake or award other contracts for additional work at or near the Project site. Contractor shall reasonably cooperate with the other contractors and with Owner's employees and shall carefully adapt scheduling and perform the Work in accordance with these Contract Documents to reasonably accommodate the other work.

5.20 SUBCONTRACTORS AND SUPPLIERS

- A. Subcontractor Responsibility: The Contractor shall include the language of this paragraph in each of its first tier subcontracts, and shall require each of its subcontractors to include the same language of this section in each of their subcontracts, adjusting only as necessary the terms used for the contracting parties. Upon request of the Owner, the Contractor shall promptly provide documentation to the Owner demonstrating that the subcontractor meets the subcontractor responsibility criteria below. The requirements of this paragraph apply to all subcontractors regardless of tier. At the time of subcontract execution, the Contractor shall verify that each of its first tier subcontractors meets the following bidder responsibility criteria:
1. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW, which must have been in effect at the time of subcontract bid submittal;
 2. Have a current Washington Unified Business Identifier (UBI) number;
 3. If applicable, have:
 - a. Industrial Insurance (workers' compensation) coverage for the subcontractor's employees working in Washington, as required in Title 51 RCW;
 - b. A Washington Employment Security Department number, as required in Title 50 RCW;
 - c. A Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
 - d. An electrical contractor license, if required by Chapter 19.28 RCW;
 - e. An elevator contractor license, if required by Chapter 70.87 RCW.
 4. Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065 (3).
 5. On a project subject to the apprenticeship utilization requirements in RCW 39.04.320, not have been found out of compliance by the Washington state apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the date of the Owner's first advertisement of the project.
- B. Provide names of Subcontractors and use qualified firms: Before submitting the first Application for Payment, Contractor shall furnish in writing to Owner the names, addresses, and telephone numbers of all Subcontractors, as well as suppliers providing materials in excess of \$2,500. Contractor shall utilize Subcontractors and suppliers which are experienced and qualified, and meet the requirements of the Contract Documents, if any. Contractor shall not utilize any Subcontractor or supplier to whom the Owner has a reasonable objection, and shall obtain Owner's written consent before making any substitutions or additions.

- C. Subcontracts in writing and pass through provision: All Subcontracts must be in writing. By appropriate written agreement, Contractor shall require each Subcontractor, so far as applicable to the Work to be performed by the Subcontractor, to be bound to Contractor by terms of the Contract Documents, and to assume toward Contractor all the obligations and responsibilities which Contractor assumes toward Owner in accordance with the Contract Documents. Each Subcontract shall preserve and protect the rights of Owner in accordance with the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. However, nothing in this paragraph shall be construed to alter the contractual relations between Contractor and its Subcontractors with respect to insurance or bonds.
- D. Coordination of Subcontractors; Contractor responsible for Work: Contractor shall schedule, supervise, and coordinate the operations of all Subcontractors. No Subcontracting of any of the Work shall relieve Contractor from its responsibility for the performance of the Work in accordance with the Contract Documents or any other obligations of the Contract Documents.
- E. Automatic assignment of subcontracts: Each subcontract agreement for a portion of the Work is hereby assigned by Contractor to Owner provided that:
1. Effective only after termination and Owner approval: The assignment is effective only after termination by Owner for cause pursuant to Section 9.01 and only for those Subcontracts which Owner accepts by notifying the Subcontractor in writing; and
 2. Owner assumes Contractor's responsibilities: After the assignment is effective, Owner will assume all future duties and obligations toward the Subcontractor which Contractor assumed in the Subcontract.
 3. Impact of bond: The assignment is subject to the prior rights of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.

5.21 WARRANTY OF CONSTRUCTION

- A. Contractor warranty of Work: In addition to any special warranties provided elsewhere in the Contract Documents, Contractor warrants that all Work conforms to the requirements of the Contract Documents and is free of any defect in equipment, material, or design furnished, or workmanship performed by Contractor.
- B. Contractor responsibilities: With respect to all warranties, express or implied, for Work performed or materials furnished according to the Contract Documents, Contractor shall:
1. Obtain warranties: Obtain all warranties that would be given in normal commercial practice;
 2. Warranties for benefit of Owner: Require all warranties to be executed, in writing, for the benefit of Owner;
 3. Enforcement of warranties: Enforce all warranties for the benefit of Owner, if directed by Owner; and
 4. Contractor responsibility for subcontractor warranties: Be responsible to enforce any subcontractor's, manufacturer's, or supplier's warranties should they extend beyond the period specified in the Contract Documents.
- C. Warranties beyond Final Acceptance: The obligations under this section shall survive Final Acceptance.

5.22 INDEMNIFICATION

- A. Contractor to indemnify Owner: Contractor shall defend, indemnify, and hold Owner and A/E harmless from and against all claims, demands, losses, damages, or costs, including but not limited to damages arising out of bodily injury or death to persons and damage to property, caused by or resulting from:
1. Sole negligence of Contractor: The sole negligence of Contractor or any of its Subcontractors;
 2. Concurrent negligence: The concurrent negligence of Contractor, or any Subcontractor, but only to the extent of the negligence of Contractor or such Subcontractor; and
 3. Patent infringement: The use of any design, process, or equipment which constitutes an infringement of any United States patent presently issued, or violates any other proprietary interest, including copyright, trademark, and trade secret.
- B. Employee action and RCW Title 51: In any action against Owner and any other entity indemnified in accordance with this section, by any employee of Contractor, its Subcontractors, Sub-subcontractors, agents, or anyone directly or indirectly employed by any of them, the indemnification obligation of this section shall not be limited by a limit on the amount or type of damages, compensation, or benefits payable by or for Contractor or any Subcontractor under RCW Title 51, the Industrial Insurance Act, or any other employee benefit acts. In addition, Contractor waives immunity as to Owner and A/E only, in accordance with RCW Title 51.

PART 6 – PAYMENTS AND COMPLETION

6.01 CONTRACT SUM

Owner shall pay Contract Sum: Owner shall pay Contractor the Contract Sum plus state sales tax for performance of the Work, in accordance with the Contract Documents.

6.02 SCHEDULE OF VALUES

Contractor to submit Schedule of Values: Before submitting its first Application for Payment, Contractor shall submit to Owner for approval a breakdown allocating the total Contract Sum to each principal category of work, in such detail as requested by Owner ("Schedule of Values"). The approved Schedule of Values shall include appropriate amounts for demobilization, record drawings, O&M manuals, and any other requirements for Project closeout, and shall be used by Owner as the basis for progress payments. Payment for Work shall be made only for and in accordance with those items included in the Schedule of Values.

6.03 APPLICATION FOR PAYMENT

- A. Monthly Application for Payment with substantiation: At monthly intervals, unless determined otherwise by Owner, Contractor shall submit to Owner an itemized Application for Payment for Work completed in accordance with the Contract Documents and the approved Schedule of Values. Each application shall be supported by such substantiating data as Owner may require.
- B. Contractor certifies Subcontractors paid: By submitting an Application for Payment, Contractor is certifying that all Subcontractors have been paid, less earned retainage in accordance with RCW 60.28.011, as their interests appeared in the last preceding certificate of payment. By submitting an Application for Payment, Contractor is recertifying that the representations set forth in Section 1.03, are true and correct, to the best of Contractor's knowledge, as of the date of the Application for Payment.

- C. Reconciliation of Work with Progress Schedule: At the time it submits an Application for Payment, Contractor shall analyze and reconcile, to the satisfaction of Owner, the actual progress of the Work with the Progress Schedule.
- D. Payment for material delivered to site or stored off-site: If authorized by Owner, the Application for Payment may include request for payment for material delivered to the Project site and suitably stored, or for completed preparatory work. Payment may similarly be requested for material stored off the Project site, provided Contractor complies with or furnishes satisfactory evidence of the following:
1. Suitable facility or location: The material will be placed in a facility or location that is structurally sound, dry, lighted and suitable for the materials to be stored;
 2. Facility or location within 10 miles of Project: The facility or location is located within a 10-mile radius of the Project. Other locations may be utilized, if approved in writing, by Owner;
 3. Facility or location exclusive to Project's materials: Only materials for the Project are stored within the facility or location (or a secure portion of a facility or location set aside for the Project);
 4. Insurance provided on materials in facility or location: Contractor furnishes Owner a certificate of insurance extending Contractor's insurance coverage for damage, fire, and theft to cover the full value of all materials stored, or in transit;
 5. Facility or location locked and secure: The facility or location (or secure portion thereof) is continuously under lock and key, and only Contractor's authorized personnel shall have access;
 6. Owner right of access to facility or location: Owner shall at all times have the right of access in company of Contractor;
 7. Contractor assumes total responsibility for stored materials: Contractor and its surety assume total responsibility for the stored materials; and
 8. Contractor provides documentation and Notice when materials moved to site: Contractor furnishes to Owner certified lists of materials stored, bills of lading, invoices, and other information as may be required, and shall also furnish Notice to Owner when materials are moved from storage to the Project site.

6.04 PROGRESS PAYMENTS

- A. Owner to pay within 30 Days: Owner shall make progress payments, in such amounts as Owner determines are properly due, within 30 Days after receipt of a properly executed Application for Payment. Owner shall notify Contractor in accordance with chapter 39.76 RCW if the Application for Payment does not comply with the requirements of the Contract Documents.
- B. Withholding retainage; Options for retainage: Owner shall retain 5% of the amount of each progress payment until 45 Days after Final Acceptance and receipt of all documents required by law or the Contract Documents, including, at Owner's request, consent of surety to release of the retainage. In accordance with chapter 60.28 RCW, Contractor may request that monies reserved be retained in a fund by Owner, deposited by Owner in a bank or savings and loan, or placed in escrow with a bank or trust company to be converted into bonds and securities to be held in escrow with interest to be paid to Contractor. Owner may permit Contractor to provide an appropriate bond in lieu of the retained funds.

- C. Title passes to Owner upon payment: Title to all Work and materials covered by a progress payment shall pass to Owner at the time of such payment free and clear of all liens, claims, security interests, and encumbrances. Passage of title shall not, however, relieve Contractor from any of its duties and responsibilities for the Work or materials, or waive any rights of Owner to insist on full compliance by Contractor with the Contract Documents.
- D. Interest on unpaid balances: Payments due and unpaid in accordance with the Contract Documents shall bear interest as specified in chapter 39.76 RCW.

6.05 PAYMENTS WITHHELD

- A. Owner's right to withhold payment: Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any payment to such extent as may be necessary to protect Owner from loss or damage for reasons including but not limited to:
1. Non-compliant Work: Work not in accordance with the Contract Documents;
 2. Remaining Work to cost more than unpaid balance: Reasonable evidence that the Work required by the Contract Documents cannot be completed for the unpaid balance of the Contract Sum;
 3. Owner correction or completion Work: Work by Owner to correct defective Work or complete the Work in accordance with Section 5.16;
 4. Contractor's failure to perform: Contractor's failure to perform in accordance with the Contract Documents; or
 5. Contractor's negligent acts or omissions: Cost or liability that may occur to Owner as the result of Contractor's fault or negligent acts or omissions.
- B. Owner to notify Contractor of withholding for unsatisfactory performance: In any case where part or all of a payment is going to be withheld for unsatisfactory performance, Owner shall notify Contractor in accordance with chapter 39.76 RCW.

6.06 RETAINAGE AND BOND CLAIM RIGHTS

Chapters 39.08 RCW and 60.28 RCW incorporated by reference: Chapters 39.08 RCW and 60.28 RCW, concerning the rights and responsibilities of Contractor and Owner with regard to the performance and payment bonds and retainage, are made a part of the Contract Documents by reference as though fully set forth herein.

6.07 SUBSTANTIAL COMPLETION

Substantial Completion defined: Substantial Completion is the stage in the progress of the Work (or portion thereof designated and approved by Owner) when the construction is sufficiently complete, in accordance with the Contract Documents, so Owner has full and unrestricted use and benefit of the facilities (or portion thereof designated and approved by Owner) for the use for which it is intended. All Work other than incidental corrective or punch list work shall be completed. Substantial Completion shall not have been achieved if all systems and parts are not functional, if utilities are not connected and operating normally, if all required occupancy permits have not been issued, or if the Work is not accessible by normal vehicular and pedestrian traffic routes. The date Substantial Completion is achieved shall be established in writing by Owner. Contractor may request an early date of Substantial Completion which must be approved by Change Order. Owner's occupancy of the Work or designated portion thereof does not necessarily indicate that Substantial Completion has been achieved.

6.08 PRIOR OCCUPANCY

- A. Prior Occupancy defined; Restrictions: Owner may, upon written notice thereof to Contractor, take possession of or use any completed or partially completed portion of the Work ("Prior Occupancy") at any time prior to Substantial Completion. Unless otherwise agreed in writing, Prior Occupancy shall not: be deemed an acceptance of any portion of the Work; accelerate the time for any payment to Contractor; prejudice any rights of Owner provided by any insurance, bond, guaranty, or the Contract Documents; relieve Contractor of the risk of loss or any of the obligations established by the Contract Documents; establish a date for termination or partial termination of the assessment of liquidated damages; or constitute a waiver of claims.
- B. Damage; Duty to repair and warranties: Notwithstanding anything in the preceding paragraph, Owner shall be responsible for loss of or damage to the Work resulting from Prior Occupancy. Contractor's one year duty to repair any system warranties shall begin on building systems activated and used by Owner as agreed in writing by Owner and Contractor.

6.09 FINAL COMPLETION, ACCEPTANCE, AND PAYMENT

- A. Final Completion defined: Final Completion shall be achieved when the Work is fully and finally complete in accordance with the Contract Documents. The date Final Completion is achieved shall be established by Owner in writing, but in no case shall constitute Final Acceptance which is a subsequent, separate, and distinct action.
- B. Final Acceptance defined: Final Acceptance shall be achieved when the Contractor has completed the requirements of the Contract Documents. The date Final Acceptance is achieved shall be established by Owner in writing. Prior to Final Acceptance, Contractor shall, in addition to all other requirements in the Contract Documents, submit to Owner a written notice of any outstanding disputes or claims between Contractor and any of its Subcontractors, including the amounts and other details thereof. Neither Final Acceptance, nor final payment, shall release Contractor or its sureties from any obligations of these Contract Documents or the payment and performance bonds, or constitute a waiver of any claims by Owner arising from Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Final payment waives Claim rights: Acceptance of final payment by Contractor, or any Subcontractor, shall constitute a waiver and release to Owner of all claims by Contractor, or any such Subcontractor, for an increase in the Contract Sum or the Contract Time, and for every act or omission of Owner relating to or arising out of the Work, except for those Claims made in accordance with the procedures, including the time limits, set forth in Part 8.

PART 7 – CHANGES

7.01 CHANGE IN THE WORK

- A. Changes in Work, Contract Sum, and Contract Time by Change Order: Owner may, at any time and without notice to Contractor's surety, order additions, deletions, revisions, or other changes in the Work. These changes in the Work shall be incorporated into the Contract Documents through the execution of Change Orders. If any change in the Work ordered by Owner causes an increase or decrease in the Contract Sum or the Contract Time, an equitable adjustment shall be made as provided in Section 7.02 or 7.03, respectively, and such adjustment(s) shall be incorporated into a Change Order.
- B. Owner may request COP from Contractor: If Owner desires to order a change in the Work, it may request a written Change Order Proposal (COP) from Contractor. Contractor shall submit a Change Order Proposal within 14 Days of the request from Owner, or within such other period as mutually agreed. Contractor's Change Order Proposal shall be full compensation for

implementing the proposed change in the Work, including any adjustment in the Contract Sum or Contract Time, and including compensation for all delays in connection with such change in the Work and for any expense or inconvenience, disruption of schedule, or loss of efficiency or productivity occasioned by the change in the Work.

- C. COP negotiations: Upon receipt of the Change Order Proposal, or a request for equitable adjustment in the Contract Sum or Contract Time, or both, as provided in Sections 7.02 and 7.03, Owner may accept or reject the proposal, request further documentation, or negotiate acceptable terms with Contractor. Pending agreement on the terms of the Change Order, Owner may direct Contractor to proceed immediately with the Change Order Work. Contractor shall not proceed with any change in the Work until it has obtained Owner's approval. All Work done pursuant to any Owner-directed change in the Work shall be executed in accordance with the Contract Documents.
- D. Change Order as full payment and final settlement: If Owner and Contractor reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, such agreement shall be incorporated in a Change Order. The Change Order shall constitute full payment and final settlement of all claims for time and for direct, indirect, and consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity, related to any Work either covered or affected by the Change Order, or related to the events giving rise to the request for equitable adjustment.
- E. Failure to agree upon terms of Change Order; Final offer and Claims: If Owner and Contractor are unable to reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, Contractor may at any time in writing, request a final offer from Owner. Owner shall provide Contractor with its written response within 30 Days of Contractor's request. Owner may also provide Contractor with a final offer at any time. If Contractor rejects Owner's final offer, or the parties are otherwise unable to reach agreement, Contractor's only remedy shall be to file a Claim as provided in Part 8.
- F. Field Authorizations: The Owner may direct the Contractor to proceed with a change in the work through a written Field Authorization (also referred to as a Field Order) when the time required to price and execute a Change Order would impact the Project.

The Field Authorization shall describe and include the following:

1. The scope of work
2. An agreed upon maximum not-to-exceed amount
3. Any estimated change to the Contract Time
4. The method of final cost determination in accordance with the requirements of Part 7 of the General Conditions
5. The supporting cost data to be submitted in accordance with the requirements of Part 7 of the General Conditions

Upon satisfactory submittal by the Contractor and approval by the Owner of supporting cost data, a Change Order will be executed. The Owner will not make payment to the Contractor for Field Authorization work until that work has been incorporated into an executed Change Order.

7.02 CHANGE IN THE CONTRACT SUM

A. General Application

1. Contract Sum changes only by Change Order: The Contract Sum shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Sum in its Change Order Proposal.
2. Owner fault or negligence as basis for change in Contract Sum: If the cost of Contractor's performance is changed due to the fault or negligence of Owner, or anyone for whose acts Owner is responsible, Contractor shall be entitled to make a request for an equitable adjustment in the Contract Sum in accordance with the following procedure. No change in the Contract Sum shall be allowed to the extent: Contractor's changed cost of performance is due to the fault or negligence of Contractor, or anyone for whose acts Contractor is responsible; the change is concurrently caused by Contractor and Owner; or the change is caused by an act of Force Majeure as defined in Section 3.05.
 - (a) Notice and record keeping for equitable adjustment: A request for an equitable adjustment in the Contract Sum shall be based on written notice delivered to Owner within 7 Days of the occurrence of the event giving rise to the request. For purposes of this part, "occurrence" means when Contractor knew, or in its diligent prosecution of the Work should have known, of the event giving rise to the request. If Contractor believes it is entitled to an adjustment in the Contract Sum, Contractor shall immediately notify Owner and begin to keep and maintain complete, accurate, and specific daily records. Contractor shall give Owner access to any such records and, if requested shall promptly furnish copies of such records to Owner.
 - (b) Content of notice for equitable adjustment; Failure to comply: Contractor shall not be entitled to any adjustment in the Contract Sum for any occurrence of events or costs that occurred more than 7 Days before Contractor's written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the Contract Sum; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Sum requested. Failure to properly give such written notice shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.
 - (c) Contractor to provide supplemental information: Within 30 Days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with subparagraph a. above with additional supporting data. Such additional data shall include, at a minimum: the amount of compensation requested, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the damages claimed, but that the damages claimed were actually a result of the act, event, or condition complained of and that the Contract Documents provide entitlement to an equitable adjustment to Contractor for such act, event, or condition; and documentation sufficiently detailed to permit an informed analysis of the request by Owner. When the request for compensation relates to a delay, or other change in Contract Time, Contractor shall demonstrate the impact on the critical path, in accordance with Section 7.03C. Failure to provide such additional information and documentation within the time allowed or within the format required shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.

- (d) Contractor to proceed with Work as directed: Pending final resolution of any request made in accordance with this paragraph, unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work.
 - (e) Contractor to combine requests for same event together: Any requests by Contractor for an equitable adjustment in the Contract Sum and in the Contract Time that arise out of the same event(s) shall be submitted together.
3. Methods for calculating Change Order amount: The value of any Work covered by a Change Order, or of any request for an equitable adjustment in the Contract Sum, shall be determined by one of the following methods:
- a. Fixed Price: On the basis of a fixed price as determined in paragraph 7.02B.
 - b. Unit Prices: By application of unit prices to the quantities of the items involved as determined in paragraph 7.02C.
 - c. Time and Materials: On the basis of time and material as determined in paragraph 7.02D.
4. Fixed price method is default; Owner may direct otherwise: When Owner has requested Contractor to submit a Change Order Proposal, Owner may direct Contractor as to which method in subparagraph 3 above to use when submitting its proposal. Otherwise, Contractor shall determine the value of the Work, or of a request for an equitable adjustment, on the basis of the fixed price method.

B. Change Order Pricing – Fixed Price

Procedures: When the fixed price method is used to determine the value of any Work covered by a Change Order, or of a request for an equitable adjustment in the Contract Sum, the following procedures shall apply:

- 1. Breakdown and itemization of details on COP: Contractor's Change Order Proposal, or request for adjustment in the Contract Sum, shall be accompanied by a complete itemization of the costs, including labor, material, subcontractor costs, and overhead and profit. The costs shall be itemized in the manner set forth below, and shall be submitted on breakdown sheets in a form approved by Owner.
- 2. Use of industry standards in calculating costs: All costs shall be calculated based upon appropriate industry standard methods of calculating labor, material quantities, and equipment costs.
- 3. Costs contingent on Owner's actions: If any of Contractor's pricing assumptions are contingent upon anticipated actions of Owner, Contractor shall clearly state them in the proposal or request for an equitable adjustment.
- 4. Markups on additive and deductive Work: The cost of any additive or deductive changes in the Work shall be calculated as set forth below, except that overhead and profit shall not be included on deductive changes in the Work. Where a change in the Work involves additive and deductive work by the same Contractor or Subcontractor, small tools, overhead, profit, bond and insurance markups will apply to the net difference.
- 5. Breakdown not required if change less than \$1,000: If the total cost of the change in the Work or request for equitable adjustment does not exceed \$1,000, Contractor shall not be required to submit a breakdown if the description of the change in the Work or request for equitable adjustment is sufficiently definitive for Owner to determine fair value.

6. Breakdown required if change between \$1,000 and \$2,500: If the total cost of the change in the Work or request for equitable adjustment is between \$1,000 and \$2,500, Contractor may submit a breakdown in the following level of detail if the description of the change in the Work or if the request for equitable adjustment is sufficiently definitive to permit the Owner to determine fair value:
- a. lump sum labor;
 - b. lump sum material;
 - c. lump sum equipment usage;
 - d. overhead and profit as set forth below; and
 - e. insurance and bond costs as set forth below.
7. Components of increased cost: Any request for adjustment of Contract Sum based upon the fixed price method shall include only the following items:
- a. Craft labor costs: These are the labor costs determined by multiplying the estimated or actual additional number of craft hours needed to perform the change in the Work by the hourly labor costs. Craft hours should cover direct labor, as well as indirect labor due to trade inefficiencies. The hourly costs shall be based on the following:
 - (1) Basic wages and benefits: Hourly rates and benefits as stated on the Department of Labor and Industries approved "statement of intent to pay prevailing wages" or a higher amount if approved by the Owner. Direct supervision shall be a reasonable percentage not to exceed 15% of the cost of direct labor. No supervision markup shall be allowed for a working supervisor's hours.
 - (2) Worker's insurance: Direct contributions to the state of Washington for industrial insurance; medical aid; and supplemental pension, by the class and rates established by the Department of Labor and Industries.
 - (3) Federal insurance: Direct contributions required by the Federal Insurance Compensation Act; Federal Unemployment Tax Act; and the State Unemployment Compensation Act.
 - (4) Travel allowance: Travel allowance and/or subsistence, if applicable, not exceeding those allowances established by regional labor union agreements, which are itemized and identified separately.
 - (5) Safety: Cost incurred due to the Washington Industrial Safety and Health Act, which shall be a reasonable percentage not to exceed 2% of the sum of the amounts calculated in (1), (2), and (3) above.
 - b. Material costs: This is an itemization of the quantity and cost of materials needed to perform the change in the Work. Material costs shall be developed first from actual known costs, second from supplier quotations or if these are not available, from standard industry pricing guides. Material costs shall consider all available discounts. Freight costs, express charges, or special delivery charges, shall be itemized.

c. Equipment costs: This is an itemization of the type of equipment and the estimated or actual length of time the construction equipment appropriate for the Work is or will be used on the change in the Work. Costs will be allowed for construction equipment only if used solely for the changed Work, or for additional rental costs actually incurred by the Contractor. Equipment charges shall be computed on the basis of actual invoice costs or if owned, from the current edition of one of the following sources:

- (1) Associated General Contractors Washington State Department of Transportation (AGC WSDOT) Equipment Rental Agreement current edition, on the Contract execution date.
- (2) The National Electrical Contractors Association for equipment used on electrical work.
- (3) The Mechanical Contractors Association of America for equipment used on mechanical work.

The EquipmentWatch Rental Rate Blue Book shall be used as a basis for establishing rental rates of equipment not listed in the above sources. The maximum rate for standby equipment shall not exceed that shown in the AGC WSDOT Equipment Rental Agreement, current edition on the Contract execution date.

d. Allowance for small tools, expendables & consumable supplies: Small tools consist of tools which cost \$250 or less and are normally furnished by the performing contractor. The maximum rate for small tools shall not exceed the following:

- (1) 3% for Contractor: For Contractor, 3% of direct labor costs.
- (2) 5% for Subcontractors: For Subcontractors, 5% of direct labor costs.

Expendables and consumables supplies directly associated with the change in Work must be itemized.

e. Subcontractor costs: This is defined as payments Contractor makes to Subcontractors for changed Work performed by Subcontractors of any tier. The Subcontractors' cost of Work shall be calculated and itemized in the same manner as prescribed herein for Contractor.

f. Allowance for overhead: This is defined as costs of any kind attributable to direct and indirect delay, acceleration, or impact, added to the total cost to Owner of any change in the Contract Sum. If the Contractor is compensated under Section 7.03D, the amount of such compensation shall be reduced by the amount Contractor is otherwise entitled to under this subsection (f). This allowance shall compensate Contractor for all noncraft labor, temporary construction facilities, field engineering, schedule updating, as-built drawings, home office cost, B&O taxes, office engineering, estimating costs, additional overhead because of extended time, and any other cost incidental to the change in the Work. It shall be strictly limited in all cases to a reasonable amount, mutually acceptable, or if none can be agreed upon to an amount not to exceed the rates below:

- (1) Projects less than \$3 million: For projects where the Contract Award Amount is under \$3 million, the following shall apply:

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- (a) Contractor markup on Contractor Work: For Contractor, for any Work actually performed by Contractor's own forces, 16% of the first \$50,000 of the cost, and 4% of the remaining cost, if any.
 - (b) Subcontractor markup for Subcontractor Work: For each Subcontractor (including lower tier subcontractors), for any Work actually performed by its own forces, 16% of the first \$50,000 of the cost, and 4% of the remaining cost, if any.
 - (c) Contractor markup for Subcontractor Work: For Contractor, for any work performed by its Subcontractor(s) 6% of the first \$50,000 of the amount due each Subcontractor, and 4% of the remaining amount if any.
 - (d) Subcontractor markup for lower tier Subcontractor Work: For each Subcontractor, for any Work performed by its Subcontractor(s) of any lower tier, 4% of the first \$50,000 of the amount due the sub-Subcontractor, and 2% of the remaining amount if any.
 - (e) Basis of cost applicable for markup: The cost to which overhead is to be applied shall be developed in accordance with Section 7.02B 7a. – e.
- (2). Projects more than \$3 million: For projects where the Contract Award Amount is equal to or exceeds \$3 million, the following shall apply:
- (a) Contractor markup on Contractor Work: For Contractor, for any Work actually performed by Contractor's own forces, 12% of the first \$50,000 of the cost, and 4% of the remaining cost, if any.
 - (b) Subcontractor markup for Subcontractor Work: For each Subcontractor (including lower tier subcontractors), for any Work actually performed by its own forces, 12% of the first \$50,000 of the cost, and 4% of the remaining cost, if any.
 - (c) Contractor markup for Subcontractor Work: For Contractor, for any Work performed by its Subcontractor(s), 4% of the first \$50,000 of the amount due each Subcontractor, and 2% of the remaining amount if any.
 - (d) Subcontractor markup for lower tier Subcontractor Work: For each Subcontractor, for any Work performed by its Subcontractor(s) of any lower tier, 4% of the first \$50,000 of the amount due the sub-Subcontractor, and 2% of the remaining amount if any.
 - (e) Basis of cost applicable for markup: The cost to which overhead is to be applied shall be developed in accordance with Section 7.02B 7a. – e.
- g. Allowance for profit: Allowance for profit is an amount to be added to the cost of any change in contract sum, but not to the cost of change in Contract Time for which contractor has been compensated pursuant to the conditions set forth in Section 7.03. It shall be limited to a reasonable amount, mutually acceptable, or if none can be agreed upon, to an amount not to exceed the rates below:
- (1) Contractor / Subcontractor markup for self-performed Work: For Contractor or Subcontractor of any tier for work performed by their forces, 6% of the cost developed in accordance with Section 7.02B 7a. – e.

- (2) Contractor / Subcontractor markup for Work performed at lower tier: For Contractor or Subcontractor of any tier for work performed by a subcontractor of a lower tier, 4% of the subcontract cost developed in accordance with Section 7.02B 7a. – h.
- h. Insurance and bond premiums: Cost of change in insurance or bond premium: This is defined as:
 - (1) Contractor's liability insurance: The cost of any changes in Contractor's liability insurance arising directly from execution of the Change Order; and
 - (2) Payment and Performance Bond: The cost of the additional premium for Contractor's bond arising directly from the changed Work.

The cost of any change in insurance or bond premium shall be added after overhead and allowance for profit are calculated in accordance with subparagraph f. and g above.

C. Change Order Pricing – Unit Prices

- 1. Content of Owner authorization: Whenever Owner authorizes Contractor to perform Work on a unit-price basis, Owner's authorization shall clearly state:
 - a. Scope: Scope of work to be performed;
 - b. Reimbursement basis: Type of reimbursement including pre-agreed rates for material quantities; and
 - c. Reimbursement limit: Cost limit of reimbursement.
- 2. Contractor responsibilities: Contractor shall:
 - a. Cooperate with Owner and assist in monitoring the Work being performed. As requested by Owner, Contractor shall identify workers assigned to the Change Order Work and areas in which they are working;
 - b. Leave access as appropriate for quantity measurement; and
 - c. Not exceed any cost limit(s) without Owner's prior written approval.
- 3. Cost breakdown consistent with Fixed Price requirements: Contractor shall submit costs in accordance with paragraph 7.02B and satisfy the following requirements:
 - a. Unit prices must include overhead, profit, bond and insurance premiums: Unit prices shall include reimbursement for all direct and indirect costs of the Work, including overhead, profit, bond, and insurance costs; and
 - b. Owner verification of quantities: Quantities must be supported by field measurement statements signed by Owner.

D. Change Order Pricing – Time-and-Material Prices

- 1. Content of Owner authorization: Whenever Owner authorizes Contractor to perform Work on a time-and-material basis, Owner's authorization shall clearly state:
 - a. Scope: Scope of Work to be performed;

- b. Reimbursement basis: Type of reimbursement including pre-agreed rates, if any, for material quantities or labor; and
 - c. Reimbursement limit: Cost limit of reimbursement.
2. Contractor responsibilities: Contractor shall:
- a. Identify workers assigned: Cooperate with Owner and assist in monitoring the Work being performed. As requested by Owner, identify workers assigned to the Change Order Work and areas in which they are working;
 - b. Provide daily timesheets: Identify on daily time sheets all labor performed in accordance with this authorization. Submit copies of daily time sheets within 2 working days for Owner's review.
 - c. Allow Owner to measure quantities: Leave access as appropriate for quantity measurement;
 - d. Perform Work efficiently: Perform all Work in accordance with this section as efficiently as possible; and
 - e. Not exceed Owner's cost limit: Not exceed any cost limit(s) without Owner's prior written approval.
3. Cost breakdown consistent with Fixed Price requirements: Contractor shall submit costs in accordance with paragraph 7.02B and additional verification supported by:
- a. Timesheets: Labor detailed on daily time sheets; and
 - b. Invoices: Invoices for material.

7.03 CHANGE IN THE CONTRACT TIME

- A. COP requests for Contract Time: The Contract Time shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Time in its Change Order Proposal.
- B. Time extension permitted if not Contractor's fault: If the time of Contractor's performance is changed due to an act of Force Majeure, or due to the fault or negligence of Owner or anyone for whose acts Owner is responsible, Contractor shall be entitled to make a request for an equitable adjustment in the Contract Time in accordance with the following procedure. No adjustment in the Contract Time shall be allowed to the extent Contractor's changed time of performance is due to the fault or negligence of Contractor, or anyone for whose acts Contractor is responsible.
- 1. Notice and record keeping for Contract Time request: A request for an equitable adjustment in the Contract Time shall be based on written notice delivered within 7 Days of the occurrence of the event giving rise to the request. If Contractor believes it is entitled to adjustment of Contract Time, Contractor shall immediately notify Owner and begin to keep and maintain complete, accurate, and specific daily records. Contractor shall give Owner access to any such record and if requested, shall promptly furnish copies of such record to Owner.
 - 2. Timing and content of Contractor's Notice: Contractor shall not be entitled to an adjustment in the Contract Time for any events that occurred more than 7 Days before Contractor's written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the

Contract Time; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Time requested. Failure to properly give such written notice shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.

3. Contractor to provide supplemental information: Within 30 Days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with subparagraph 7.03B.2 with additional supporting data. Such additional data shall include, at a minimum: the amount of delay claimed, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the delay claimed, but that the delay claimed was actually a result of the act, event, or condition complained of, and that the Contract Documents provide entitlement to an equitable adjustment in Contract Time for such act, event, or condition; and supporting documentation sufficiently detailed to permit an informed analysis of the request by Owner. Failure to provide such additional information and documentation within the time allowed or within the format required shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.
 4. Contractor to proceed with Work as directed: Pending final resolution of any request in accordance with this paragraph, unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work.
- C. Contractor to demonstrate impact on critical path of schedule: Any change in the Contract Time covered by a Change Order, or based on a request for an equitable adjustment in the Contract Time, shall be limited to the change in the critical path of Contractor's schedule attributable to the change of Work or event(s) giving rise to the request for equitable adjustment. Any Change Order Proposal or request for an adjustment in the Contract Time shall demonstrate the impact on the critical path of the schedule. Contractor shall be responsible for showing clearly on the Progress Schedule that the change or event: had a specific impact on the critical path, and except in case of concurrent delay, was the sole cause of such impact; and could not have been avoided by resequencing of the Work or other reasonable alternatives.
- D. Cost of change in Contract Time: Contractor may request compensation for the cost of a change in Contract Time in accordance with this paragraph, 7.03D, subject to the following conditions:
1. Must be solely fault of Owner or A/E: The change in Contract Time shall solely be caused by the fault or negligence of Owner or A/E;
 2. Procedures: Contractor shall follow the procedure set forth in paragraph 7.03B;
 3. Demonstrate impact on critical path: Contractor shall establish the extent of the change in Contract Time in accordance with paragraph 7.03C; and
 4. Limitations on daily costs: The daily cost of any change in Contract Time shall be limited to the items below, less the amount of any change in the Contract Sum the Contractor may otherwise be entitled to pursuant to Section 7.02B 7f for any change in the Work that contributed to this change in Contract Time:
 - a. Non-productive supervision or labor: cost of nonproductive field supervision or labor extended because of delay;
 - b. Weekly meetings and indirect activities: cost of weekly meetings or similar indirect activities extended because of the delay;

- c. Temporary facilities or equipment rental: cost of temporary facilities or equipment rental extended because of the delay;
- d. Insurance premiums: cost of insurance extended because of the delay;
- e. Overhead: general and administrative overhead in an amount to be agreed upon, but not to exceed 3% of the Contract Award Amount divided by the originally specified Contract Time for each Day of the delay.

PART 8 – CLAIMS AND DISPUTE RESOLUTION

8.01 CLAIMS PROCEDURE

- A. Claim is Contractor's remedy: If the parties fail to reach agreement on the terms of any Change Order for Owner-directed Work as provided in Section 7.01, or on the resolution of any request for an equitable adjustment in the Contract Sum as provided in Section 7.02 or the Contract Time as provided in Section 7.03, Contractor's only remedy shall be to file a Claim with Owner as provided in this section.
- B. Claim filing deadline for Contractor: Contractor shall file its Claim within 120 Days from Owner's final offer made in accordance with paragraph 7.01E, or by the date of Final Acceptance, whichever occurs first.
- C. Claim must cover all costs and be documented: The Claim shall be deemed to cover all changes in cost and time (including direct, indirect, impact, and consequential) to which Contractor may be entitled. It shall be fully substantiated and documented. At a minimum, the Claim shall contain the following information:
 - 1. Factual statement of Claim: A detailed factual statement of the Claim for additional compensation and time, if any, providing all necessary dates, locations, and items of Work affected by the Claim;
 - 2. Dates: The date on which facts arose which gave rise to the Claim;
 - 3. Owner and A/E employee's knowledgeable about Claim: The name of each employee of Owner or A/E knowledgeable about the Claim;
 - 4. Support from Contract Documents: The specific provisions of the Contract Documents which support the Claim;
 - 5. Identification of other supporting information: The identification of any documents and the substance of any oral communications that support the Claim;
 - 6. Copies of supporting documentation: Copies of any identified documents, other than the Contract Documents, that support the Claim;
 - 7. Details on Claim for Contract Time: If an adjustment in the Contract Time is sought: the specific days and dates for which it is sought; the specific reasons Contractor believes an extension in the Contract Time should be granted; and Contractor's analysis of its Progress Schedule to demonstrate the reason for the extension in Contract Time;
 - 8. Details on Claim for adjustment of Contract Sum: If an adjustment in the Contract Sum is sought, the exact amount sought and a breakdown of that amount into the categories set forth in, and in the detail as required by Section 7.02; and

9. Statement certifying Claim: A statement certifying, under penalty of perjury, that the Claim is made in good faith, that the supporting cost and pricing data are true and accurate to the best of Contractor's knowledge and belief, that the Claim is fully supported by the accompanying data, and that the amount requested accurately reflects the adjustment in the Contract Sum or Contract Time for which Contractor believes Owner is liable.
- D. Owner's response to Claim filed: After Contractor has submitted a fully documented Claim that complies with all applicable provisions of Parts 7 and 8, Owner shall respond, in writing, to Contractor as follows:
1. Response time for Claim less than \$50,000: If the Claim amount is less than \$50,000, with a decision within 60 Days from the date the Claim is received; or
 2. Response time for Claim of \$50,000 or more: If the Claim amount is \$50,000 or more, with a decision within 60 Days from the date the Claim is received, or with notice to Contractor of the date by which it will render its decision. Owner will then respond with a written decision in such additional time.
- E. Owner's review of Claim and finality of decision: To assist in the review of Contractor's Claim, Owner may visit the Project site, or request additional information, in order to fully evaluate the issues raised by the Claim. Contractor shall proceed with performance of the Work pending final resolution of any Claim. Owner's written decision as set forth above shall be final and conclusive as to all matters set forth in the Claim, unless Contractor follows the procedure set forth in Section 8.02.
- F. Waiver of Contractor rights for failure to comply with this Section: Any Claim of the Contractor against the Owner for damages, additional compensation, or additional time, shall be conclusively deemed to have been waived by the Contractor unless made in accordance with the requirements of this Section.

8.02 ARBITRATION

- A. Timing of Contractor's demand for arbitration: If Contractor disagrees with Owner's decision rendered in accordance with paragraph 8.01D, Contractor shall provide Owner with a written demand for arbitration. No demand for arbitration of any such Claim shall be made later than 30 Days after the date of Owner's decision on such Claim; failure to demand arbitration within said 30 Day period shall result in Owner's decision being final and binding upon Contractor and its Subcontractors.
- B. Filing of Notice for arbitration: Notice of the demand for arbitration shall be filed with the American Arbitration Association (AAA), with a copy provided to Owner. The parties shall negotiate or mediate under the Voluntary Construction Mediation Rules of the AAA, or mutually acceptable service, before seeking arbitration in accordance with the Construction Industry Arbitration Rules of AAA as follows:
1. Claims less than \$30,000: Disputes involving \$30,000 or less shall be conducted in accordance with the Northwest Region Expedited Commercial Arbitration Rules; or
 2. Claims greater than \$30,000: Disputes over \$30,000 shall be conducted in accordance with the Construction Industry Arbitration Rules of the AAA, unless the parties agree to use the expedited rules.
- C. Arbitration is forum for resolving Claims: All Claims arising out of the Work shall be resolved by arbitration. The judgment upon the arbitration award may be entered, or review of the award may

occur, in the superior court having jurisdiction thereof. No independent legal action relating to or arising from the Work shall be maintained.

- D. Owner may combine Claims into same arbitration: Claims between Owner and Contractor, Contractor and its Subcontractors, Contractor and A/E, and Owner and A/E shall, upon demand by Owner, be submitted in the same arbitration or mediation.
- E. Settlement outside of arbitration to be documented in Change Order: If the parties resolve the Claim prior to arbitration judgment, the terms of the resolution shall be incorporated in a Change Order. The Change Order shall constitute full payment and final settlement of the Claim, including all claims for time and for direct, indirect, or consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity.

8.03 CLAIMS AUDITS

- A. Owner may audit Claims: All Claims filed against Owner shall be subject to audit at any time following the filing of the Claim. Failure of Contractor, or Subcontractors of any tier, to maintain and retain sufficient records to allow Owner to verify all or a portion of the Claim or to permit Owner access to the books and records of Contractor, or Subcontractors of any tier, shall constitute a waiver of the Claim and shall bar any recovery.
- B. Contractor to make documents available: In support of Owner audit of any Claim, Contractor shall, upon request, promptly make available to Owner the following documents:
 - 1. Daily time sheets and supervisor's daily reports;
 - 2. Collective bargaining agreements;
 - 3. Insurance, welfare, and benefits records;
 - 4. Payroll registers;
 - 5. Earnings records;
 - 6. Payroll tax forms;
 - 7. Material invoices, requisitions, and delivery confirmations;
 - 8. Material cost distribution worksheet;
 - 9. Equipment records (list of company equipment, rates, etc.);
 - 10. Vendors', rental agencies', Subcontractors', and agents' invoices;
 - 11. Contracts between Contractor and each of its Subcontractors, and all lower-tier Subcontractor contracts and supplier contracts;
 - 12. Subcontractors' and agents' payment certificates;
 - 13. Cancelled checks (payroll and vendors);
 - 14. Job cost report, including monthly totals;
 - 15. Job payroll ledger;
 - 16. Planned resource loading schedules and summaries;

17. General ledger;
 18. Cash disbursements journal;
 19. Financial statements for all years reflecting the operations on the Work. In addition, the Owner may require, if it deems it appropriate, additional financial statements for 3 years preceding execution of the Work;
 20. Depreciation records on all company equipment whether these records are maintained by the company involved, its accountant, or others;
 21. If a source other than depreciation records is used to develop costs for Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents;
 22. All nonprivileged documents which relate to each and every Claim together with all documents which support the amount of any adjustment in Contract Sum or Contract Time sought by each Claim;
 23. Work sheets or software used to prepare the Claim establishing the cost components for items of the Claim including but not limited to labor, benefits and insurance, materials, equipment, Subcontractors, all documents which establish the time periods, individuals involved, the hours for the individuals, and the rates for the individuals; and
 24. Work sheets, software, and all other documents used by Contractor to prepare its bid.
- C. Contractor to provide facilities for audit and shall cooperate: The audit may be performed by employees of Owner or a representative of Owner. Contractor, and its Subcontractors, shall provide adequate facilities acceptable to Owner, for the audit during normal business hours. Contractor, and all Subcontractors, shall make a good faith effort to cooperate with Owner's auditors.

PART 9 – TERMINATION OF THE WORK

9.01 TERMINATION BY OWNER FOR CAUSE

- A. 7 Day Notice to Terminate for Cause: Owner may, upon 7 Days written notice to Contractor and to its surety, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for cause upon the occurrence of any one or more of the following events:
1. Contractor fails to prosecute Work: Contractor fails to prosecute the Work or any portion thereof with sufficient diligence to ensure Substantial Completion of the Work within the Contract Time;
 2. Contractor bankrupt: Contractor is adjudged bankrupt, makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency;
 3. Contractor fails to correct Work: Contractor fails in a material way to replace or correct Work not in conformance with the Contract Documents;
 4. Contractor fails to supply workers or materials: Contractor repeatedly fails to supply skilled workers or proper materials or equipment;
 5. Contractor failure to pay Subcontractors or labor: Contractor repeatedly fails to make prompt payment due to Subcontractors or for labor;

6. Contractor violates laws: Contractor materially disregards or fails to comply with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction; or
 7. Contractor in material breach of Contract: Contractor is otherwise in material breach of any provision of the Contract Documents.
- B. Owner's actions upon termination: Upon termination, Owner may at its option:
1. Take possession of Project site: Take possession of the Project site and take possession of or use all materials, equipment, tools, and construction equipment and machinery thereon owned by Contractor to maintain the orderly progress of, and to finish, the Work;
 2. Accept assignment of Subcontracts: Accept assignment of subcontracts pursuant to Section 5.20; and
 3. Finish the Work: Finish the Work by whatever other reasonable method it deems expedient.
- C. Surety's role: Owner's rights and duties upon termination are subject to the prior rights and duties of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.
- D. Contractor's required actions: When Owner terminates the Work in accordance with this section, Contractor shall take the actions set forth in paragraph 9.02B, and shall not be entitled to receive further payment until the Work is accepted.
- E. Contractor to pay for unfinished Work: If the unpaid balance of the Contract Sum exceeds the cost of finishing the Work, including compensation for A/E's services and expenses made necessary thereby and any other extra costs or damages incurred by Owner in completing the Work, or as a result of Contractor's actions, such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor shall pay the difference to Owner. These obligations for payment shall survive termination.
- F. Contractor and Surety still responsible for Work performed: Termination of the Work in accordance with this section shall not relieve Contractor or its surety of any responsibilities for Work performed.
- G. Conversion of "Termination for Cause" to "Termination for Convenience": If Owner terminates Contractor for cause and it is later determined that none of the circumstances set forth in paragraph 9.01A exist, then such termination shall be deemed a termination for convenience pursuant to Section 9.02.

9.02 TERMINATION BY OWNER FOR CONVENIENCE

- A. Owner Notice of Termination for Convenience: Owner may, upon written notice, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for the convenience of Owner.
- B. Contractor response to termination Notice: Unless Owner directs otherwise, after receipt of a written notice of termination for either cause or convenience, Contractor shall promptly:
1. Cease Work: Stop performing Work on the date and as specified in the notice of termination;

2. No further orders or Subcontracts: Place no further orders or subcontracts for materials, equipment, services or facilities, except as may be necessary for completion of such portion of the Work as is not terminated;
 3. Cancel orders and Subcontracts: Cancel all orders and subcontracts, upon terms acceptable to Owner, to the extent that they relate to the performance of Work terminated;
 4. Assign orders and Subcontracts to Owner: Assign to Owner all of the right, title, and interest of Contractor in all orders and subcontracts;
 5. Take action to protect the Work: Take such action as may be necessary or as directed by Owner to preserve and protect the Work, Project site, and any other property related to this Project in the possession of Contractor in which Owner has an interest; and
 6. Continue performance not terminated: Continue performance only to the extent not terminated
- C. Terms of adjustment in Contract Sum if Contract terminated: If Owner terminates the Work or any portion thereof for convenience, Contractor shall be entitled to make a request for an equitable adjustment for its reasonable direct costs incurred prior to the effective date of the termination, plus reasonable allowance for overhead and profit on Work performed prior to termination, plus the reasonable administrative costs of the termination, but shall not be entitled to any other costs or damages, whatsoever, provided however, the total sum payable upon termination shall not exceed the Contract Sum reduced by prior payments. Contractor shall be required to make its request in accordance with the provisions of Part 7.
- D. Owner to determine whether to adjust Contract Time: If Owner terminates the Work or any portion thereof for convenience, the Contract Time shall be adjusted as determined by Owner.

PART 10 – MISCELLANEOUS PROVISIONS

10.01 GOVERNING LAW

Applicable law and venue: The Contract Documents and the rights of the parties herein shall be governed by the laws of the state of Washington. Venue shall be in the county in which Owner's principal place of business is located, unless otherwise specified.

10.02 SUCCESSORS AND ASSIGNS

Bound to successors; Assignment of Contract: Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Neither party shall assign the Work without written consent of the other, except that Contractor may assign the Work for security purposes, to a bank or lending institution authorized to do business in the state of Washington. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations set forth in the Contract Documents.

10.03 MEANING OF WORDS

Meaning of words used in Specifications: Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the code of any governmental authority,

whether such reference be specific or by implication, shall be to the latest standard specification, manual, or code in effect on the date for submission of bids, except as may be otherwise specifically stated. Wherever in these Drawings and Specifications an article, device, or piece of equipment is referred to in the singular manner, such reference shall apply to as many such articles as are shown on the drawings, or required to complete the installation.

10.04 RIGHTS AND REMEDIES

No waiver of rights: No action or failure to act by Owner or A/E shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor shall action or failure to act constitute approval or an acquiescence in a breach therein, except as may be specifically agreed in writing.

10.05 CONTRACTOR REGISTRATION

Contractor must be registered or licensed: Pursuant to RCW 39.06, Contractor shall be registered or licensed as required by the laws of the State of Washington, including but not limited to RCW 18.27.

10.06 TIME COMPUTATIONS

Computing time: When computing any period of time, the day of the event from which the period of time begins shall not be counted. The last day is counted unless it falls on a weekend or legal holiday, in which event the period runs until the end of the next day that is not a weekend or holiday. When the period of time allowed is less than 7 days, intermediate Saturdays, Sundays, and legal holidays are excluded from the computation.

10.07 RECORDS RETENTION

Six year records retention period: The wage, payroll, and cost records of Contractor, and its Subcontractors, and all records subject to audit in accordance with Section 8.03, shall be retained for a period of not less than 6 years after the date of Final Acceptance.

10.08 THIRD-PARTY AGREEMENTS

No third party relationships created: The Contract Documents shall not be construed to create a contractual relationship of any kind between: A/E and Contractor; Owner and any Subcontractor; or any persons other than Owner and Contractor.

10.09 ANTITRUST ASSIGNMENT

Contractor assigns overcharge amounts to Owner: Owner and Contractor recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the purchaser. Therefore, Contractor hereby assigns to Owner any and all claims for such overcharges as to goods, materials, and equipment purchased in connection with the Work performed in accordance with the Contract Documents, except as to overcharges which result from antitrust violations commencing after the Contract Sum is established and which are not passed on to Owner under a Change Order. Contractor shall put a similar clause in its Subcontracts, and require a similar clause in its sub-Subcontracts, such that all claims for such overcharges on the Work are passed to Owner by Contractor.

10.10 HEADINGS AND CAPTIONS

Headings for convenience only: All headings and captions used in these General Conditions are only for convenience of reference, and shall not be used in any way in connection with the meaning, effect, interpretation, construction, or enforcement of the General Conditions, and do not define the limit or describe the scope or intent of any provision of these General Conditions.

P A R T I V

**SUPPLEMENTAL CONDITIONS AS MODIFIED BY THE CITY OF
TACOMA**

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Section 00 73 00

PART 1 GENERAL PROVISIONS

1.01 DEFINITIONS

Replace Article H in Section 1.01 with the following City Supplemental Conditions:

AI. "Contract Time" is the number of calendar days or the dates stated in the Contract to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Owner for final payment.

Replace Article O in Section 1.01 with the following City Supplemental Conditions:

O. "Notice" means a written or electronic notice which has been delivered to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended or, if delivered or sent by registered or certified mail to the last business address known to the party giving notice.

Replace Article Q in Section 1.01 with the following City Supplemental Conditions:

Q. "Owner" means the City or its authorized representative with the authority to enter into, administer, and/or terminate the work in accordance with the Contract Documents and make related determinations and findings.

Add the following articles to Section 1.01 of Supplemental Conditions:

AC. "Abbreviations" refer to trade association names and titles of general standards that are frequently abbreviated. Where such acronyms or abbreviations are used in the specifications or other Contract documents, they mean recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations" published by Gale Research Co., available in most libraries.

AD. "Alternate Bid" (or Alternate) is an amount stated in the Bid to be added or deducted from the amount of the Base Bid if the corresponding change in project scope or materials or methods of construction described in the Bidding Documents is accepted.

AE. "Base Bid" is the sum stated in the Bid for which the Bidder offers to perform the work described as the base, to which work may be added or deducted for sums stated in Alternate Bids and Unit Prices. The Base Bid does not include Force Account work and taxes.

AF. "Calendar Day" is the 24-hour period from midnight to midnight. AG. "City" is the City of Tacoma.

AH. "Contracting Agency" (or City) is the City of Tacoma.

AI. "Contract Provisions" is the publication addressing the work required for an individual project. At the time of the call for bids, the Contract provisions may include, for a specific individual project, the general conditions, supplements to the general conditions, the special provisions, a listing of the applicable standard plans, the prevailing minimum hourly wage rates, Contract forms, affirmative action requirements, and LEAP.

AJ. "Engineer" is the City of Tacoma's registered design professional who will act as the City's authorized representative when so designated by the City.

AK. "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and other.

AL. "Holiday(s)" means the following calendar days: January 1st, 3rd Monday of January, 3rd Monday of February, last Monday of May, July 4th, 1st Monday of September, November 11th, 4th Thursday of November, 4th Friday of November, December 25th. If a holiday is on a Saturday, the previous Friday will be observed as a holiday. If the holiday is on a Sunday, the following Monday will be observed as a holiday.

AM. "Indicated" refers to graphic representations, notes or schedules on the drawings, or other paragraphs or schedules in the specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limit on location is intended.

AN. "Install" is used to describe operations at the project site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

AO. "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or Contractor of lower tier for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

AP. "Milestone" means a principal event specified in the Contract Documents relating to an intermediate completion date or time for a Phase prior to Substantial Completion of all Work. Milestones may be adjusted at the sole discretion of the Owner.

AQ. "Provide" means to furnish and install, complete and ready for intended use.

AR. "Project Site" is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the project. The extent of the project site is shown in the plans and may or may not be identical with the description of the land on which

the project is to be built.

AS. "Request for Information" is a request from the Contractor to the Owner seeking an interpretation or a clarification of some requirement of the Contract Documents.

AT. "Unit Price" is an amount stated in the Bid as a price per unit of measurement for materials or services as described in the Contract Documents.

AU. "Utility Owner" is used to describe a service, light, power, water, gas, and telecommunications by a public utility.

1.02 ORDER OF PRECEDENCE

Replace the entire Section 1.02 with the following City Supplemental Conditions:

Any conflict or inconsistency in the Contract Documents shall be resolved by giving the documents precedence in the following order:

1. Signed Public Works Contract, including any Change Orders, and any Special Forms.
2. Addenda issued during the bidding period.
3. Washington State Department of Ecology Requirements
4. United States Environmental Protection Agency Requirements
5. City of Tacoma General Provisions
6. Supplemental Conditions as modified by the City of Tacoma.
7. General Conditions for Washington State Facility Construction.
8. Specifications – provisions in Division 1 shall take precedence over provisions of any other Division.
9. Drawings – in case of conflict within the Drawings, large scale drawings shall take precedence over small scale drawings.
10. Construction Documents Appendices.
11. Signed and Completed Bid Proposal Form.
12. Special Notice to Bidders.
13. Advertisement for Bids.
14. Supplemental Documentation.
15. Reference Documents.

1.03 EXECUTION AND INTENT

Replace Section 1.03.2 with the following City Supplemental Conditions:

2. Contractor familiar with project: Contractor has carefully reviewed the Contract Documents, become familiar with the local conditions in which the Work is to be performed, and satisfied itself as to the nature, location, character, quality and quantity of the Work, the labor, materials, equipment, goods, supplies, work,

services and other items to be furnished and all other requirements of the Contract Documents, as well as the surface and subsurface conditions and other matters that may be encountered at the Project site or affect performance of the Work or the cost or difficulty thereof;

Add the following paragraph to Section 1.03 of City Supplemental Conditions:

The intent of the Contract is to be prescribing a complete work. Omissions from the Contract of details of work, which are necessary to carry out the Contract, shall not relieve the Contractor from performing the omitted work.

1.04 SUBSTITUTIONS

Add the following new Section 1.04 to General Provisions:

A. Approved Equals

1. Unless an item is indicated as No substitute", special brands, when named, are intended to describe the standard of quality, performance or usedesired. Equal items will be considered by the City, provided that the respondent specifies the brand and model, and provides all the descriptive literature, independent test results, product samples, local servicing and parts availability to enable the City to evaluate the proposed "equal".
2. The decision of the City as to what items are equal shall be final and conclusive. If the City elects to purchase a brand represented by the respondent to be an "equal", the City's acceptance of the item is conditioned on the City's inspection and testing after receipt. If, in the sole judgement of the City, the item is determined not to be an equal, the item shall be returned at the respondent's expense.
3. When the brand name, or level of quality is not stated by the respondent, it is understood the offer is exactly as specified. If more than one brand name is specified, respondent must clearly indicate the brand and model/part number being bid.

B. Substitution Requests Prior to Bid: Refer to Bid Submittal Package and Specification Section 01_33_00, Product Requirements for allowable process for substitutions prior to the bid.

C. Substitution Requests made after Award of Contract: Requests for approval of substitute materials or products will not be considered, except if one or more of the following conditions exists.

1. Indicate one or more reasons why substitution is required with Substitution Request.
 - a. Unavailability: A substitution is required because the specified item is not available, due to factors beyond the control of the Contractor or subcontractor. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the work promptly or coordinate activities properly.
 - b. Unsuitability: Subsequent information or changes disclose inability of the specified item to perform as intended, and where the Contractor certifies that the proposed substitution will overcome such non- performance.

- c. Regulatory Requirements: Final interpretations of Code, regulatory requirements, safety requirements, or insurance requirements necessitate a change to due inability of the specified item to conform, and the proposed substitution can be approved.
 - d. Warranty: Manufacturer or fabricator cannot certify or warrant performance of specified item as required, and where the Contractor certifies that the proposed substitution will provide the required warranty.
 - e. Owner's Benefit: Acceptance of the proposed substitution is clearly in the Owner's best interest because of cost, quality, or other consideration. In requesting a substitution under this clause, the Contractor shall furnish substantiation of any such reason.
2. During the construction period, Contractor will be notified in writing of decision to accept or reject the Substitution Request by the Owner. Permission to make any substitution after award of Contract shall be effected by a Change Order.
 3. The Contractor shall accompany any request for substitution with such drawings, specifications, samples, manufacturer's literature, performance data, and other information necessary to describe and evaluate the proposed substitution completely as defined in Section 01_33_00 of the Technical Specifications. The burden of proof shall be on the Contractor.
 4. Redesign and Coordination: In making request for approval of substitute materials, the Contractor must represent that it has investigated the proposed product and, in its opinion, it is equal or equivalent in all respects to that specified. Also, Contractor will coordinate all trades including changes thereto as may be required, that it waives all claims for additional costs which subsequently.

1.05 REQUEST FOR INFORMATION

Add the following new Section 1.05 to General Provisions:

- A. If the Contractor determines that some portion of the drawings, specifications or other Contract Documents require clarification or interpretation by the Owner because of an apparent error, inconsistency, omission, or lack of clarity in the Contract, the Contractor shall promptly submit a Request For Information ("RFI") and, unless otherwise directed, shall not proceed with the affected Work until the Owner has responded to the RFI. The Contractor shall plan its work in an efficient manner so as to allow for timely responses to RFIs.
- B. RFIs shall only be submitted by the Contractor utilizing e-Builder as described in Section 01 31 50. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed by the Owner. In the RFI the Contractor shall set forth its own interpretation or

understanding of the requirement along with reasons why it reached such an understanding and any adjustments recommended to proceed with the Work.

- C. The Owner will review RFIs to determine whether they meet the requirements identified above in paragraph B to qualify as an RFI. If the Owner determines that the document is not an RFI it will be returned to the Contractor unreviewed as to content. When appropriate the Contractor may resubmit the RFI, with all required information and in the proper manner.
- D. The Owner shall respond in writing within five (5) calendar days to Contractor's RFI.
 - 1. At the request of the Owner, the Contractor shall prioritize its RFIs, identify a date by which the Contractor prefers the RFI be answered, and reasons for such priority.
 - 2. If the Contractor submits a RFI on an activity less than fourteen (14) days prior to the commencement of that activity, the Contractor shall not be entitled to any time extension or adjustment in Contract Price due to the time it takes the Owner to respond to the RFI provided that the Owner responds within five (5) days. No delay to the Contractor's work or damages to the Contractor shall be attributable to the failure by the Owner to respond to the RFI until five (5) days after the Owner's receipt of the RFI, and then only if the failure by the Owner to respond is unreasonable and affects the Contract completion date.
- E. The Owner's response to a RFI shall not be considered a change to the Contract requirements. To the extent the Contractor believes that the Owner's response to the RFI constitutes changed work impacting Contract Price or Contract Time, the Contractor shall submit a Contractor's Change Order Proposal.

1.06 DISQUALIFICATION OF BIDDERS

Add the following new Section 1.06 to City Supplemental Conditions:

- A. A bidder may be deemed not responsible and the proposal rejected by the City for any of the following:
 - 1. More than one proposal is submitted for the same project from a bidder under the same or different name;
 - 2. Evidence of collusion exists with any other bidder. Participants in collusion will be restricted from submitting further bids;
 - 3. A bidder is not pre-qualified for the work or to the full extent of the bid;
 - 4. An unsatisfactory performance record exists based on past or current work;

5. There is uncompleted work which might hinder or prevent the prompt completion of the work bid upon;
6. The bidder failed to settle bills for labor or materials on past or current Contracts;
7. The bidder has failed to complete a written public Contract or has been convicted of a crime arising from a previous public Contract;
8. The bidder is unable, financially or otherwise, to perform the work;
9. A bidder is not authorized to do business in the state of Washington;
10. Failure by the Contractor to properly review the project documents and/or site;
11. Bid Evaluation Submittals are not provided in the time specified;
12. Receipt of addenda is not acknowledged; or
13. There are any other reasons deemed proper by the City.
14. Contractor has altered in any form or fashion the City's bid proposal form

1.07 AWARD OF CONTRACT

Add the following new Section 1.07 to City Supplemental Conditions:

- A. The Owner reserves the right to Award, in any order or combination, such Additives, Deductives, or Alternates, as may be set forth in the Bid Forms.

1.08 MINIMUM EXPERIENCE REQUIREMENTS

Add the following new Section 1.08 to City Supplemental Conditions:

- A. The Bidder shall submit if required as part of its bid submittal package the necessary information on the Statement of Qualifications Form for the NETP Odor Control Bioscrubber to demonstrate compliance with the minimum experience requirements. The City reserves the right to request clarifying or additional information.
- B. The Statement of Qualifications Form for the NETP Odor Control Bioscrubber shall be completed in its entirety and submitted with the bid submittal package. **Failure to submit and meet the requirements shall be grounds for rejection of the bid. The City of Tacoma shall be the sole judge in determining if the prospective bidder meets the minimum experience requirements.**

1.09 UTILITY COORDINATION

Add the following new Section 1.09 to City Supplemental Conditions:

- A. The Contractor shall coordinate his/her work with all utilities and other organizations, which have their facilities within the project area. A Utility coordination meeting with all the utility organization shall be

coordinated. These may include but are not limited to

- B. The Contractor is responsible for location of private underground utilities within the private property which are not maintained by an outside utility company, and which are not located through the One Call Locators Service.

- 1. The Contractor shall provide and pay for private locator service to locate private utilities.

1.10 TRAFFIC CONTROL

Add the following new Section 1.10 to City Supplemental Conditions:

- A. All road closures, obstructions, or detours will require approval by the Owner. The Contractor must submit a written request 24-hours in advance of any planned work that will impact a roadway. There is no guarantee that such request will be granted.
- B. The design, construction, and maintenance of all detours, including traffic control, traffic control signage, and ADA access and pedestrian access is the sole responsibility of the Contractor. This includes detours both outside the limits of the project and within the limits of the project.
- C. For any road closures, obstructions, or detours, the Contractor shall submit a traffic control plan for approval by the Owner. The detour plan shall be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), state standard specifications, and these specifications.

PART 2 INSURANCE AND BONDS

2.01 CONTRACTOR'S LIABILITY INSURANCE

Delete this section and replace with the following:

Contractor shall obtain all insurance policies, coverages, and terms included in the City of Tacoma Insurance Requirements in Part V of the Contract Documents.

Owner as Additional Insured: All insurance coverages shall be endorsed to include the Owner and A/E as an additional insured for Work performed in accordance with the Contract Documents, and all insurance certificates shall evidence the Owner and A/E as an additional insured.

2.02 COVERAGE LIMITS

Delete this section and replace with the following:

Contractor shall obtain all insurance policies, coverages, and terms included in the City of Tacoma Insurance Requirements in Part V of the Contract Documents.

2.03 INSURANCE COVERAGE CERTIFICATES

Delete this section and replace with the following:

Contractor shall obtain all insurance policies, coverages, and terms included in the City of Tacoma Insurance Requirements in Part V of the Contract Documents.

2.04 PAYMENT AND PERFORMANCE BONDS

Replace the entire Section 2.04 with the following:

A Payment and a Performance Bond shall be obtained by the Contractor utilizing the forms entitled "Payment Bond to the City of Tacoma" and "Performance Bond to the City of Tacoma" as found at the front of the Contract Documents under Part I Bid Proposal and Contract Forms. Contractor shall provide a Payment and a Performance Bond, including power of attorney, for 100 percent of the amount of the Bid (including sales tax) per RCW 39.08, securing performance of work; all Contract obligations; materials, and payment of laborers, manufacturers, and subcontractors. Contractor shall include in its bid the bond costs required to complete the base work, accepted alternates, and sales tax.

In the event that the Contractor intends to have a subcontractor perform all or a portion of the project, the Contractor should consider requiring its own performance bond from the subcontractor to guarantee successful performance of this project component.

2.05 ADDITIONAL BOND SECURITY

Add Section 2.05 with the following City Supplemental Conditions:

The Contract amount is increased by 20% or more.

2.06 BUILDER'S RISK

Replace Article A of Section 2.06 with the following:

- A. Installation Floater Insurance: Contractor shall obtain all insurance policies, coverages, and terms included in the City of Tacoma Insurance Requirements in Part V of the Contract Documents.

Delete Articles B and C.

PART 3 TIME AND SCHEDULE

3.01 PROGRESS AND COMPLETION

Add the following Articles to Sections 3.01 of Time and Schedule

- A. Contract Time for this project shall be **180 Calendar Days** following the issuance of the Notice To Proceed.
- B. Time for Physical Completion shall be 30 Calendar Days following the issuance of Substantial Completion.
- C. All preliminary Shop Drawings shall be submitted within 7 Calendar Days following the issuance of the Notice To Proceed.

3.02 CONSTRUCTION SCHEDULE

Replace Article C Section 3.02 with the following City Supplemental Conditions:

- A. Owner comments on Progress Schedule: Owner shall return comments on the preliminary Progress Schedule to Contractor within 7 Days of receipt. Review by Owner of Contractor's schedule does not constitute an approval or acceptance of Contractor's construction means, methods, or sequencing, or its ability to complete the Work within the Contract Time. Contractor shall revise and resubmit its schedule, as necessary. Owner may withhold a portion of progress payments until a Progress Schedule has been submitted which meets the requirements of this section.

Replace Section 3.02.D with the following City Supplemental Conditions:

- B. Submit a revised Progress Schedule that includes a three (3) week ahead scheduled work with each pay application, or as directed by the City, indicating but not limited to:
1. Actual starts and finishes of activities and changes in slack or float, lags and leads for each item;
 2. Percent complete;
 3. Changes in network logic.

Content of each revised Progress Schedule shall be the same information required in Section 3.02.B above.

1. Problem areas; anticipated delay; and impact of these on Schedule.
2. Report corrective action taken, or proposed, and its effect.
3. Should actual progress fall more than one (1) week behind the progress identified in the Target Schedule, the Contractor shall explain the cause and will take the necessary steps to alter the construction schedule to comply with the Contract Completion date.

Payment will not be made until Progress Schedule revisions are up to date and accurate.

3.05 DELAY

Replace the entire Section 3.05 with the following City Supplemental Conditions:

- A. Avoidable delays in the prosecution or completion of the Work shall include all delays that might have been avoided by the exercise of care, prudence, foresight, or diligence on the part of the Contractor. Avoidable delays may include, but are not limited to:
1. Reasonable loss of time resulting from the necessity of submitting drawings to the City for acceptance,
 2. Collecting survey/field/analytical information,
 3. Site management and coordination,
 4. Measurements and inspections,
 5. Subcontractor management, and
 6. Such interruptions as may occur in the prosecution of the Work on account of the reasonable interference of other Contractor employed by the City, these delays, which may interrupt the prosecution of parts of the Work, while at the time

may be unavoidable but do not necessarily prevent or delay the prosecution of other parts of the Work, or prevent the completion of the whole Work within the time herein specified, will be deemed avoidable within the meaning of this Contract.

- B. Unavoidable delays in the prosecution of completion of the Work under this Contract shall include all delays which may result through causes beyond the control of the Contractor, and which he could not have provided against by the exercise of care, prudence, foresight, or diligence. Unavoidable delays shall hereinafter be referred to as "Force Majeure".

Force Majeure includes, but is not limited to:

1. Acts of God or the public enemy;
2. Acts or omissions of any government entity;
3. Fire or other casualty for which Contractor is not responsible;
4. Quarantine or epidemic;
5. Strike or defensive lockout;
6. Orders issued by the Owner, changing the amount of Work to be accomplished in excess of 25% per single change.
7. Failure of the Owner to provide rights-of-entry.

These delays shall be considered unavoidable so far as they necessarily interfere with the Contractor's completion of the whole Work.

- C. Whenever the Contractor foresees any delay in the prosecution of the Work, and in any event immediately upon the occurrence of any such delay, the Contractor shall submit a written notice to the City as provided in Section 7.02 of the General Conditions. The City may determine whether the delay is to be considered avoidable or unavoidable ("Force Majeure"), how long it continues, and to what extent the prosecution and completion of the Work are to be delayed thereby.

Contractor may be entitled to an equitable adjustment in the Contract Sum, if the cost or time of Contractor's performance is changed due to the fault or negligence of City, provided the Contractor makes a request according to sections 7.02 and 7.03.

After the completion of any part or the whole of the Work, the City, in approving the amount due the Contractor, will assume that any and all delays which have occurred in its prosecution and completion have been avoidable, except such delays as shall have been called to the attention of the City in writing as per Section 7.02 at the time of their occurrence, and later found by the City to have been unavoidable. The Contractor shall make no claims that any delay not called to the attention of the City, in writing, at the time of its occurrence has been an unavoidable delay ("Force Majeure").

- D. For delays which are unavoidable ("Force Majeure"), as determined

by the City, an extension of time beyond the time specified for completion will be allowed, within which to complete the Contract. The Contractor will not be charged, because of any extension of time for such unavoidable delay, any liquidated damages or engineering and related costs, as are charged in the case of avoidable delays. Contractors overhead cost associated with "Force Majeure" are excluded from equitable adjustment.

- E. If the Work called for under this Contract is not finished and completed by the Contractor, in all parts and in accordance with all requirements in the time specified, including extensions of time granted because of an unavoidable delay; the Contractor will be charged liquidated damages, or direct engineering and related costs as provided for in the Standard Specifications.

In addition, the City shall charge to the Contractor, and may deduct from the [mal payment for the Work, all engineering and related costs incurred by the City in connection with the Work during the period of such extension or extensions. The City shall make the final determination as to the appropriateness of charges required to complete the Work.

- F. The granting of any extension of time on account of delays, which in the judgment of the City are avoidable delays, shall in no way operate as a waiver on the part of the City of its rights under this Contract.

3.07 DAMAGES FOR FAILURE TO ACHIEVE TIMELY COMPLETION

Add Section 3.07.A to City Supplemental Conditions:

- A. Time is of the essence on the Contract. Delays inconvenience the City's daily operation and add undue time and cost required for administration, engineering, inspections, and supervision. Accordingly, the Contractor agrees:
 - 1. To Pay (according to the following formula) liquidated damages for each calendar day beyond the number of days established for milestone or substantial completion, and
 - 2. To authorize the City to deduct these liquidated damages from any money due or coming due to the Contractor.

LIQUIDATED DAMAGES FORMULA $LD = \frac{0.20C}{T}$

Where:

LD = liquidated damages per calendar day (rounded to nearest dollar)

C = original contract amount for Work Order

T = original time for milestone or substantial completion

- B. When the contract work has progressed to the extent that the City has full 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 to physically complete of the total contract, the City may determine the work is substantially complete. The City will notify the Contractor in writing of the substantial completion date. For overruns in contract time occurring after the date so established, the formula for liquidated damages as shown above will not apply. For overruns in contract time occurring after the substantial completion date, liquidated damages shall be assessed on the basis of direct engineering and related costs assignable to the project until actual final completion date of all the contract work. The Contractor shall complete the remaining work as promptly as possible.

3.08 SUSPENSION OF WORK

Add Section 3.08 to City Supplemental Conditions:

- A. The City may order suspension of all or any part of the work if:
 - 1. The Contractor does not comply with the contract or the City's orders.
- B. When ordered by the City to suspend or resume work, the Contractor shall do so immediately.
- C. If the work is suspended for reason (1) above, the period of work stoppage will be counted as calendar days maintaining the original contract completion requirement. The lost work time, however, shall not relieve the Contractor from any Contract responsibility.
- D. If the work is suspended for reason (2) above, the period of work stoppage will be counted as working days. The lost work time, however, shall not relieve the Contractor from any contract responsibility.
- E. If the performance of all or any part of the work is suspended, delayed, or interrupted for an unreasonable period of time by an act of the Contracting Agency in the administration of the Contract, or by failure to act within the time specified in the Contract (or if no time is specified), the City will make an adjustment for any increase in the cost or time for the performance of the Contract (excluding profit, overhead, home office expense, supervisory personnel labor not specifically assigned to the project) necessarily caused by the suspension, delay, or interruption. However, no adjustment will be made for any suspension, delay, or interruption if (1) the performance would have been suspended, delayed or interrupted by any other cause, including the fault or negligence of the Contractor, or (2) an equitable adjustment is provided for or excluded under any other provision of the Contract.
- F. If the Contractor believes that the performance of the work is suspended, delayed, or interrupted for an unreasonable period of time and such suspension, delay, or interruption is the responsibility of the Contracting Agency, the Contractor shall immediately submit a written request for equitable adjustment to the Engineer as provided in Section 7.02. No

adjustment shall be allowed for any costs incurred more than 7 calendar days before the date the Engineer receives the Contractor's written request for equitable adjustment. If the Contractor contends damages have been suffered as a result of such suspension, delay, or interruption, the protest shall not be allowed unless the request for equitable adjustment (stating the amount of damages) is asserted in writing within 14 calendar days of end of the delay. The Contractor shall keep full and complete records of the costs and additional time of such suspension, delay, or interruption and shall permit the Engineer to have access to those records and any other records as may be deemed necessary by the Engineer to assist in evaluating the protest.

- G. The City will determine if an equitable adjustment in cost or time is due as provided in this section. The equitable adjustment for increase in costs, if due, shall be subject to the limitations provided in Section 7.02, provided that no profit of any kind will be allowed on any increase in cost necessarily caused by the suspension, delay, or interruption.
- H. Request for extensions of time will be evaluated in accordance with Section 7.03.
- I. No claim by the Contractor under this clause shall be allowed unless the Contractor has followed the procedures provided in this Section and Sections 7.02 and 7.03.
- J. Contractor shall notify surety of all claims and provide evidence to Owner that surety has been advised.

3.09 MAINTENANCE DURING SUSPENSION

Add Section 3.09 with City Supplemental Conditions:

- A. Before and during any suspension (as described in Section 3.08) the Contractor shall protect the work from damage or deterioration. Suspension shall not relieve the Contractor from anything the Contract requires unless this section states otherwise.
- B. After any suspension, the Contractor shall retain all responsibilities the Contract assigns for repairing or restoring the construction area to the requirement of the plans.

3.10 EXECUTION OF CONTRACT – SCHEDULE

Add Section 3.10 to City Supplemental Conditions:

Copies of the Contract Provisions, including the unsigned Form of Contract, will be available for signature by the successful bidder on the first business day following award. The number of copies to be executed by the Contractor will be determined by the Contracting Agency.

Within 5 calendar days after the award date, the successful bidder shall return the signed Contracting Agency-prepared contract, an insurance certification and a satisfactory bond as required.

Until the Contracting Agency executes a contract, no proposal shall bind the Contracting Agency nor shall any work begin within the project limits or within Contracting Agency-furnished sites. The Contractor shall bear all risks for any work begun outside such areas and for any materials ordered before the contract is executed by the Contracting Agency.

If the bidder experiences circumstances beyond their control that prevents return of the contract documents within 5 calendar days after the award date stated above, the Contracting Agency may grant up to a maximum of 2 additional calendar days for return of the documents, provided the Contracting Agency deems the circumstances warrant it.

PART 4 SPECIFICATIONS, DRAWINGS, AND OTHER DOCUMENTS

4.03 SHOP DRAWINGS

Replace Section 4.03.E with City Supplemental Conditions:

- E. Contractor to submit Shop Drawings electronically: Unless otherwise provided in Division 1, Contractor shall submit to Owner for approval Shop Drawings electronically through e-Builder.*

Add Section 4.03.F with City Supplemental Conditions:

- F. The Contractor shall submit a submittal schedule with dates for Shop Drawings within 7 Calendar Days of issuance of Notice To Proceed.*

4.05 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS, AND OTHER DOCUMENTS

Add Section 4.05.E with City Supplemental Conditions:

- E. The Contractor may pick up, at their own cost, additional plans and specifications from ARC located at 632 Broadway, Tacoma, Washington 98402 or by going to <http://www.nwcontractorsnetwork.com>.*

PART 5 PERFORMANCE

5.02 PERMITS, FEES AND NOTICES

Add Section 5.02.A with City Supplemental Conditions:

- A. The actual cost of the general building permit shall be paid directly to the permitting agency by the City.*

5.04 PREVAILING WAGES

Add Section 5.04.H with City Supplemental Conditions:

- H. Copies of approved Intents to Pay Prevailing Wages for the Contractor and all subcontractors shall be submitted with the Contractor's first application for payment. As additional subcontractors perform work on the project, their approved Intent forms shall be submitted with the*

Contractor's next application for payment.

1. The Contractor and all subcontractors shall promptly submit to the City certified payroll copies if requested, with the second pay application.
2. The City of Tacoma reserves the right to withhold payment if the Contractor does not provide copies of Certified Payroll with each application of payment.

5.07 SAFETY PRECAUTIONS

Replace Section 5.07.A with City Supplemental Conditions:

- A. In performing this Contract, the Contractor shall provide for protecting the lives and health of employees and other persons; preventing damage to property, materials, supplies, and equipment; and avoid work interruptions. For these purposes, the Contractor shall:

Follow Washington Industrial Safety and Health Act (WISHA) regional directives and provide a site-specific safety program that will require an accident prevention and hazard analysis plan for the Contractor and each subcontractor on the work site. The Contractor shall submit a site-specific safety plan to the City's representative prior to the initial scheduled construction meeting.

- a. Provide adequate safety devices and measures including, but not limited to, the appropriate safety literature, notice, training, permits, placement and use of barricades, signs, signal lights, ladders, scaffolding, staging, runways, hoist, construction elevators, shoring, temporary lighting, grounded outlets, wiring, hazardous materials, vehicles, construction processes, and equipment required by Chapter 19.27 RCW, State Building Code (Uniform Building, Electrical, Mechanical, Fire, and Plumbing Codes); Chapter 212-12 WAC, Fire Marshal Standards, Chapter 49.17 RCW, WISHA; Chapter 296-155 WAC, Safety Standards for Construction Work; Chapter 296-65 WAC; WISHA Asbestos Standard; WAC 296-62-071, Respirator Standard; WAC 296-62, General Occupation Health Standards, WAC 296-24, General Safety and Health Standards, WAC 296-24, General Safety and Health Standards, Chapter 49.70 RCW, and Right to Know Act.
- b. Comply with the State Environmental Policy Act (SEPA), Clean Air Act, Shoreline Management Act, and other applicable federal, state, and local statutes and regulations dealing with the prevention of environmental pollution and the preservation of public natural resources.
- c. Post all permits, notices, and/or approvals in a conspicuous location at the construction site.
- d. Provide any additional measures that the City determines to be reasonable and necessary for ensuring a safe environment in areas open to the public. Nothing in this part shall be construed as

imposing a duty upon the City or A/E to prescribe safety conditions relating to employees, public, or agents of the Contractors.

- e. All construction personnel shall wear highly visible reflective vests and hardhats while on North End Wastewater Treatment Plant (NETP) property.

5.10 UNFORESEEN PHYSICAL CONDITIONS

Replace Section 5.10.A with City Supplemental Conditions:

A. Notice requirement for concealed or unknown conditions: If Contractor encounters conditions at the site which are subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then Contractor shall give written notice to Owner promptly and in no event later than 1 Day after the first observance of the conditions. Conditions shall not be disturbed prior to such notice.

5.15 TESTS AND INSPECTION

Replace Section 5.15.A and 5.15.B with City Supplemental Conditions:

- A. The City will enlist and pay for the services of a qualified testing agency to provide quality control, third party testing, and special inspection services as stated specifically in Division 01 and Technical Specifications of the Project Specifications. All other testing or inspecting shall be by Contractor's 3rd Party Agency and paid for by Contractor.
- B. Tests and Inspections shall include the following minimum requirements:
 - 1. Preparatory Inspection (pre-installation meetings): This shall be performed prior to beginning any work and shall include:
 - a. A review of applicable specifications;
 - b. A review of the Contract plans;
 - c. A check to assure that all materials and/or equipment have been tested, submitted and approved;
 - d. A check to assure that provisions have been made to provide control inspection and testing;
 - e. Examination of the work area to assure that all required preliminary work has been completed and is in Contract compliance;
 - f. A physical examination of required materials, equipment and sample work to assure that they conform to approved shop drawings or submitted data and are properly stored;
 - g. Discussion of procedures for constructing the work, including repetitive deficiencies, construction tolerances and workmanship standards specified in the documents.
 - 2. Initial Inspection: This shall be performed as soon as work begins on

- a definable feature of work and the following shall be accomplished:
 - a. A check of preliminary work to ensure that it is in Contract compliance and review of the preparatory meeting minutes;
 - b. Verification of full Contract compliance and verify that required control inspection and testing is underway;
 - c. Establish level of workmanship, verify that it meets minimum acceptable workmanship standards, and compare work with sample panels, etc., as appropriate;
 - d. Resolve all differences;
 - e. This inspection phase shall be repeated for each new crew on site performing the work, or any time standards are not being met.
- 3. Follow-Up Inspections: These follow up inspections shall be performed daily to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The City or City's representative may require joint Contractor inspections at any time and on a periodic basis to evaluate the effectiveness of the quality control system.
- 4. Tests: All operation and acceptance tests, where specified, are to be performed to verify control measures are adequate.
 - a. Costs for re-testing work that was previously tested but did not meet the requirements for the work shall be the responsibility of the Contractor.

5.20 SUBCONTRACTORS AND SUPPLIERS

Replace Section 5.20.B with City Supplemental Conditions:

- B. The Contractor shall submit the Request for Sublet Form provided by the City of Tacoma for every subcontractor used on the project prior to construction. Contractor shall not utilize any subcontractor or manufacturer to whom the City has a reasonable objection, and shall obtain City's written consent before making any substitutions or additions.

Add Section 5.20.F, 5.20.G, 5.20.H, 5.20.I with City Supplemental Conditions:

- F. The LEAP and EIC Programs have been adopted by the City to counteract economic and social ills, which accompany high rates of unemployment within the City of Tacoma.
 - 1. The Tacoma City Council established the LEAP Program for Public Works Contracts pursuant to City of Tacoma Ordinance No. 26301. The primary goal for this program is to provide an opportunity for City of Tacoma and Empowerment Zone/Enterprise Community residents to acquire skills, enter Apprenticeship Programs, and perform work that provides living wages.
 - 2. The Tacoma City Council established the EIC Program for Public Works Contracts pursuant to City of Tacoma Ordinance No. 28625. The primary goal for this program is to ensure equitable participation of historically under- utilized business enterprises, by establishing

goals for their utilization in public Contracting.

- G. The Contractor shall not subcontract work unless the City approves in writing. Each request to subcontract shall be on the form the City provides. The subcontractor shall be a licensed State of Washington Contractor and shall have a valid City of Tacoma business license. If the City requests, the Contractor shall provide proof that the subcontractor has the experience, ability, and equipment the work requires. The City will approve the request only if satisfied with the proposed subcontractor's record, equipment, experience, and ability. Approval to subcontract shall not:
 - a. Relieve the Contractor of any responsibility to carry out the Contract;
 - b. Relieve the Contractor of any obligations or liability under the Contract and the Contractor's bond;
 - c. Create any Contract between the Contracting Agency and the subcontractor; or
 - d. Convey to the subcontractor any rights against the Contracting Agency.
- H. The Contracting Agency will not consider the following as subcontracting:
 - a. Purchase of sand, gravel, crushed stone, crushed slag, batched concrete aggregates, ready mix concrete, off-site fabricated structural steel, other off-site fabricated items, and any other materials supplied by established and recognized commercial plants
- I. If City determines that any subcontractor is performing services in an unsatisfactory manner or is not completing the Work in accordance with the requirements of the Contract Documents or is otherwise undesirable or unacceptable, City will by written notice so notify Contractor. Contractor shall then take immediate steps to rectify and correct the situation. If City and Contractor mutually agree such actions are ineffective or infeasible, Contractor shall terminate such subcontractor. Subcontracting by subcontractors will be subject to the same regulations.

5.21 WARRANTY OF CONSTRUCTION

Add Section 5.21.D with City Supplemental Conditions:

D. Warranties shall commence upon issuance of Substantial Completion.

5.23 ADJACENT PROPERTIES AND FACILITIES

Add Section 5.23 with City Supplemental Conditions:

- A. Contractor shall be responsible for negotiations of any waivers or alternate arrangements required to enable transportation of materials to the site at the Contractor's expense. The Contractor shall provide City with any written agreements as a matter of record only.

- B. Maintain conditions of access road to site such that access is not hindered as the result of construction related deterioration.

PART 6 PAYMENTS AND COMPLETION

6.02 SCHEDULE OF VALUES

Add Section 6.02 with City Supplemental Conditions:

Subcontracted Work shall be paid to the Contractor on the basis of Contractor's actual cost of amounts properly paid to such subcontractors. A Schedule of Values shall be submitted for the Work of each subcontractor, as well as suppliers providing materials in excess of \$2,500.00. The total for all progress payments shall not exceed the Contract Sum, as may be adjusted by Change Orders. The General Contractor shall provide a schedule of values for Lump Sum bid items for review and acceptance.

The General Contractor shall be required to submit signed lien waivers by Corporate Office for all parties. The General Contractor shall submit the anticipated cash flow for the project and update monthly.

6.03 APPLICATION FOR PAYMENT

Replace Article B in Section 6.03 with the following City provision:

- B. Contractor certifies Subcontractors paid: By submitting an Application for Payment, Contractor is certifying that all Subcontractors have been paid, less earned retainage in accordance with RCW 60.28.011, as their interests appeared in the last preceding certificate of payment. By submitting an Application for Payment, Contractor is recertifying that the representations set forth in section 1.03 are true and correct, to the best of Contractor's knowledge, as of the date of the Application for Payment . Contractor shall submit application for payment on AIA form G702/G703, with modifications made for payment certification. Payment shall be certified by a corporate officer of the Contractor.

Replace Article D In Section 6.03 with the following City provision:

- D. Payment for material delivered to site or stored off-site: If authorized by Owner, the Application for Payment may include request for payment for material delivered to the Project site and suitably stored, or for completed preparatory work. No payment will be made for material stored at an alternate location. The Contractor shall comply with or furnish satisfactory evidence of the following:

Delete items 1 through 8 of Article D of Section 6.03 of Payments and Completion and replace with the following:

1. Contractor assumes total responsibility for stored materials: Contractor and its surety assume total responsibility for the stored materials; and

2. Title: Title to all Work and materials covered by an accepted and paid Application For Payment shall pass to the Owner at the time of such payment, free and clear of all liens, claims, security interest, and encumbrances. Passage of title shall not, however, (1) relieve Contractor from any of its duties and responsibilities for the Work or materials, (2) waive any rights of the Owner to insist on full compliance by Contractor with the Contract requirements, or (3) constitute acceptance of the Work or materials

6.04 PROGRESS PAYMENTS

Add Section 6.04.E with City Supplemental Conditions:

E. Taxes.

Unless otherwise required in this Specification, applicable federal, state, city and local taxes shall be included in the submittal as indicated below. The total cost to the City, including all applicable taxes, may be the basis for Contract award determination. As used herein, the term "taxes" shall include any and all taxes, assessments, fees, charges, interest, penalties, and/or fines imposed by applicable laws and regulations in connection with the procurement of goods and/or services hereunder.

1. Federal Excise Tax

The City of Tacoma is exempt from federal excise tax. The City will furnish a Federal Excise Tax Exemption certificate, if required. If the Respondent fails to include applicable tax in its submittal, then Respondent shall be solely responsible for the payment of said tax.

2. State and Local Sales Tax

The City of Tacoma is subject to Washington state sales tax. It is the Respondent's obligation to state the correct sales tax percentage and include the applicable Washington state, city, and local sales tax as a separate line item(s) in the submittal.

3. City of Tacoma Business and Occupation Tax

It is the Respondent's obligation to include City of Tacoma Business and Occupation tax in the unit and/or lump sum prices submitted; it shall not be shown separately on the submittal.

Per Sub-Title 6A of the City of Tacoma Municipal Code, transactions with the City of Tacoma may be subject to the City's Business and Occupation Tax.

It is the responsibility of the Respondent awarded the Contract to register with the City of Tacoma's Tax and License Division, 733 South Market Street, Room 21, Tacoma, WA 98402-3768, telephone (253) 591-5252, website <http://www.cityoftacoma.org/Page.aspx?nid+201>.

4. Any or All Other Taxes

Any or all other taxes are the responsibility of the Respondent unless otherwise required by law.

6.07 SUBSTANTIAL COMPLETION

Add Section 6.07.A with City Supplemental Conditions:

- A. The prerequisites for issuance of a Certificate of Substantial Completion by the City are as follows:
1. Submit the final progress payment showing 100% completion for the work being claimed as substantially complete. List any incomplete items of work along with their value and an explanation of why the work is incomplete.
 2. Coordinate with the City for changeover of all insurance coverage.
 3. Submit all warranties, guarantees, maintenance agreements, and workmanship/warranty bonds as required by the Contract Documents.
 4. Deliver all tools, spare parts, "Attic Stock" and other deliverables to the City as required by the Contract Documents.
 5. Submit Record Drawings as required by the Contract Documents
 6. Perform all work as required to obtain a Certificate of Occupancy.
 7. Punch List Procedures
 - i. Prior to Substantial Completion (approximately 10 working days) Contractor provide its own initial Punch List (List of Deficiencies) for the Owner's review. Owner and Engineer on Record shall review and make edits as they deem appropriate. The List of Deficiencies will be sent back to the Contractor for the Contractor to perform the work. The Contractor must complete the work in a satisfactorily manner before the Owner will accept.

6.09 FINAL COMPLETION, ACCEPTANCE, AND PAYMENT

Add Section 6.09.A with City Supplemental Conditions:

- A. Final Completion shall be the same as Physical Completion.

Add Section 6.09.D with City Supplemental Conditions:

D. Prerequisites for Final Acceptance

1. Obtain the City's written approval that all items on the List of Deficiencies as prepared by the Contractor have been completed.
2. Submit consent of Surety. Provide the standard form of the surety company or submit consent using the AIA Document G-707 form.
3. Submit all Record Drawings and Record Specifications.
4. Complete final clean up and repair of items damaged during construction.

5. Reinsertion Procedure

- i. Upon receipt of the Contractor's Notice that work on the List of Deficiencies has been completed, the City will visit the site to determine if the work has progressed to an acceptable level of quality justifying a final inspection. If Contractor's work is acceptable and complete the Owner shall issue written acceptance of corrections so stated on List of Deficiencies.

PART 7 **CHANGES**

7.01 CHANGE IN THE WORK

Replace Section 7.01.B with City Supplemental Conditions:

- B. If City desires to order a change in the Work, it may request a written Change Order proposal from Contractor. Contractor shall submit a Change Order proposal within 7 days of the request from City, or within such other period as mutually agreed. Contractor's Change Order proposal shall be full compensation for implementing the proposed change in the Work, including any adjustment in the Contract Sum or Contract Time, and including compensation for all delays in connection with such change in the Work and for any expense or inconvenience, disruption of schedule, or loss of efficiency or productivity occasioned by the change in the Work.

Replace Section 7.01.E with City Supplemental Conditions:

- E. Failure to agree upon terms of Change Order; Final offer and Claims: If Owner and Contractor are unable to reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, Contractor may at any time in writing, request a final offer from Owner. Owner shall provide Contractor with its written response within 14 Days of Contractor's request. Owner may also provide Contractor with a final offer at any time. If Contractor rejects Owner's final offer, or the parties are otherwise unable to reach agreement, Contractor's only remedy shall be to file a Claim as provided in Part 8.

Add Section 7.01.G with City Supplemental Conditions:

- G. Change Order Documentation
 1. A log will be maintained by the Contractor subject to review and comment by Owner for each of the documents identified in this section leading up to issuances of Change Order. These logs will record transmittals, suspense dates, review stopovers, dates of actions, and other specific pertinent information to track the progress of the subject documents. The Owner reserves the right to dispute any and all entries to which the Contractor shall include in said log.

2. The City reserves the right to include and exclude as many Requests for Proposals and or Change Order Proposals into one Change Order as the City determines is in its best interest.

7.02 CHANGE IN THE CONTRACT SUM

Replace Section 7.02.A.2(b) and (c) with City Supplemental Conditions:

- (b) Content of notice for equitable adjustment; Failure to comply: Contractor shall not be entitled to any adjustment in the Contract Sum for any occurrence of events or costs that occurred more than 2 Days before Contractor's written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the Contract Sum; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Sum requested. Failure to properly give such written notice shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.
- (c) Contractor to provide supplemental information: Within 3 Days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with subparagraph a. above with additional supporting data. Such additional data shall include, at a minimum: the amount of compensation requested, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the damages claimed, but that the damages claimed were actually a result of the act, event, or condition complained of and that the Contract Documents provide entitlement to an equitable adjustment to Contractor for such act, event, or condition; and documentation sufficiently detailed to permit an informed analysis of the request by Owner. When the request for compensation relates to a delay, or other change in Contract Time, Contractor shall demonstrate the impact on the critical path, in accordance with Section 7.03C. Failure to provide such additional information and documentation within the time allowed or within the format required shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.

Replace Section 7.02.B.4 with City Supplemental Condition:

4. Markups on additive and deductive Work: The cost of any additive or deductive changes in the Work shall be calculated as set forth below, except that overhead and profit shall not be included on deductive changes in the Work unless deductive change exceeds \$10,000. Where a change in the Work involves additive or deductive Work by

the same Contractor or Subcontractor, small tools, overhead, profit, bond and insurance markups will apply to the net difference.

Replace Section 7.02.B.7.a(1) with City Supplemental Conditions:

1. Basic wages and benefits: Hourly rates and benefits as stated on the Department of Labor and Industries approved "statement of intent to pay prevailing wages" or a higher amount if approved by the City only if supported by certified payrolls. Direct supervision shall be a reasonable percentage not to exceed 10% of the cost of direct labor. No supervision markup shall be allowed for a working supervisor's hours.

Delete Section 7.02.B.7.a(4) in its entirety.

Replace Section 7.02.B.7.d with City Supplemental Conditions:

- d. Allowance for small tools, expendables & consumable supplies: Small tools consist of tools which cost \$250 or less and are normally furnished by the performing contractor. The maximum rate for small tools shall not exceed the following:
 1. 1% for Contractor: For Contractor, 1% of direct labor costs.
 2. 2% for Subcontractors: For Subcontractor, 2% if direct labor costs.

Expendables and consumables supplies directly associated with the change in Work must be itemized.

Replace Section 7.02.B.7.f(1)(a) with City Supplemental Conditions, Projects less than \$3 million:

- a. Contractor markup on Contractor Work for Overhead: For Contractor, for any Work actually performed by Contractor's own forces, 10% of the first \$50,000 of the cost, and 4% of the remaining cost, if any.

Replace Section 7.02.B.7.f(1)(b) with City Supplemental Conditions, Projects less than \$3 million:

- b. Subcontractor markup for Subcontractor Work for Overhead: For each Subcontractor (including lower tier subcontractors), for any Work actually performed by its own forces, 12% of the first \$50,000 of the cost, and 4% of the remaining cost, if any.

Replace Section 7.02.B.7.f(1)(c) with City Supplemental Conditions, Projects less than \$3 million:

- c. Contractor markup for Subcontractor Work: For Contractor, for any work performed by its Subcontractor(s) 6% of the first

\$50,000 of the amount due each Subcontractor, and 4% of the remaining amount, if any.

Replace Section 7.02.B.7.f(1)(d) with City Supplemental Conditions, Projects less than \$3 million:

- d. Subcontractor markup for lower tier Subcontractor Work: For each Subcontractor, for any Work performed by its Subcontractor(s) of any lower tier, 4% of the first \$50,000 of the amount due the sub- Subcontractor, and 2% of the remaining amount if any.

Replace Section 7.02.B.7.f(1)(e) with City Supplemental Conditions, Projects less than \$3 million:

- e. Basis of cost applicable for markup: The cost to which overhead is to be applied shall be developed in accordance with Section 7.02B 7a. – e.

Replace Section 7.02.B.7.g(1) with City Supplemental Conditions:

1. Contractor / Subcontractor markup for self-performed Work for Profit: For Contractor or Subcontractor of any tier for work performed by their forces, 5% of the cost developed in accordance with Section 7.02B 7a.-e.

Replace Section 7.02.B.7.g(2) with City Supplemental Conditions:

2. Contractor / Subcontractor markup for Work performed at lower tier for Profit: For Contractor or Subcontractor of any tier for work performed by a subcontractor of a lower tier, 5% of the subcontract cost developed in accordance with Section 7.02.B.7.a–h.

Replace Section 7.02.B.7.h(1) with City Supplemental Conditions:

1. Contractor's liability insurance: The cost of any changes in Contractor's liability insurance arising directly from execution of the Change Order shall not exceed 1%; and

Replace Section 7.02.B.7.h(2) with City Supplemental Conditions:

2. Payment and Performance Bond: The cost of the additional premium for Contractor's bond arising directly from the changed Work shall not exceed 1.5%.

Add Section 7.02C, with City Supplemental Conditions:

All mark-ups per Section 7.02.B.7.f

Add Section 7.02.D.4 with City Supplemental Conditions:

4. Subcontractor and sub-subcontractor proposals to the Contractor for time and material Work shall include all direct costs plus overhead, profit, taxes, bond, and insurance costs, calculated as provided in Section 7.02B.

7.03 CHANGE IN THE CONTRACT TIME

Replace Section 7.03.B.2 with City Supplemental Conditions:

2. Timing and content of Contractor's Notice: Contractor shall not be entitled to an adjustment in the Contract Time for any events that occurred more than 2 Days before Contractor's written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the Contract Time; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Time requested. Failure to properly give such written notice shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.

Replace Section 7.03.B.3 with City Supplemental Conditions:

3. Contractor to provide supplemental information: Within 3 days of the occurrence of the event giving rise to the request, unless city agrees in writing to allow an additional period of time to ascertain more accurate data, contractor shall supplement the written notice provided in accordance with subparagraph 7.03.B.2 with additional supporting data. such additional data shall include, at a minimum: the amount of delay claimed, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that contractor suffered the delay claimed, but that the delay claimed was actually a result of the act, event, or condition complained of, and that the contract documents provide entitlement to an equitable adjustment in contract time for such act, event, or condition; and supporting documentation sufficiently detailed to permit an informed analysis of the request by City. Failure to provide such additional information and documentation within the time allowed or within the format required shall, to the extent city's interests are prejudiced, constitute a waiver of contractor's right to an equitable adjustment.

Replace Section 7.03.D.4.a with City Supplemental Conditions:

- a. Non-productive supervision or labor: cost of Contractor and its crews specifically assigned to the project.

Home office cost is not allowed.

Delete section 7.03.D.4.b in its entirety.

Replace Section 7.03.D.4.c with City Supplemental Conditions:

- c. Temporary facilities or equipment rental: cost of temporary facilities or equipment rental extended because of the delay, at invoiced cost, no mark-ups allowed.

Replace Section 7.03.D.4.d with City Supplemental Conditions:

- d. Insurance premiums: cost of insurance by invoice extended because of the delay

Replace Section 7.03.D.e with City Supplemental Conditions:

- e. Overhead: general and administrative overhead in an amount to be agreed upon, but not to exceed 1% of the Contract Award Amount divided by the originally specified Contract Time for each Day of the delay.

Add Section 7.03.E with City Supplemental Conditions:

E. Notwithstanding any other provision of the Contract Documents, no claim by the Contractor for an equitable adjustment hereunder will be allowed if not asserted within seven (7) days of discovery.

7.04 DELETED OR TERMINATED WORK

Add the following new Section 7.04 with City Supplemental Conditions:

- A. If the Agreement is terminated for convenience in accordance with Section 9.02, or as modified or if any item of Work is deleted in whole or in part, payment will be made for partially completed items mutually agreed or as determined by the City in the proportion that the partially completed Work is to the total item. No claim for damages of any kind or for loss of anticipated profits on deleted or uncompleted work will be allowed because of the termination or deductive Change Order.
- B. If the Agreement is terminated for convenience or parts of the Work are deleted, the Contract Time shall be adjusted as the Parties agree. If the Parties cannot agree, the City shall determine the equitable adjustment for Contract Time.
- C. Acceptable materials ordered by the Contractor or delivered on the Work prior to the date the Work was terminated or deleted by the City, will either be purchased from the Contractor by the City at the actual cost and shall become the property of the City, or the City will reimburse the Contractor for the actual costs connected with returning these materials to the Manufacturers.
- D. If Agreement is terminated prior to the Notice to Proceed, no cost will be incurred by either party.

PART 8 CLAIMS AND DISPUTE RESOLUTION

8.01 CLAIMS PROCEDURE

Replace Section 8.01.B with City Supplemental Conditions:

- B. Claim filing deadline for Contractor: Contractor shall file its Claim within 15 days from Owner's final offer made in accordance with paragraph 7.01E, or by the date of Substantial Completion, whichever occurs first.

Replace Section 8.01.C.6 with City Supplemental Conditions:

6. Copies of supporting documentation: Copies of any identified documents, inclusive of the Contract Documents, that support the Claim;

Replace Section 8.01.D.1 and 8.01.D.2 with City Supplemental Conditions:

1. Response time for Claim less than \$50,000: If the Claim amount is less than \$50,000, with a decision within 30 Days from the date the Claim is received; or
2. Response time for Claims of \$50,000 or more: If the Claim amount is \$50,000 or more, with a decision within 45 Days from the date the Claim is received, or with notice to Contractor of the date by which it will render its decision. City will then respond with a written decision in such additional time.

Add the following Section 8.01.G with City Supplemental Conditions:

- G. Contractor shall fully investigate its subcontractor's claims and process said claim(s) as Contractor's Claim. Any and all claims which do not meet notification requirements shall be considered null and void.

8.02 ARBITRATION

Replace Section 8.02.B with City Supplemental Conditions:

- B. Filing of Notice of arbitration: Notice of the demand for arbitration shall be filed with the American Arbitration Association (AAA), in the state where project is located, with a copy provided to the City. The parties shall negotiate or mediate under the Voluntary Construction Mediation Rules of AAA, or mutually acceptable service, before seeking arbitration in accordance with the Construction Industry Arbitration Rules of AAA as follows:

1. Claims for less than \$30,000: Disputes involving \$30,000 or less shall be conducted in accordance with the Northwest Region Expedited Commercial Arbitration Rules; or

2. Claims greater than \$30,000: Disputes over \$30,000 shall be conducted in accordance with the Construction Industry Arbitration Rules of AAA, unless the parties agree to use the expedited rules.

8.03 CLAIMS AUDIT

Add Section 8.03.B with City Supplemental Conditions:

25. Schedules
26. Expediting Records and Information
27. Privilege documentation shall be allowed for all Claims of \$500,000 and over.

8.04 AUDIT

Add the following new Section 8.04.A with City Supplemental Conditions:

- A. At such times as City deems necessary for reasonable cause, Contractor shall permit the City to inspect and audit all pertinent books and records of the Contractor and its subcontractors or other persons or entities that have performed work in connection with or related to the Contractor's Work under this Agreement. The audit may take place up to three years after Completion. The books and records are to be made available at reasonable times in Pierce County, Washington, or at such other reasonable location as City selects. At City's request, Contractor shall supply City with, or shall permit City to make a copy of, any books and records and any portion thereof. Contractor shall ensure that such inspection, audit and copying right is a condition of any Subcontract, agreement or other arrangement under which any person or entity is permitted to perform work in connection with or related to the Work under this Agreement. Any failure of the Contractor to incorporate contract requirements shall be at the expense of the Contractor.

PART 9 TERMINATION OF THE WORK

9.01 TERMINATION BY CITY FOR CAUSE

Add the following Articles to Section 9.01 with City Supplemental Conditions:

- H. If the Contractor defaults, fails, or neglects to carry out the Work in accordance with the Contract Documents, the City may give written notice to cure the problem within seven (7) days. If the problem is not cured or the City determines the effort for correction is inadequate within this time, the City may give a second notice to cure within seven (7) days. If the problem is not cured within this time, the City may issue a notice to terminate for cause, which shall be effective immediately upon issuance.
- I. The City rights to the site are subject to the rights and duties of the surety, if any, that may be obligated under any bond provided in accordance with the Contract Documents.

- J. In a termination situation, the City reserves the right to use any subcontractor, material Manufacturer, fabricator, or any vendor originally contracted by the Contractor or to assign their Contract with the Contractor to the City. The cost of completing the work shall include additional management, design services, legal fees, and other associated costs to complete the project as scheduled.
- K. The Contractor will be terminated for cause if any employee, agent, or representative of the Contractor gives, or offers to give, any gratuity such as a gift or entertainment to an official, employee, officer, or agent of the City.

9.02 TERMINATION BY CITY FOR CONVENIENCE

Add Section 9.02.C with City Supplemental Conditions:

- C. This Contract may be terminated by the City upon fourteen (14) days written notice to the Contractor in the event the City determines it is in the best interest of the City to terminate this project. If such termination occurs, cost incurred by the Contractor for any bid/proposal preparation prior to award of contract is the sole responsibility of the Contractor. The City shall only pay the Contractor for work completed and materials or equipment delivered after Notice to Proceed as previously approved by the City.

PART 10 MISCELLANEOUS PROVISIONS

No provisions were made by the City of Tacoma.

END OF SUPPLEMENTAL CONDITIONS

PART V

CITY OF TACOMA – INSURANCE REQUIREMENTS



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

The Contractor (Contractor) shall maintain at least the minimum insurance set forth below. By requiring such minimum insurance, the City of Tacoma shall not be deemed or construed to have assessed the risk that may be applicable to Contractor under this Contract. Contractor shall assess its own risks and, if it deems appropriate and/or prudent, maintain greater limits and/or broader coverage.

1. GENERAL REQUIREMENTS

The following General Requirements apply to Contractor and to Subcontractor(s) of every tier performing services and/or activities pursuant to the terms of this Contract. Contractor acknowledges and agrees to the following insurance requirements applicable to Contractor and Contractor's Subcontractor(s):

- 1.1. City of Tacoma reserves the right to approve or reject the insurance provided based upon the insurer, terms and coverage, the Certificate of Insurance, and/or endorsements.
- 1.2. Contractor shall not begin work under the Contract until the required insurance has been obtained and approved by City of Tacoma.
- 1.3. Contractor shall keep this insurance in force during the entire term of the Contract and for Thirty (30) calendar days after completion of all work required by the Contract, unless otherwise provided herein.
- 1.4. Insurance policies required under this Contract that name "City of Tacoma" as Additional Insured shall:
 - 1.4.1. Be considered primary and non-contributory for all claims.
 - 1.4.2. Contain a "Separation of Insured provision and a "Waiver of Subrogation" clause in favor of City of Tacoma.
- 1.5. Section 1.4 above does not apply to contracts for purchasing supplies only.
- 1.6. Verification of coverage shall include:
 - 1.6.1. An ACORD certificate or equivalent.
 - 1.6.2. Copies of all endorsements naming the City of Tacoma as additional insured and showing the policy number.
 - 1.6.3. A notation of coverage enhancements on the Certificate of Insurance shall not satisfy these requirements – actual endorsements must be submitted.
- 1.7. Liability insurance policies, with the exception of Professional Liability and Workers' Compensation, shall name the City of Tacoma and its officers, elected officials, employees, agents, and authorized volunteers as additional insured.
 - 1.7.1. No specific person or department should be identified as the additional insured.
 - 1.7.2. All references on certificates of insurance and endorsements shall be listed as "City of Tacoma".
 - 1.7.3. The City of Tacoma shall be additional insured for both ongoing and completed operations using Insurance Services Office (ISO) form CG 20 10 04 13 and CG 20



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

37 04 13 or the equivalent for the full available limits of liability maintained by the Contractor irrespective of whether such limits maintained by the Contractor are greater than those required by this Contract and irrespective of whether the Certificate of Insurance describes limits lower than those maintained by the Contractor.

- 1.8. Contractor shall provide a Certificate of Insurance for each policy of insurance meeting the requirements set forth herein when Contractor provides the signed Contract for the work to City of Tacoma. Contractor shall provide copies of any applicable Additional Insured, Waiver of Subrogation, and Primary and Non-contributory endorsements. Contract or Permit number and the City Department must be shown on the Certificate of Insurance.
- 1.9. Insurance limits shown below may be written with an excess policy that follows the form of an underlying primary liability policy or an excess policy providing the required limit.
- 1.10. Liability insurance policies shall be written on an "occurrence" form, except for Professional Liability/Errors and Omissions, Pollution Liability, and Cyber/Privacy and Security
- 1.11. If coverage is approved and purchased on a "Claims-Made" basis, Contractor warrants continuation of coverage, either through policy renewals or by the purchase of an extended reporting period endorsement as set forth below.
- 1.12. The insurance must be written by companies licensed or authorized in the State of Washington pursuant to RCW 48 with an (A-) VII or higher in the A.M. Best's Key Rating Guide www.ambest.com.
- 1.13. Contractor shall provide City of Tacoma notice of any cancellation or non-renewal of this required insurance within Thirty (30) calendar days.
- 1.14. Contractor shall not allow any insurance to be cancelled or lapse during any term of this Contract, otherwise it shall constitute a material breach of the Contract, upon which City of Tacoma may, after giving Five (5) business day notice to 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 City of Tacoma by Contractor upon demand, or at the sole discretion of City of Tacoma, offset against funds due Contractor from City of Tacoma.
- 1.15. Contractor shall be responsible for the payment of all premiums, deductibles and self-insured retentions, and shall indemnify and hold the City of Tacoma harmless to the extent such a deductible or self-insured retained limit may apply to the City of Tacoma as an additional insured. Any deductible or self-insured retained limits in excess of Twenty Five Thousand Dollars (\$25,000) must be disclosed and approved by City of Tacoma Risk Manager and shown on the Certificate of Insurance.
- 1.16. City of Tacoma reserves the right to review insurance requirements during any term of the Contract and to require that Contractor make reasonable adjustments when the scope of services has changed.



CITY OF TACOMA INSURANCE REQUIREMENTS FOR CONTRACTS

- 1.17. All costs for insurance shall be incidental to and included in the unit or lump sum prices of the Contract and no additional payment will be made by City of Tacoma to Contractor.
- 1.18. Insurance coverages specified in this Contract are not intended and will not be interpreted to limit the responsibility or liability of Contractor or Subcontractor(s).
- 1.19. Failure by City of Tacoma to identify a deficiency in the insurance documentation provided by Contractor or failure of City of Tacoma to demand verification of coverage or compliance by Contractor with these insurance requirements shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- 1.20. If Contractor is a State of Washington or local government and is self-insured for any of the above insurance requirements, a certification of self-insurance shall be attached hereto and be incorporated by reference and shall constitute compliance with this Section.

2. CONTRACTOR

As used herein, "Contractor" shall be the Supplier(s) entering a Contract with City of Tacoma, whether designated as a Supplier, Contractor, Vendor, Proposer, Bidder, Respondent, Seller, Merchant, Service Provider, or otherwise.

3. SUBCONTRACTORS

It is Contractor's responsibility to ensure that each subcontractor obtain and maintain adequate liability insurance coverage. Contractor shall provide evidence of such insurance upon City of Tacoma's request.

4. REQUIRED INSURANCE AND LIMITS

The insurance policies shall provide the minimum coverages and limits set forth below. Providing coverage in these stated minimum limits shall not be construed to relieve Contractor from liability in excess of such limits.

4.1 Commercial General Liability Insurance

Contractor shall maintain Commercial General Liability Insurance policy with limits not less than One Million Dollars (\$1,000,000) each occurrence and Two Million Dollars (\$2,000,000) annual aggregate. The Commercial General Liability Insurance policy shall be written on an Insurance Services Office form CG 00 01 04 13 or its equivalent. Products and Completed Operations shall be maintained for a period of three years following Substantial Completion of the Work related to performing construction services.

This policy shall include product liability especially when a Contract solely is for purchasing supplies. The Commercial General Liability policy shall be endorsed to include:

- 4.1.1 A per project aggregate policy limit, using ISO form CG 25 03 05 09 or an equivalent endorsement.

4.2 Workers' Compensation

- 4.2.1 Contractor shall comply with Workers' Compensation coverage as required by the



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

Industrial Insurance laws of the State of Washington, as well as any other similar coverage required for this work by applicable federal laws of other states. The Contractor must comply with their domicile State Industrial Insurance laws if it is outside the State of Washington.

4.3 Employers' Liability Insurance

Contractor shall maintain Employers' Liability coverage with limits not less than One Million Dollars (\$1,000,000) each employee, One Million Dollars (\$1,000,000) each accident, and One Million Dollars (\$1,000,000) policy limit.

4.4 Professional Liability Insurance or Errors and Omissions

Contractor and/or its subcontractor shall maintain Professional Liability or Errors and Omissions with limits of One Million Dollars (\$1,000,000) per claim and Two Million Dollars (\$2,000,000) in the aggregate covering acts, errors and omissions arising out of the professional services under this Contract.

If the policy limit includes the payment of claims or defense costs, from the policy limit, the per claim limit shall be Two Million Dollars (\$2,000,000).

If the scope of such design-related professional services includes work related to pollution conditions, the Professional Liability policy shall include Pollution Liability coverage.

If provided on a "claims-made" basis, such coverage shall be maintained by policy renewals or an extended reporting period endorsement for not less than three years following the end of the Contract.

4.5 Excess or Umbrella Liability Insurance

Contractor shall provide Excess or Umbrella Liability Insurance with limits not less than Three Million Dollars (\$3,000,000) per occurrence and in the aggregate. This coverage shall apply, at a minimum, in excess of primary underlying Commercial General Liability, Employer's Liability, Pollution Liability, Marine General Liability, Protection and Indemnity, and Automobile Liability if required herein.

4.6 Pollution Liability Insurance

Contractor shall maintain a Pollution Liability or Environmental Liability Insurance providing coverage, including investigation and defense costs, for bodily injury and property damage, including loss of use of damaged property or of property that has been physically damaged or destroyed.

Such coverage shall provide both on-site and off-site cleanup costs and cover gradual and sudden pollution, and include in its scope of coverage the City of Tacoma damage claims for loss arising out of Contractor's work with limits not less than One Million Dollars (\$1,000,000) each occurrence and Two Million Dollars (\$2,000,000) aggregate.

This policy shall include Environmental Resource Damage coverage and Hazardous Substance Removal. If such coverage is provided on a "claims-made" basis, the following additional conditions must be met:

4.6.1 The policy must contain no retroactive date, or the retroactive date must precede the commencement date of this Contract.

4.6.2 The extended reporting period (tail) must be purchased to cover a minimum of Six (6) years beyond completion of work.

4.7 Installation Floater Insurance

Contractor shall maintain during the term of the Contract, at its own expense, Installation Floater Insurance covering Contractor's labor, materials, and equipment to be used for completion of the work performed under this Contract against all risks of direct physical loss, excluding earthquake and flood, for an amount equal to the full amount of the Contract improvements.



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4.8 Inland Marine (Cargo) Insurance

Contractor shall maintain Cargo Insurance. Coverage shall protect the property from all risk of injury, and coverage shall be in an amount of the full replacement cost of the property, with no coinsurance exposure. Any applicable deductible shall not exceed Five Thousand Dollars (\$5,000).

4.9 Other Insurance

Other insurance may be deemed appropriate to cover risks and exposures related to the scope of work or changes to the scope of work required by City of Tacoma. The costs of such necessary and appropriate Insurance coverage shall be borne by Contractor.

P A R T V I

TECHNICAL SPECIFICATIONS

CITY OF TACOMA

SPECIFICATION NO. ES22-0060F

NORTH END WASTEWATER TREATMENT PLANT ODOR CONTROL
BIOSCRUBBER

TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01 11 00	Summary of Work
01 12 00	Work Sequence
01 14 00	Work Restrictions
01 25 00	Odor Control Bioscrubber Manufacturer Substitutions and Alternates
01 29 77	Applications for Payment
01 31 13	Project Management and Coordination
01 31 50	Web Based Construction Management
01 32 00	Construction Progress Documentation
01 33 00	Submittal & RFI Procedures
	Supplements:
	Submittal Transmittal Form 01300-A
01 35 00	Health and Safety
01 35 44	Hazardous Material Procedures
01 42 00	References
01 43 33	Manufacturer's Field Services
	Supplement:
	Manufacturer's Certificate of Proper Installation
01 45 33	Special Inspection, Observation, and Testing
	Supplement:
	Contractor's Statement of Responsibility.
01 50 00	Temporary Facilities and Controls
01 61 00	Common Product Requirements
01 73 00	Cutting and Patching
01 74 00	Cleaning
01 74 10	Construction Waste Management
01 77 00	Closeout Procedures
01 78 23	Operation and Maintenance Data
	Supplement:
	Maintenance Summary Form
01 91 14	Equipment Testing and Facility Startup
	Supplements:
	Equipment Test Report Form
	Unit Process Startup Form
	Facility Performance Demonstration/Certification Form
	Startup and Commissioning Checklist and Approval Sheet

DIVISION 2 – EXISTING CONDITIONS

02 41 00	Demolition
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DIVISION 3 THROUGH 22 (NOT USED)

DIVISION 23 – HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

23 31 16.16 Thermoset Fiberglass Reinforced Plastic Ducts

DIVISION 24 THROUGH 25 (NOT USED)

DIVISION 26 - ELECTRICAL

26 05 00.01 Common Work Results for Electrical for Small Projects

DIVISION 27 THROUGH 30 (NOT USED)

DIVISION 31 – EARTHWORK

31 41 00 Shoring

DIVISION 32 THROUGH 42 (NOT USED)

**DIVISION 43 - PROCESS GAS AND LIQUID HANDLING, PURIFICATION,
AND STORAGE EQUIPMENT**

43 11 19.13 Centrifugal FRP Fans

DIVISION 44 - POLLUTION AND WASTE CONTROL EQUIPMENT

44 31 21 Bioscrubber Odor Control Equipment

DIVISIONS 45 THROUGH 48 (NOT USED)

DIVISION 1

GENERAL REQUIREMENTS

<u>Number</u>	<u>Title</u>
01 11 00	Summary of Work
01 12 00	Work Sequence
01 14 00	Work Restrictions
01 25 00	Odor Control Bioscrubber Manufacturer Substitutions and Alternates
01 29 77	Applications for Payment
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01 74 00	Cleaning
01 74 10	Construction Waste Management
01 77 00	Closeout Procedures
01 78 23	Operation and Maintenance Data
	Supplement:
	Maintenance Summary Form
01 91 14	Equipment Testing and Facility Startup
	Supplements:
	Equipment Test Report Form
	Unit Process Startup Form
	Facility Performance Demonstration/Certification Form
	Startup and Commissioning Checklist and Approval Sheet

**SECTION 01 11 00
SUMMARY OF WORK**

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.
- B. Where indicated and referenced in the Contract, the cited paragraphs and standards of the Washington State Department of Transportation and American Public Works Association Standard Specifications, latest edition shall apply.

1.02 SUMMARY

- A. General work included in this section:
 - 1. Furnish all labor, materials, and equipment required in accordance with provisions of the Contract.
 - 2. Completely coordinate with work of all other trades.
 - 3. Although such work may not be specifically indicated, furnish and install all miscellaneous items incidental to or necessary.
- B. The Owner operates and maintains the North End Wastewater Treatment Plant (NETP) that provides wastewater treatment for residential and commercial customers. Plan the Work to allow Owner, Owner's agents, Engineer, suppliers, and other contractors to access these facilities and coordinate the Work so as to minimize impact on the operation of the facilities.

1.03 CONTRACTOR'S WORK AND RESPONSIBILITIES—GENERAL

- A. The Work includes but is not limited to the furnishing of the labor, supervision, equipment, materials and incidentals necessary to perform all work associated with the Odor Control Bioscrubber at the NETP as indicated in the Contract.
 - 1. General:
 - a. Coordinate work with facility staff prior to initiating work.
 - b. Verify dimensions affecting the work.
 - c. Provide shop drawings for all fabrication and construction for Owner review.
 - d. All bracing and shoring shall not be removed until all final connections have been completed in accordance with the drawings and materials have achieved design strength.

1.04 OWNER OCCUPANCY

- A. Contractor shall coordinate with Owner in all construction operations to minimize conflicts and to facilitate Owner usage.

1.05 CONTRACTOR USE OF PREMISES

- A. General: The contractor shall limit their use of the premises to the work indicated.
 - 1. Use of the Site: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction. The Contractor shall submit prior to commencing construction a Site Utilization Plan to address the requirements outline below. The Site Utilization Plan shall be submitted as required in Section 01 33 00 - Submittal & RFI Procedures.
 - a. Keep existing driveways and entrances serving the premises clear and available to the Owner and their employees / contractors / visitors and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - b. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain and pay for such storage off-site.
 - c. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave vehicles or equipment unattended with the motor running or the ignition key in place.
- B. Contractor and their subcontractors, agents, and vendors shall have visible tag identification displayed while on-site to identify them.
- C. See Section 01 14 00 "Work Restrictions" for additional information.

1.06 MISCELLANEOUS PROVISIONS

- A. Stored Products
 - 1. Contractor will assume full responsibility for the protection and safekeeping of products under this Contract, stored on and off the site.
 - 2. Contractor will move any stored products, under Contractor's control, interfering with operations of the Owner or separate Contractor.
 - 3. Contractor will obtain and pay for the use of additional storage or work areas needed for operations at no additional cost(s) to the Owner.
- B. Existing Utilities
 - 1. Exercise reasonable care to prevent damage to existing utilities. At Contractor's expense, immediately repair, restore, or relocate utilities damaged by performance of Contract Work. Contractor shall not leave site until repairs have been accomplished.

- C. Objections to Application of Products
 - 1. All Contractors and subcontractors submitting bids for this project shall thoroughly familiarize themselves with specified products and installation procedures and submit to Owner any objections (in writing) no later than seven (7) days prior to the Bid opening. Submittal of Bid constitutes acceptance of products and procedures specified within the Documents.
- D. Conflicts and Omissions in Drawings and Specifications
 - 1. The Contractor shall immediately bring to Owner's attention any conflicts and omissions between the Drawings and Specifications and between the Drawings or Specifications and actual site conditions. The Contractor shall be familiar with the site and conditions thereon. Corrections in conflicts may be included within the addenda which form an integral part of the Contract Documents.
- E. Subcontractor Instructions:
 - 1. The General Contractor shall incorporate requirements of Division 0, Division 1 and the work of Sections related to their own work into the subcontractor's contract. Instruct them that Division 0 and Division 1 conditions and requirements apply to their work in each Section of the technical specifications.

1.07 UTILITIES

- A. Existing Utilities
 - 1. Contractor shall exercise reasonable care to prevent damage to existing utilities. At Contractor's expense, contact utility companies if damage to utility is known, if not known immediately repair, restore or relocate utilities damaged during construction. Contractor shall not leave site until repairs have been accomplished.
- B. Coordination of Utility Service Requirements: Coordinate all utility service requirements with serving utility companies including, but not limited to, power, telephone, cable TV, water and sanitary sewer service. Observe specification standards, written details, and sketches showing equipment locations and dimensions as indicated by the utility company. Coordinate scheduling of utility company work with all other trades.
- C. Contractor is responsible to locate and protect all existing utilities at Contractors expense.
- D. Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during Work.

- E. If the Contractor plans to perform work within ten (10) feet of any utility pole or other electric or water utility structure owned by the City of Tacoma, the Contractor shall contact the City of Tacoma, Department of Public Utilities, telephone number 253-593-8353, and arrange for an inspection before proceeding. The Contractor shall perform, at the Contractor's expense, such additional work as is required to protect the pole or structure from subsidence. The Contractor may be directed to suspend work at the site of any such excavation until such utility structures are adequately protected.

1.08 CODES AND ORDINANCES

- A. All work of this Contract is to comply with all local, state, and federal codes and ordinances as applicable. In general, the project shall comply with the latest editions of the International Building and Fire Codes (with State of Washington and City of Tacoma adopted amendments), Washington State Department of Transportation Standard Specifications, the State of Washington Barrier Free Code, Uniform Plumbing Code, National Electrical Code and the Washington State Non-Residential Energy Code. (See the Drawings for a listing of codes.)
1. The Contractor shall maintain copies of these codes and ordinances at the job site construction office as required by the Owner, they can be used by construction personnel, Owner, architect, and building inspectors.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 11 00

SECTION 01 12 00 WORK SEQUENCE

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Work sequence and constraints.
- B. Related Sections:
 - 1. 01 31 13 – Project Management and Coordination.

1.02 SUBMITTALS

- A. General: Submit the following in accordance with the Conditions of Contract and 01 33 00 – Submittal & RFI Procedures:
- B. Within seven 7 days after receipt of Notice to Proceed and prior to any demolition or construction on-site by the Contractor, the Contractor shall develop and submit to the Owner for review a Phasing Plan.

1.03 SEQUENCING

- A. Sequence construction to minimize impact to the daily operations of the City of Tacoma's NETP in accordance with the plan provided on the Drawings.
- B. The general priority to the sequence of work shall be:
 - 1. Request permission from the City three (3) Business days in advance of any activities that have the potential to disrupt City's occupancy of adjacent facilities, use of pathways, sidewalks, roads and other transportation improvements of the site, public roadways, electrical power, communications, water utility, fire protection systems, and other systems necessary for operation of the NETP.
 - 2. Verify all dimensions, elevations and existing conditions prior to beginning construction. The contractor shall notify Engineer of any discrepancies prior to starting work.
 - 3. Obtain "Reviewed" or "Reviewed with Comment" disposition for required shop drawings and material data submittals from Engineer prior to any fabrication or construction of the following items: concrete reinforcement, structural steel, embedded steel items, anchors, bracing, piping, and miscellaneous steel.
 - 4. Mark work limits.
 - 5. Install temporary erosion and sedimentation control measures where needed.
 - 6. To mitigate impacts to the NETP operations all foul air piping work shall be phased.

7. City of Tacoma is responsible for completing all PLC and SCADA programming portions of the work, including labor and materials required for this work. Contractor shall install all equipment and instruments and ensure all piping and valves are installed according to manufacturer recommendations.
8. Once certification of proper installation by manufacture has been verified, Contractor shall allow fourteen (14) days for the City to complete programming work and all control integration and control testing related to programming.
9. Demolition of existing 4-inch FA ductwork at Solids Holding Tank shall not occur until new 14-inch FA ductwork is operational and foul air is being treated through new Odor Control Bioscrubber.
10. Coordinate foul air shutdowns and tie-ins with Plant staff.
11. Additional construction sequence and constraints related are indicated on the Drawings.
12. The Contractor shall conduct the work in accordance with a Contractor prepared Phasing Plan as described in Section 01 12 00 (1.02) of this Specification.
13. Work shall be scheduled, sequenced, and performed in a manner which minimizes disruption to the operation and maintenance of existing Vehicle Maintenance Facility.
14. The Contractor shall incorporate the construction and schedule constraints of this Section, including but not limited to Section 01 11 00 – Summary of Work, Section 01 14 00 – Work Restrictions, and Section 01 31 13 – Project Management and Coordination in preparing their Phasing Plan and Construction Schedules required in Section 01 32 00 – Construction Progress Documentation.
15. It is the Contractors' responsibility to review the Project Specifications and Drawings and to develop their own Phasing Plan that describes the sequence of critical events that are necessary to minimize disruption to the ongoing operations of the Facility and to ensure compliance with applicable laws and permit requirements. It shall be understood and agreed by the Contractor that the critical events described are not all inclusive and that additional items of work may be required to minimize disruption and ensure compliance.
16. The Contractor may propose alternative sequencing to perform the work. Deviations from or modification of the Phasing Plan provided in the Drawings is permitted if techniques and methods known to the Contractor will result in reducing disruption to the Facility operation, meets permit requirements, results in the requirements of the Project, and if the deviations or modifications are approved in advance by the Owner.

1.04 SCHEDULING

- A. Refer to Section 01 14 00 – Work Restrictions and Section 01 31 13 - Project Management and Coordination.

1.05 CONTRACTOR'S INSTRUCTIONS

- A. The following provides additional detail to be included on the Contractor's Site Utilization Plan outlined in Section 01 11 00 – Summary of Work.
- B. Disruption of traffic flow shall be carefully managed and monitored to promote safety, and to minimize impacts to Owner's employees and the public during the execution of the Work.
- C. Access to the Project Site shall be limited to the work, staging, delivery and parking areas unless otherwise authorized by the Owner.
- d. At no time shall the Contractor's operations interfere with the safe and orderly operation of Owner-occupied areas of the facility or the surrounding neighborhood.
 - 1. Encroachment by the Contractor's operations will not be permitted unless authorized by the City.
 - 2. Ensure access to the Secondary Treatment facility.
 - 3. Promptly repair or replace improvements damaged or destroyed in the performance of the Work.
 - 4. Ensure full access to Solids Loading Facility and truck route in and out of facility.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 12 00

SECTION 01 14 00 WORK RESTRICTIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Use of site
 - 2. Work restrictions.
 - 3. Concurrent use of North End Wastewater Treatment Plant.
 - 4. Access to site.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.03 USE OF PREMISES

- A. Use of Site: Do not disturb portions of site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to area designated on the Drawings.
 - 2. Owner occupancy: Allow for Owner occupancy of site and Owner access to all facilities within construction operations area daily. Temporary access restrictions shall be coordinated with the Owner.
 - 3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, facility customers, and emergency vehicles at all times. Do not use these areas for parking or storage of materials unless specifically approved by Owner.
 - 3. Schedule deliveries to minimize use of driveways and entrances.
 - 4. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - 5. Parking areas: Do not use employee parking areas for storage of materials except for in areas designated on the plans as Contractor staging area. Make arrangement for offsite employee parking and transport. Striped parking areas at the plant site are designated for City of Tacoma use only unless approved in writing by the Owner.

6. Hours of Work: Except in case of emergency or otherwise approved by the Owner.
 - a. Allowable work hours are 6 AM to 5 PM. Permission to work between the hours of 10 PM and 7 AM during weekdays and between the hours of 10 PM and 9 AM on weekends may be subject to noise control requirements. Contractor shall secure Noise Variance permit from the City of Tacoma for all work generating sound levels in excess of 10 dBA above the ambient sound level from the hours of 7:00 AM to 9:00 PM and in excess of 5 dBA from the hours of 9:00 PM to 7:00 AM (TMC 8.122). Approval to continue work later than 10 PM may be revoked at any time the Contractor exceeds the Owner's noise control regulations or complaints are received from the public or adjoining property owner's regarding the noise from the Contractor's operations. The Contractor shall have no claim for damages or delays should such permission be revoked for these reasons.
 - b. If a Contractor desires to perform work on Holidays, Saturdays, Sundays, or before 7 AM or after 5 PM on any day, the Contractor shall apply in writing to the Owner for permission to work such times. Such requests shall be submitted to the Owner no later than 48 hours prior to the day for which the Contractor is requesting permission to work. Permission to work longer than an 8-hour period on a weekday between 7 AM and 5 PM is not required.
 - c. Permission to work Saturdays, Sundays, holidays or other than the agreed upon normal straight time working hours Monday through Friday may be given subject to certain other conditions set forth by the Owner. These conditions may include but are not limited to: requiring the Owner or such assistants as the Owner may deem necessary to be present during the work; and requiring the Contractor to reimburse the Contracting Agency for the costs in excess of straight-time working costs for Contracting Agency employees who worked during such times. Assistants may include, but are not limited to, survey crews; personnel from the Contracting Agency's material testing lab; inspectors; and other Contracting Agency employees when in the opinion of the Engineer, such work necessitates their presence.

B. Overhead and Erection Work

1. Perform overhead and erection work in accordance with applicable regulations.
2. Schedule, coordinate, mobilize, perform, and de-mobilize erection procedures such that the public is physically excluded from the affected areas.
3. Overhead and erection work is required to be coordinated continuously in advance with the Owner.

C. Overhead Power

1. State law requires any construction work, temporary structures or equipment to maintain a minimum ten (10) foot clearance from utility

power lines greater than seven-hundred fifty volts (750 V) in accordance with WAC 296-24-960.

2. If this Project requires work in proximity to energized lines greater than seven-hundred fifty volts (750 V), notify Tacoma Power immediately so the utility can de-energize and ground the lines, or relocate the lines temporarily. The Owner shall be responsible for costs due to Tacoma Power associated with work required to complete the work described in the Contract Documents.
3. Coordinate with the Owner in advance prior to such work.

D. Access to Site:

1. Direct truck traffic to utilize the existing facility gates designated for use in the Contract Documents.
2. Contractor personnel shall be on site and available to direct truck and equipment traffic at all times such activities are being mobilized, conducted, and de-mobilized.
3. Do not permit trucks, and trucks with pups, to congregate or queue outside the property boundaries.
4. Do not obstruct neighborhood traffic patterns; public work operations, and operations by Metro Parks Tacoma and Union Pacific Railroad.
5. Equipment Delivery:
 - a. Coordinate equipment delivery to occur during low traffic conditions, specifically early morning hours, and not before 7 AM.
 - b. Do not attempt to unload, operate, or load equipment beyond the noise production limitations allowable.
6. Construction Activities:
 - a. Coordinate construction deliveries to occur during times when construction personnel will be on hand to direct the truck driver.
 - b. Post signage on the site indicating the designated route for deliveries to the project.
 - c. Direct drivers regularly through verbal instructions, written materials, notices, and subcontracts about the traffic control plan procedures.
 - d. Recommend adjustments to the traffic control plan as needed to the Owner.

E. Contractor Parking

1. Park only in areas designated by the Owner.
2. The Contractor may park additional vehicles including trucks and trucks with trailers during: a) after hours, b) at night, c) holiday closure periods, and d) early holiday closures within the NETP gated area PROVIDED all the following three (3) conditions are met:
 - a. The vehicles are at no time blocking fire lanes and sludge haul routes; AND
 - b. Facility personnel and managers are able to access the entire site freely and without obstruction at all times night and day; AND
 - c. Emergency vehicles are not impeded from traveling around the facility and accessing all areas.
3. Contractor is cautioned that, at times during construction, there may not be sufficient room to park for essential construction activities on site.

Room for trailers, materials, etc., take priority space. Other arrangements shall be made by the Contractor to satisfy parking requirements for personnel, including offsite parking.

4. Failure of the Contractor to abide by the requirements may result in Contractor and Subcontractor vehicles being immediately towed or otherwise restricted access as determined appropriate by the Owner; the Contractor shall not be entitled to additional compensation on the basis of vehicle removal and exclusion restrictions imposed by the Owner.

1.04 CONCURRENT OPERATION OF NORTH END WASTEWATER TREATMENT PLANT

- A. The Owner's wastewater treatment plant and related process facilities outside of the limits of construction shall remain fully operational and with minimum disruption to planned and unplanned daily and special activities.
- B. The Contractor shall maintain continuous access to other NETP treatment facilities in full operation concurrent with the construction activity.
 1. Request permission from the Owner in advance of any activities that have potential to disrupt Owner's occupancy of adjacent facilities, use of pathways, sidewalks, roads and other transportation improvements of the site, public roadways, electrical power, communications, water utility, fire protection systems, and other systems necessary for operation of the wastewater treatment facilities. The Contractor shall have no claim for damages or delays should such permission be revoked or denied due to unanticipated disruptions to the Owner's operations.
 2. Consult with the Owner to determine the best and most appropriate means of mitigating impacts from construction activities.
 3. Mitigate construction-related impacts to employees of the Owner and the public.
- C. Provide continuous and safe access by the Owner to all areas of the Project Site not specifically designated for work by the Contractor.
- D. Whenever the Contractor's activity affects vehicular or pedestrian traffic, the Contractor shall install and maintain appropriate pedestrian and vehicle barriers and signage for the safety of employees of the Owner and the public. In cases where vehicular traffic is impaired, Contractor shall supply appropriate flagging personnel and traffic control. Costs associated with mitigation of traffic impacts shall be the responsibility of the Contractor.
 1. Review proposed layouts, barriers and signage with the Owner for review and comment prior to placement at the Project Site.
 2. Items and products shall be in good, serviceable condition, appropriately marked and secured against movement, vandalism, and theft.
- E. Maintain required access for fire protection of the buildings at all times.
 1. Comply with requirements of the Tacoma Fire Department.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 14 00

SECTION 01 25 00
ODOR CONTROL BIOSCRUBBER MANUFACTURER SUBSTITUTIONS AND ALTERNATES

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. Section 44 31 21 – Bioscrubber Odor Control Equipment
 - 2. Section 43 11 19.13 Centrifugal FRP Fans
 - 3. Related sections referenced in Sections 44 31 21 and 43 11 19.13.
- B. The Drawings and Specifications contain pertinent configuration, arrangements, dimensions, details, utility requirements, functions and materials for a Basis of Design Odor Control Bioscrubber Manufacturer. The Basis of Design Odor Control Bioscrubber Manufacturer is **Ecoverde, Phoenix, Arizona**. The requirements of this Section 01 25 00 do not apply to the Basis of Design Odor Control Bioscrubber Manufacturer.
- C. Alternate Odor Control Bioscrubber Manufacturers are **Biorem, Puslinch, Ontario and BioAir, Voorhees, New Jersey**.
- D. Substitute Odor Control Bioscrubber Manufacturers not named as Alternates in this Section or Section 44 31 21 will be considered up to 10 calendar days prior to the date and time of Bid Opening. Substitute Odor Control Bioscrubber Manufacturers are allowed only by following the procedures during bidding as specified in Supplementary Conditions SC-1.04.
- E. An approved Substitute or Alternate Odor Control Bioscrubber Manufacturer may only be utilized if that manufacturer is named and circled on the Bid Proposal Form and is the manufacturer upon which the Total Contract Amount is based.
- F. Substitutions or equals will not be accepted for products and components within the Odor Control Bioscrubber Manufacturer's scope of supply specified as having no equal.

1.02 GENERAL CONDITIONS

- A. The Contract Price must be based upon the scope of Work, materials, performance criteria, equipment, and details provided on the Drawings and Specifications. The Contract Price must be based on fulfilling all of the requirements of the Contract Documents, exclusive of which Odor Control Bioscrubber Manufacturer is encircled on Bid Proposal Form.
- B. The Drawings and Specifications Sections contain pertinent details, performance criteria, quality, function, and requirements for materials and methods that are common between Odor Control Bioscrubber Manufacturers.

- C. For the purpose of evaluating suitability of equipment, materials, functionality, features, quality, and performance; all equipment unit responsibilities assigned through Section 44 31 21 – Bioscrubber Odor Control Equipment to the Odor Control Bioscrubber Manufacturer must meet the requirements of this Section.
- D. The Owner has obtained a Puget Sound Clean Air Agency (PSCAA) Notice of Construction (NOC) Permit No. 12213 for the Odor Control Bioscrubber Project. The NOC Application is based on data, features, instrumentation, operations and planned ongoing maintenance activities associated with the Basis of Design Odor Control Bioscrubber Manufacturer.
 - a. By encircling an Alternate or Substitute Odor Control Bioscrubber Manufacturer on the Bid Proposal Form, Contractor shall agree to pay for Engineer's time to reapply for the NOC, pay the PSCAA reapplication fee, provide materials from the Alternate or Substitute Odor Control Bioscrubber Manufacturer supporting the NOC reapplication, and allow up to an additional 60 calendar days of Contract Time prior to Substantial Completion to obtain PSCAA's commitment to move forward with an Order of Approval reissuance or amendment.
 - b. Additional Contract Time will be awarded for accepted Substitute and Alternate Odor Control Bioscrubber Manufacturers via Change Order following Contract Award; based on actual time required (up to 60 calendar days) for PSCAA commitment to move forward with an Order of Approval reissuance or amendment. Deductive amounts as detailed in the following paragraphs will be applied to the Total Contract Amount in the Change Order. No additional costs shall be associated with the Contract Time extension.
 - c. Engineer's labor effort for reapplication for a NOC is estimated to be limited to \$12,000. Time and materials invoices for the Engineer's effort for NOC reapplication will be deducted from Contractor's Payment Requests and Total Contract Amount adjusted. Engineer's invoices documenting actual time required will be included with Payment to the Contractor.
 - d. The PSCAA reapplication fee is \$2,200, consisting of a \$1,550 filing fee and \$650 equipment fee. The Owner will deduct reapplication fee from Contractor's Payment Requests and Total Contract Amount adjusted. The PSCAA invoice and receipt of payment will be included with Payment to the Contractor.

1.03 SUBMITTALS

- A. Procedures: Section 01 33 00 – Submittal & RFI Procedures.
- B. Action Submittals:
 - 1. Includes all submittals specified in Section 44 31 21 - Bioscrubber Odor Control Equipment and related sections through unit responsibility provisions.
 - 2. Additional submittal requirements for Alternate or Substitute Odor Control Bioscrubber Manufacturers:

- a. Manufacturer's name and address
 - b. Point of contact name and phone number
 - c. Itemized comparison of the proposed odor treatment system with equipment details and product data provided in PART 2 of Section 44 31 21 - Bioscrubber Odor Control Equipment. Note variations and differences as they occur in annotated specifications.
 - d. A complete set of the Contract Drawings marked up to show concurrent impacts and deviations related to differences between the Substitute or Alternate Odor Control Bioscrubber Manufacturer's proposed equipment and the detailed design.
 - (a) Illustrate all alterations to all civil, utilities, demolition, structural, architectural, mechanical, electrical, instrumentation, control, and HVAC systems required to accommodate substitute or alternate manufacturer.
 - e. Dimensional drawings, showing required access and clearances, including any changes to the work.
 - f. Connection points for air, water, and other required utilities, including locations, sizes and process fluid criteria (flow rate, temperature ranges, quality).
 - g. A complete description of controls for the odor control treatment system in scripted format.
- 3. Itemization of all costs including any license fee or royalty that will result directly or indirectly from incorporation of substitute or alternate manufacturer's equipment in the work.
 - 4. Itemization of redesign fees by registered engineers in the State of Washington for any other work affected.

1.04 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor is responsible for design changes to suit installation of alternate or accepted substitute Odor Control Bioscrubber Manufacturer.
- B. Drawings and details in the Contract Documents and specifications are based around the Basis of Design Odor Control Bioscrubber Manufacturer. If an accepted Substitute or Alternate odor control bioscrubber manufacturer is utilized, any changes to, or coordination with other portions of the Work shall be made at no additional cost to the City.
- C. Contractor is responsible for all cost and schedule impacts associated with additional reviews by the Owner and Owner's Representatives as specified in this section.
- D. Contractor is responsible for certifying that the revised design and installation to accommodate an approved Substitute of Alternate Odor Control Bioscrubber Manufacturer will adequately perform the functions and achieve the results called for by the design, be similar and of equal substance to that specified and be suited to the same use as that specified.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 29 77
APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Schedule of Values.
 - 2. Procedures for preparation and submittal of Applications for Payment.

1.02 FORMAT

- A. Develop satisfactory spreadsheet-type form generated from the Progress Schedule.
- B. When Change Orders are executed, add Change Orders at end of listing of scheduled activities:
 - 1. Identify change order by number and description.
 - 2. Provide cost of change order in appropriate column.
- C. After completing, submit Application for Payment.
- D. Execute application with signature of responsible officer of Contractor.

1.03 SUBSTANTIATING DATA

- A. Provide Substantiating Data with cover letter identifying:
 - 1. Owner's specification number and project number.
 - 2. Project name and location.
 - 3. Contractor's name and address.
 - 4. Application number and date of submittal.
 - 5. Detailed list of enclosures.
 - 6. For stored products in City of Tacoma with item number and identification on application, description of specific material, and proof of insurance coverage for stored products.
 - 7. Submit certified payroll.

1.04 SUBMITTALS

- A. Application for Payment and Substantiating Data with cover letter: Submit in accordance with Section 01_31_50 - Web Based Construction Document Management.
- B. Prepare progress payment requests on a monthly basis. Base requests on the breakdowns of costs for each scheduled activity and the percentage of completion for each activity.

1.05 SCHEDULE OF VALUES

- A. Submit, in conjunction with the Baseline Schedule, a Schedule of Values per General Conditions 00_72_00, GC-6.02 and Supplementary Conditions 00_73_00, SC-6.02, identifying costs of all construction activities as generated by the schedule. Equate the aggregate of these costs to the Contract Sum.
- B. Submit corrected schedule of values within 5 calendar days upon receipt of reviewed Schedule of Values.
- C. Provide certified payroll statements with application for payment.
- D. Additional breakdown requirements:
 - 1. Separate by defined Phases of Work. Provide sub-schedules showing values correlated with each Phase.
 - 2. For items on which progress payments will be requested for materials or equipment purchased/fabricated/delivered but not yet installed, show "initial value" for payment request and "value added" for subsequent stage(s) of completion on that unit of Work. Identify materials stored on-site or off-site.
 - 3. For each line item of installed value exceeding 5 percent of the Contract Sum, show breakdown by major products or plant operations under each item for ease of review and confirmation of Work completed. Identify material and labor as separate items.
 - 4. Identify each administrative and procedural requirement separately by Phase as a separate line item:
 - a. Mobilization.
 - b. Contract Administration.
 - c. Construction schedule.
 - d. Bonds and insurance at actual cost.
 - e. Demolition and repair.
 - f. Cleanup.
 - g. Record Documents – paid upon acceptance.
 - h. Operation and Maintenance Manuals with Parts Lists – paid upon acceptance.
 - i. Special warranties.
 - j. Temporary facilities.
 - 5. The minimum value shall be no less than 2-percent of the Contract Sum, each, for each requirement listed:
 - a. Cleanup.
 - b. Record Documents.
 - c. Operation and Maintenance Manuals.
 - 6. Round figures to nearest dollar amount.
 - 7. Coordinate items of the Schedule of Values so that there is a corresponding item in the Construction Progress Schedule. If activities are added or removed from the Progress Schedule, revise the Schedule of Values and resubmit.

1.06 PAYMENT APPLICATIONS

- A. General:
1. Submit itemized payment request as required in General and Supplementary Conditions 00_72_00 and 00_73_00 together with Schedule of Values and other submittals as listed herein.
 2. Except as otherwise indicated, sequence of progress payments is to be regular, and each must be consistent with previous applications and payments; it is recognized that certain applications involve extra requirements, including initial application, application at times of Substantial Completion, and final payment application.
 3. By submitting an Application for Payment, Contractor is certifying that to the best of Contractor's knowledge, information, and belief, the work covered by each Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid for work for which previous Applications for Payment were issued and payments received from the City, and that current payment is now due.
 4. Contractor certifying Subcontractor payment: In accordance with General and Supplementary Conditions.
- B. Submit progress payment requests at progress meetings.
- C. Payment Application Times: The City at the pre-construction meeting will establish the date for each progress payment and the period of construction Work covered by each Application for Payment.
- D. Payment Application Forms: In accordance with General and Supplementary Conditions. Provide with continuation sheets for the schedule of values, and place the following paragraphs at the end for signatures:
- "The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Document, that all amounts have been paid by the contractor to employees, subcontractors, suppliers, etc. for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payments shown herein is now due.
- (Contracting Firm)
- By _____ " (SIGN IN INK) Date _____
- E. Application Preparation: Complete every entry on form. Notarize and execute by an Officer of the Company authorized to sign legal documents on behalf of Contractor. Owner will return incomplete applications without action:
1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders issued before last day of construction period covered by application.

- F. Transmittal: Submit in accordance with Section 01_31_50 - Web Based Construction Document Management. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Statement of Intent to pay prevailing wages in accordance with Davis Bacon and related Acts.
 3. Schedule of Values.
 4. Contractor's Construction Schedule (preliminary if not final).
 5. Products list.
 6. Schedule of unit prices.
 7. Submittals Schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal suppliers and subcontractors.
 10. Copies of permits.
 11. Copies of authorizations and licenses from Owner for performance of the Work.
 12. Initial progress report.
 13. Report of preconstruction conference.
 14. Certificates of insurance and insurance policies.
 15. Performance and payment bonds.
 16. Data needed to acquire Owner's insurance.
 17. Other documents as may be required in the Contract Documents.
- H. Applications each Month During Construction: Submit itemized application, each with Contractor's notarized affidavit and signed receipts from Principal Subcontractors and Suppliers as specified below. Also include with each application:
1. Updated construction schedule in accordance with Section 01_32_16 - Progress Schedules and Reports.
- I. Construction Schedule Update: Submit with applications for payment a revised updated project CPM schedule for evaluation and measurement of actual work-in-place with said applications for payment:
1. Application for Payment at Substantial Completion: In accordance with General and Supplementary Conditions.
 2. Final Payment Application: In accordance with General and Supplementary Conditions.
- J. On-going documentation verifications prior to payment: Owner will verify the following documentation prior to payment. Failure to provide current

documentation to Owner's satisfaction shall be considered grounds for withholding progress payment and/or final payment to the Contractor:

1. Current Record Documents: With each Progress Meeting, Contractor is required to present for review to the Owner, a current set of Record Documents in accordance with Section 01_77_00 - Closeout Procedures.
 2. Compliance documents required to satisfy federal and state loan requirements.
- K. Notarization and Signed Receipts: Contractor's Affidavit:
1. After the first request for payment, all copies of each subsequent request shall be accompanied by Contractor's notarized original signature with the statement that all subcontractors and suppliers have been paid to date as their interests appeared in the last payment received (less earned retainage applicable to subcontractors). And shall also be accompanied by a signed receipt from the Principal Subcontractors and Suppliers stating that all sub-subcontractors, suppliers, wages, fringes, and taxes arising out of such subcontract have been paid in full as their interest appeared in the last payment received. Any amounts withheld from any subcontractor's or supplier's payment due to lack of performance, or other reason, shall be fully documented with the statement, indicating the amount and justification of payment(s) withheld.
 2. No application for payment by the Contractor shall be processed unless accompanied by both the affidavit and the receipts.

1.07 PAYMENT FOR STORED MATERIAL

- A. Payment for stored items will be subject to the following:
1. On-Site Materials: Progress payments shall be made for permanent materials and equipment to be incorporated in the Work and properly protected and stored on the project site with invoices from the original supplier provided to substantiate the value.
 2. Off-Site Materials: No payment will be made for materials stored off site.
- B. Stored materials items may be included in monthly application for payment only after drawing and data submittals, if any are required, have been completed per Contract Documents. A maximum of 90 percent will be paid for materials stored.
- C. Partial payment for materials and equipment in advance of installation shall not constitute acceptance thereof and will not relieve Contractor of full responsibility for condition and subsequent acceptance by the City. Faulty materials discovered will be rejected even though partial payment may have been made.

1.08 OVERTIME

- A. Overtime, double shifts and longer than normal shifts will not be considered reason or justification for extra compensation, unless specifically approved in advance and in writing by the Owner.

1.09 SUBSTANTIATING DATA

- A. When Owner requires substantiating information, submit data within 3 days justifying line item amounts in question.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 29 77

SECTION 01 31 13
PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Conservation.
 - 3. Coordination Drawings.
 - 4. Administrative and supervisory personnel.
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 01 12 00 – Work Sequence for construction progress and coordination.
 - 2. Section 01 32 00 – Construction Progress Documentation for preparing and submitting the Contractor's Construction Schedule.

1.03 CONSTRUCTION ORGANIZATION

- A. On-Site Lines of Authority and Communications: Establish on-site lines of authority and communications including attendance at Preconstruction Meeting and Progress Meetings as required by the Owner.
- B. Intra-Project Communications: Comply with procedures for intra-project communications including:
 - 1. Submittals.
 - 2. Reports and records.
 - 3. Recommendations.
 - 4. Coordination drawings.
 - 5. Schedules.
 - 6. Resolution of conflicts.
- C. Permits and Approvals: Verify in writing to Owner within ten (10) days after Notice to Proceed that subcontractors have obtained required permits and inspections for work and for temporary facilities.

- D. Control Use of Site
 - 1. Supervise field engineering and Project layout.
 - 2. Allocate field office and storage space and work and storage areas for use of Contractor and each subcontractor.

1.04 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.
- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Contractor shall organize and hold weekly progress meetings. All meeting agenda and notes shall be prepared by the Contractor and submitted for Owner review. Contractor shall finalize meeting minutes, taking into consideration Owner's review comments.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Pre-installation conferences.
 - 7. Project closeout activities.
- D. Coordination with Utility Providers
 - 1. The contractor shall be responsible for coordination of utilities and shall cooperate with Utility providers for utilities indicated to serve the Project.
 - a. At no time shall the utilities serving the facility be disrupted, shut off, or otherwise interrupted due to the Contract Work unless authorized in writing by the Owner.
 - 2. Utilities may include but are not limited to natural gas, water, sewer, stormwater, telecom, power, and cable television.
 - 3. The Contractor shall coordinate with the Utilities schedule and work requirements for their work.
 - 4. The Contractor shall provide all work necessary to comply with the requirements of the Contract Documents, including repairs of previously performed work that is disturbed by Utility work.

1.05 SUBMITTALS

- A. General: Submit the following in accordance with the 00 72 00 - General Conditions for Washington State Facility Construction of Contract and Section 01 33 00 - Submittal & RFI Procedures.
 - 1. Submit itemized submittal schedule at Pre-Construction meeting.
 - 2. Coordination Drawings: Where work by separate entities requires off-site fabrication of products and materials which must be accurately interfaced and closely intermeshed to produce required results, prepare coordination drawings to indicate how the work shown by separate shop drawings will be interfaced, intermeshed and sequenced for installation.

1.06 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
 - 1. Include special personnel required for coordination of operations with other contractors.
- B. This requirement establishes minimum requirements for the General Contractor's job-site supervisory personnel and shall not limit the total number of assigned staff employed by the General Contractor for proper supervision of the work in accordance with the General Conditions of the Contract.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 GENERAL COORDINATION PROVISIONS

- A. General
 - 1. The Contractor is responsible for the coordination of the work of all trades. Contractor shall check specifications, addenda, and drawings covering all trades as the work progresses. Contractor shall promptly report to the Owner any omissions, conflicts or points requiring clarification.
 - 2. Contractor shall prepare and distribute to each entity performing work at project site, a written memorandum of instruction on required coordination activities, including required notices, reports and attendance at meetings.
 - 3. All Contractors (Prime Contractor and Subcontractors) shall diligently comply with the following requirements:
 - a. Cooperate in planning and layout of the work well in advance of operations.
 - b. Inform other contractors of requirements at proper time to prevent delay or revisions.
 - c. Be informed on the requirements of other contractors and check own work for conflicts with the work of other contracts.
 - d. Insure delivery of materials and performance of work on coordinated schedule with other contracts.

- e. Shall be represented on the job site by the project superintendent at all times when there is construction going on, including the work of subcontractors under their responsibility.
- B. Coordination of Reports/Activities: Coordinate both the procedural timing and the listing (naming and sequencing) of reports/activities required by provisions of this Section and other sections, to afford consistency and logical coordination between submitted reports or lists. Maintain coordination and correlation between separate reports by updating at monthly or shorter time intervals. Make appropriate distribution of each report and updated report to entities involved in the work including Owner and Engineer. In particular, provide close coordination of progress schedule, schedule of values, listing of subcontracts, schedule of submittals, progress reports, and payment requests.
- C. Coordination Drawings: Where work by separate entities requires off-site fabrication of products and materials which must be accurately interfaced and closely intermeshed to produce required results, prepare coordination drawings to indicate how the work shown by separate shop drawings will be interfaced, intermeshed and sequenced for installation. (Comply with submittal requirements of Section 01 33 00 - Submittal & RFI Procedures.)
- D. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner. All cost associate with this work shall be at the expense of the Contractor.
- E. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.
- F. Other Coordination: Contractor shall give the City seventy-two (72) hours advance notice of his/her intention to work overtime, nights, Sundays or holidays, or anytime outside the usual working hours (identified in Section 01 14 00 – Work Restrictions). In no case shall the Contractor do any such work without first notifying the City to permit arrangements for proper inspection. Contractor shall reimburse the additional cost to the City for inspection work on Sundays, recognized holidays, or hours beyond the normal work hours (identified in Section 01 14 00 – Work Restrictions) as defined in the General and Supplemental Conditions. Such reimbursement shall include all additional costs to the City.

END OF SECTION 01 31 13

SECTION 01 31 50
WEB BASED CONSTRUCTION MANAGEMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General Conditions, Supplemental Conditions and Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. e-Builder's Purpose & Utilization
 - 2. Computer Requirements
 - 3. Training & Support
- B. Related Sections include the following:
 - 1. Section 01 31 13 – Project Management and Coordination
 - 2. Section 01 33 00 – Submittal & RFI Procedures

1.03 E-BUILDER (PROJECT MANAGEMENT COMMUNICATIONS)

- A. The Contractor shall use the Internet Web-based Project Management Software communications tool, e-Builder ASP software, and protocols included in that software during this project. The use of project management communications as herein described does not replace or change any contractual responsibilities of the participants.
 - 1. The internet web-based project communications database is on-line and fully functional. User registration, electronic and computer equipment, and Internet connections are the responsibility of each project participant. The sharing of user accounts is prohibited.
- C. Copyrights and Ownership: Nothing in this specification or the subsequent communications supersedes the parties' obligations and rights for copyright or document ownership as established by the Contract Documents. The use of CAD files, processes or design information distributed in this system is intended only for the project specified herein.
- D. Purpose: The intent of using Internet web-based project management software is to improve project work efforts by promoting timely initial communications and responses.
- E. Authorized Users: Access to the web site will be by individuals who are licensed users.
 - 1. The City will provide the Contractor with licensed user accounts for the duration of the project.

2. Authorized users will be contacted directly by the web site provider, e-Builder, who will assign the temporary user password.
 3. Individuals shall be responsible for the proper use of their passwords and access to data as agents of the company in which they are employed.
 4. Only entities with a direct contract with the City or City employees will be allowed to be an authorized user.
- F. Administrative Users: Administrative users have access and control of user licenses and all posted items. DO NOT POST PRIVATE ON COMPANY CONFIDENTIAL ITEMS! Improper or abusive language toward any party or repeated posting of items intended to deceive or disrupt the work of the project will not be tolerated and will result in deletion of the offensive items and revocation of user license at the sole discretion of the Administrative User(s).
- G. Communications: The City and Contractor shall utilize e-Builder for electronic submittal of all data and documents unless specified otherwise by the City throughout the duration of the project. Communication functions are as follows:
1. Document Integrity and Revisions:
 - a. Documents, comments, drawings and other records posted to the system shall remain for the project record. The authorship time and date shall be recorded for each document submitted to the system. Submitting a new document or record with a unique ID, authorship, and time stamp shall be the method used to make modifications or corrections.
 - b. The system shall identify revised or superseded documents and their predecessors.
 2. Document Security:
 - a. The system shall provide a method for communication of documents. The City will control the Contractor's access to e-Builder by allowing access and assigning user profiles to accepted Contractor personnel. User profiles will define levels of access into the system; determine assigned function-based authorization (determines what can be seen) and user privileges (determines what they can do). Documents shall allow security group assignment to respect the contractual party's communication except for Administrative Users. DO NOT POST PRIVATE ON COMPANY CONFIDENTIAL ITEMS!
 3. Document Integration:
 - a. Documents of various types shall be logically related to one another and discoverable. For example, requests for information, daily field reports, supplemental sketches and photographs shall be of reference as related records.
 4. Reporting:
 - a. The system shall be capable of generating reports for work in progress, and logs for each document type. Summary reports generated by the system shall be available for team members.

5. Notifications and Distribution:
 - a. Document distribution to project members shall be accomplished both within the extranet system and via email as appropriate. Project document distribution to parties outside of the project communication system shall be accomplished by secure email of outgoing documents and attachments, readable by a standard email client.
 - b. Review comments made (or lack thereof) by the City on Contractor submitted documentation shall not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for managing, tracking, and documenting the Work to comply with the requirements of the Contract Documents. City's acceptance via automated system notifications or audit logs extends only to the face value of the submitted documentation and does not constitute validation of the Contractor's submitted information.
6. The following Document Types are required to be transmitted in electronic form to the e-Builder web site by licensed users:
 - a. RFI, Request for Information.
 - b. Submittals, including record numbering by drawing and specification section.
 - c. Transmittals, including record of documents and materials delivered in hard copy.
 - d. Meeting Minutes.
 - e. Review Comments.
 - f. Daily Field Reports.
 - g. Construction Photographs.
 - h. Drawings.
 - i. Supplemental Sketches.
 - j. Schedules.
 - k. Specifications.
 - l. Change Orders, Contract Modifications and other change documentation.

1.04 COMPUTER REQUIREMENTS

- A. In addition to other requirements specified in this Section, the Contractor and his sub-contractors and suppliers at every tier required to have a user license(s) shall be responsible for the following:
1. Providing suitable computer systems for each licensed user at the users normal work location with high-speed Internet access, i.e. DSL, local cable company's Internet connection, or T1 connection.
 - a. e-Builder is a web-based environment and therefore subject to the speed and connectivity problems of the Internet. The Contractor is responsible for its own connectivity to the Internet. e-Builder response time is dependent on the Contractor's equipment, including processor speed, Internet access speed, etc. and current traffic on the Internet. The City will not be liable for any delays associated from the usage of e-Builder including, but not limited to slow response time, down time periods, connectivity problems, or loss of information. The Contractor will ensure that connectivity to the e-Builder system meets the minimum requirements described in this Section. Under no circumstances shall the usage of the e-Builder be grounds for a time extension or cost adjustment to the contract.
 2. Each of the above referenced computer systems shall have the following minimum system and software requirements:
 - a. Desktop configuration (Laptop configurations are similar and should be equal to or exceed desktop system.)
 - 1) PC system 500 MHz Intel Pentium III or equivalent AMD processor
 - 2) 128 MB Ram
 - 3) Display capable of SVGA (1024 x 768 pixels) 256 colors display
 - 4) 101 key Keyboard
 - 5) Mouse or other pointing device
 - b. Operating system and software shall be properly licensed.
 - 1) Internet Explorer or other browser (current version is a free distribution for download). This specification is not intended to restrict the host server or client computers provided that industry standard HTTP clients may access the published content.
 - 2) Adobe Acrobat Reader (current version is a free distribution for download).
 - 3) Or, users intending to scan and upload to the documents area of the web site should have Adobe Acrobat (current version must be purchased).
 - 4) Users should have the standard Microsoft Office Suite (current version must be purchased) or the equivalent.

1.05 SUBMITTALS

- A. General: Submit the following in accordance with the 00 72 00 - General Conditions for Washington State Facility Construction of Contract and Section 01 33 00 - Submittal & RFI Procedures.
- B. Provide a List of Contractor's key e-Builder Project Management Software personnel for the City's acceptance. Include descriptions of key personnel's roles and responsibilities for this project. Contractor shall identify their organization's administrator on the list.

1.06 TRAINING & SUPPORT

- A. A group training session or sessions scheduled by the City will be provided for the Contractor. e-Builder users are required to attend the scheduled training sessions they are assigned to. Requests for specific scheduled classes will be on a first come first served basis for available spaces. Companies may also obtain group training from e-Builder at their own expense.
- B. e-Builder will provide on-going support through on-line help files and phone in Technical Support at 1(888) 288-5717.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 UTILIZATION

- A. Requirements of this section are in addition to the requirements of all other sections of the specifications. e-Builder shall be utilized in connection with submittal preparation and information management required by the Sections:
 - 1. 01 32 00 - Construction Progress Documentation
 - 2. 01 33 00 - Submittal & RFI Procedures
 - 3. All other Division 1 Sections.
- B. Record Keeping:
 - 1. Documents shall be submitted by transmission in electronic form to the e-Builder web site.
 - a. The City and their representatives, the Construction Manager and their representatives, the Engineer and their consultants, and the Contractor:
 - 1) Shall respond to documents received in electronic form through the web site and consider them as if received in paper document form.
 - 2) Reserves the right to and shall reply or respond by transmissions in electronic form on the web site to documents actually received in paper document form.
 - 3) Reserves the right to and shall copy any paper document into electronic form and make same available on the web site.

- b. The following are some but not all of the paper documents which require original signature:
 - 1) Contract
 - 2) Change Orders and Change Order Proposals pricing
 - 3) Application & Certificates for Payment, *Notarized and Signed by Corporate Officer*
- C. Design Document Submittals
 - 1. All design drawings and specifications shall be submitted PDF attachments to the e-Builder web site. CAD files shall be furnished upon request.
- D. Shop Drawings
 - 1. Shop drawing and design data documents shall be submitted as CAD .dwg files or PDF attachments to the e-Builder web site.
- E. Product Data
 - 1. Product catalog data and manufacturer's instructions shall be submitted as PDF attachments to the e-Builder web site.
- F. Samples
 - 1. Sample submittals shall be physically submitted as specified in Section 01 33 00 - Submittal & RFI Procedures. Contractor shall enter submittal data information into e-Builder with a copy of the submittal form(s) attached to the sample.
- G. Administrative Submittals
 - 1. All correspondence and pre-construction submittals shall be submitted using e-Builder. Examples of administrative submittals include, but are not limited to:
 - a. All permits and notices for the work.
 - b. List of product substitutions
 - c. List of contact personnel
 - d. Requests for Information (RFI).
 - e. Progress schedules and associated reports and updates.
 - f. Plans for safety, demolition, environmental protection, and similar activities.
 - g. Quality Control plans and reports.
 - h. Any general correspondence.
- H. Compliance Submittals
 - 1. Test reports, certificates, and manufacturer field report submittals shall be submitted on e-Builder as PDF attachments. Examples of compliance submittals include, but are not limited to:
 - a. Field test reports
 - b. Quality control certifications.
 - c. Manufacturer's documentation and certifications for quality of products and materials provided.

- I. Record and Closeout Submittals
 - 1. Operation and maintenance data and closeout submittals shall be submitted on e-Builder as PDF documents during the approval and review stage as specified, with actual set of documents submitted for final. Examples of record submittals include, but are not limited to:
 - a. Operation and Maintenance Manuals: final documents shall be submitted as specified.
 - b. Record drawings: Final documents shall be submitted as specified.
 - c. Extra materials, spare stock, etc.: Submittal forms shall indicate when actual materials are submitted.

END OF SECTION 01 31 50

SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions as Modified by the City of Tacoma and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Preliminary Construction Schedule.
 - 2. Progress Schedule.
 - 3. Submittals Schedule.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Field condition reports.
 - 7. Special reports.
 - 8. Construction photographs.
- B. Related Sections include the following:
 - 1. Division 1 Section 01 31 13 - Project Management and Coordination for submitting and distributing meeting and conference minutes.
 - 2. Division 1 Section 01 33 00 - Submittal & RFI Procedures for submitting schedules and reports.
 - 3. Division 1 Section 01 77 00 - Closeout Procedures for submitting photographic documentation as Project Record Documents at Project closeout.
- C. Failure to comply with the requirements of this section shall be deemed a material breach of contract documents, allowing the City to withhold payment.

1.03 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor activity is an activity that must be completed before a given activity can be started.

- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time available in the schedule is for the Contractor and is not for the exclusive use of the Contractor, and shall be used in priority of who needs to utilize the Float Time first, whether this be the City or the Contractor.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Major Area: A significant section of construction such as sheet pile construction, or a similar significant construction element.
- G. Milestone: A key or critical point in time for reference or measurement.
- H. Look Ahead Schedule: Annotated, detailed version of the Monthly Update Schedule; conforming to the duration of one (1) week back and three (3) weeks ahead. Highlight those activities originally scheduled which were either delayed or progressed in advance of plan.

1.04 SUBMITTALS

- A. Informational Submittals per Section 01 33 00 – Submittal & RFI Procedures.
- B. Daily Construction Reports: Submit electronic and one (1) printed copy at weekly intervals.
- C. Special Reports and photographs: Submit electronic and one (1) printed copy at time of unusual event.
- D. Preliminary Construction Schedule: Comply with the requirements of the General and Supplemental Conditions.
- E. Progress Schedule: Comply with the requirements of the General and Supplemental Conditions.
- F. Material Location Reports: Submit electronic and one (1) printed copy at weekly intervals.

- G. Field Condition Reports: Submit electronic and one (1) printed copy at time of discovery of differing conditions.

1.05 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Progress Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.06 PROGRESS SCHEDULE

- A. Procedures: Comply with the requirements of the General and Supplemental Conditions. If any provisions in this section are in conflict with the General and Supplemental Conditions, the General and Supplemental Conditions takes precedence.
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion and Final Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 15 days, unless specifically allowed by City.
 - 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section 01 33 00 - Submittal & RFI Procedures in the schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - 4. Startup and Testing Time: Include not less than seven (7) days for startup and testing, notwithstanding requirements specified in Division 1 and equipment specifications.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow a minimum of 10 days for Engineer's administrative procedures necessary for certification of Substantial Completion.

- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and show how the sequence of the Work is affected.
 - 1. Phasing: Arrange list of activities on schedule by phase to be reviewed and accepted by City. Separate each phase of work on schedule and identify any work that will be interphased.
 - 2. Area/Discipline Separations: Identify each major area and/or discipline of construction for each major portion of the Work. Indicate where each construction activity within a major area and/or discipline must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Completion of mechanical installation.
 - c. Substantial Completion.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

1.07 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Comply with the requirements of the General and Supplemental Conditions as Modified by the City of Tacoma.

1.08 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. Comply with the requirements in this Section and the General and Supplemental Conditions as Modified by the City of Tacoma.

1.09 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Summary of work underway during the day.
 - 5. High and low temperatures and general weather conditions.
 - 6. Accidents.
 - 7. Meetings and significant decisions.
 - 8. Unusual events (refer to special reports).
 - 9. Stoppages, delays, shortages, and losses.
 - 10. Emergency procedures.
 - 11. Orders and requests of authorities having jurisdiction.
 - 12. Change Orders received and implemented.
 - 13. Services connected and disconnected.
 - 14. Partial Completions and occupancies.
 - 15. Substantial Completions authorized.

- B. Material Location Reports: At weekly intervals, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information on City's RFI form. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

1.10 SPECIAL REPORTS

- A. General: Submit special reports directly to City within one day of an incidence. Distribute copies of report to parties affected by the incidence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site within 1 day, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise City in advance when these events are known or predictable.

1.11 CONSTRUCTION PHOTOGRAPHS

- A. Photographically document the project pre-construction.
- B. City shall have the right to select the subject matter and vantage point from which the photographs are to be taken.
- C. Preconstruction:
 - 1. After Effective Date of the Contract and before Work at the Site is started, take a minimum of 45 exposures of the Construction Site.
 - 2. Particular emphasis on the existing facility features, equipment, objects, layout, etc.
 - 3. Format: Digital, minimum resolution 756 by 504 pixels and 24 bit, millions of color.
- D. Digital Images:
 - 1. Archive using a commercially available photo management system with backup on flash drive.
 - 2. Label each digital image with Project and City of Tacoma, week and year images were produced.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 CONTRACTOR CONSTRUCTION SCHEDULE

- A. Progress Schedule Updating: at monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Actual Completion percentages for each activity.
 - 4. Comply with the requirements of the General Conditions and the Supplemental Conditions as Modified by the City of Tacoma.

END OF SECTION 01 32 00

SECTION 01 33 00
SUBMITTAL & RFI PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General Conditions, Supplemental Conditions, and other Divisions 0 and 1 Specification Sections, apply to work of this Section.

1.02 SUMMARY

- A. Submittals and RFIs shall be made in electronic format using the City's web-based construction management system specified in Section 01 31 50 – Web Based Construction Management. Provide the appropriate document format in order that text is displayed at a minimum of 11 point font size.

1.03 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by Contractor that requires City's approval.
- B. Informational Submittal: Information submitted by Contractor that requires City's review and determination that submitted information is in accordance with the Conditions of the Contract.

1.04 PROCEDURES

- A. Electronic Submittals: Submittals may be made in electronic format in accordance with Section 01 31 50 – Web Based Construction Management.
 - 1. Each submittal shall be an electronic file in Adobe Acrobat Portable Document Format (PDF). Use the latest version available at time of execution of the Agreement. Minimum PDF resolution provided shall be 300 dpi for Word documents and 600 dpi for Drawings and photos.
 - 2. Electronic files that contain more than 10 pages in PDF format shall contain internal bookmarking from an index page to major sections of the document.
 - 3. Add general information to each PDF file, including title, subject, author, and keywords.
 - 4. PDF files shall be set up to print legibly at 8.5-inch by 11-inch, 11-inch by 17-inch, or 22-inch by 34-inch. No other paper sizes will be accepted.
 - 5. Submit new electronic files for each resubmittal.
- B. Transmittal of Submittal:
 - 1. Contractor shall:
 - a. Review each submittal and check for compliance with Contract Documents.

- 01 33 00
Submittal & RFI Procedures

- F. Resubmittals: Clearly identify each correction or change made.
- G. Incomplete Submittals:
 - 1. City will return entire submittal for Contractor's revision if preliminary review deems it incomplete.
 - 2. When any of the following are missing, submittal will be deemed incomplete:
 - a. Contractor's review stamp; completed and signed.
 - b. Transmittal of Contractor's Submittal; completed and signed.
 - c. Apparent non-review by Contractor
- H. Submittals not required by Contract Documents: Will not be reviewed and will be returned stamped "Not Subject to Review."

1.05 ACTION SUBMITTALS

- A. Prepare and submit Action Submittals required by individual specification sections.
- B. Shop Drawings:
 - 1. Identify and Indicate:
 - a. Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.
 - b. Equipment and Component Title: Identical to title shown on Drawings.
 - c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
 - d. Project-specific information drawn accurately to scale.
 - 2. Manufacturer's standard schematic drawings and diagrams.
 - 3. Modify to delete information that is not applicable to the Work.
 - 4. Supplement standard information to provide information specifically applicable to the Work.
 - 5. Product Data: Provide as specified in individual Specifications.
- C. Action Submittal Dispositions: City will review, comment, stamp, and distribute as noted:
 - 1. Reviewed:
 - a. Contractor may incorporate product(s) or implement Work covered by submittal.
 - b. Distribution: Electronic.
 - 2. Reviewed with Comment:
 - a. Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with City's notations.
 - b. Distribution: Electronic.
 - 3. Revise and Resubmit:
 - a. Make corrections or obtain missing portions and resubmit.
 - b. Except for portions indicated, Contractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with City's notations.

- c. Distribution: Electronic.
 - d. Resubmit with numbers added to the submittal .01, .02 etc.
- 4. Rejected:
 - a. Contractor may not incorporate product(s) or implement Work covered by submittal.
 - b. Distribution: Electronic

1.06 INFORMATIONAL SUBMITTALS

- A. General:
 - 1. Copies: via eBuilder, unless otherwise indicated in individual Specification section.
 - 2. Refer to individual specification sections for specific submittal requirements.
 - 3. City will review each submittal. If submittal meets conditions of the Contract, City will forward submittal to appropriate parties. If City determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, City will return review comments to Contractor, and require that submittal be corrected and resubmitted.
- B. Certificates:
 - 1. General:
 - a. Provide notarized statement that includes signature of entity responsible for preparing certification.
 - b. Signed by officer or other individual authorized to sign documents on behalf of that entity.
 - 2. Welding: In accordance with individual specification sections.
 - 3. Installer: Prepare written statements on manufacturer's letterhead certifying installer complies with requirements as specified in individual specification section.
 - 4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
 - 5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual specification sections.
- C. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual specification section.
- D. Schedules:
 - 1. Schedule of Submittals: Prepare separately with Progress Schedule.
 - a. Show for each, at a minimum, the following:
 - 1) Specification section number.
 - 2) Identification by numbering and tracking system as specified under Paragraph Transmittal of Submittal.
 - 3) Estimated date of submission to City, including reviewing and processing time.

- b. On a monthly basis, submit updated Schedule of Submittals to City if changes have occurred or resubmittals are required.
- 2. Schedule of Values: In accordance with Division 1 or the Supplemental Conditions as Modified by the City of Tacoma.
- E. Statement of Qualification: Evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of engineer, materials testing laboratory, specialty Subcontractor, trade, Specialist, consultant, installer, and other professionals.
- F. Submittals Required by Laws, Regulations, and Governing Agencies:
 - 1. Promptly submit promptly notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative.
 - 2. Transmit to City for City's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.
 - 3. LEAP and EIC Reports via the LEAP/EIC program requirements.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 33 00

SUBMITTAL TRANSMITTALSubmittal Description: _____ Submittal No.¹: _____

Spec Section: _____

	Routing	Sent	Received
CITY:	Contractor/CM		
PROJECT:	CM/Engineer		
	Engineer/CM		
CONTRACTOR:	CM/Contractor		

We are sending you: ☐ Attached ☐ Under separate cover via _____
☐ Submittals for review and comment ☐ Product data for

information only

Remarks: _____

Item	Copies	Date	Section No.	Description	Review Action	Review Initials	Review Comments Attached

^a**Note: R = Reviewed; RCW = Review with Comments; A&R = Amend and resubmit; R = Rejected**

Attach additional sheets if necessary

Contractor

Certify either A or B

- ☐ A. We have verified that the material or equipment contained in this submittal meets all the requirements, including coordination with all related work, specified (no exceptions).
☐ B. We have verified that the material or equipment contain in this submittal meets all the requirements specified except for the attached deviations.

No.

Deviation

Certified by: _____

Contractor's Signature

Date: _____

¹See 01 33 00, paragraph 1.04, Procedures

SECTION 01 35 00 HEALTH AND SAFETY

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Special project procedures.
 - 2. Governmental safety requirements.
 - 3. Health, safety, and emergency response procedures.
- B. Related Sections:
 - 1. Section 00 72 00 – General Conditions
 - 2. Section 01 33 00 – Submittal & RFI Procedures
 - 3. Section 01 35 44 – Hazardous Material Procedures
 - 3. Section 01 42 00 – References

1.02 REFERENCES

- A. Comply with requirements of Section 01 42 00 – References; and as listed herein. The following is a list of standards referenced in this Section:
 - 1. Occupational Safety and Health Act of 1970 (OSHA); including any amendments.
 - 2. RCW 49.17 – Washington Industrial Safety and Health Act.
 - 3. Washington Administrative Code (WAC).
 - 4. Revised Code of Washington (RCW):
 - a. RCW 70.105 – Hazardous Waste Disposal Act.
 - b. RCW 70.105D – Hazardous Waste Cleanup-Model Toxic Control Act.
 - 5. SARA Title III Emergency Planning and Community Right-to-Know.
 - 6. Washington Industrial Safety and Health Act of 1973; including but not limited to:
 - a. Chapter 296-24 WAC.
 - b. Chapter 296-27 WAC.
 - c. Chapter 296-50 WAC.
 - d. Chapter 296-62 WAC; Chapter 49-17.
 - e. Chapter 296-155 WAC.
 - f. Chapter 296-360 WAC.

1.03 DEFINITIONS

- A. Health Safety Supervisor
 - 1. The person assigned by the Contractor, and responsible for implementation of the Contractor's Health and Safety Plan.
 - 2. The 'Health Safety Supervisor' can be the same person as the project superintendent.
 - 3. The 'Health Safety Supervisor' can be the same person as the 'Site Safety and Health Officer'.

- B. MSDS: Material safety data sheets.
- C. Notice of Deficiency: Written instructions from regulatory agencies, jurisdictions, and the Owner which identify required changes to the Contractor-prepared plans and programs identified as work of this Section.
- D. Regulated Material: All of the following apply:
 - 1. Materials as defined in Section 00 72 00 – General Conditions for Washington State Facility Construction.
 - 2. A substance classified as “dangerous waste,” in accordance with WAC 173-303.
 - 3. A solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (1) cause or significantly contribute to an increase in mortality or increase in serious, irreversible, or incapacitating reversible illness; or (2) pose, substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed or otherwise managed.
 - 4. Asbestos materials, as defined in Puget Sound Clean Air Agency (PSCAA), Regulations III, Articles 3-4, Removal and Encapsulation of Asbestos Materials.
 - 5. Polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), explosives, radioactive materials, and other materials designated as regulated by regulatory agencies having jurisdictions over such matters.
- E. Site Safety and Health Officer
 - 1. The person assigned by the Contractor, and thoroughly trained in rescue procedures, the use of safety equipment, and the use of gas detectors.
 - 2. The Site Safety and Health Officer can be the same person as the Health Safety Supervisor.

1.04 PERFORMANCE

- A. Health and Safety Requirements for Hazardous Waste Operations: The Contractor shall be responsible for health and safety measures and conditions at the project site, including health and safety of all visitors to the project site such as Owner representatives and agents, at the City of Tacoma’s North End Wastewater Treatment Plant, related to site construction and other activities conducted at the site.
- B. The Contractor shall adhere to all applicable federal, state, and local regulations which apply continuously and are not limited to normal working hours.
 - 1. In the case of conflict between regulations the more stringent regulation or requirement applies.
 - 2. There is no acceptable deviation from the regulations.
 - 3. Violation of the regulations may be determined to constitute a breach of Contract.

- C. The Contractor shall provide all personnel working on the project with required orientation and training on the potential hazards anticipated and the appropriate use of safety equipment.
- D. All information, interpretation, or representation of laws, regulations, or ordinances referenced in the Contract Documents shall not take precedence over the most current laws, regulations, or ordinance itself.
- E. The Contractor shall notify the Owner immediately if unknown underground tanks, barrels, or other chemical containers are found. The Contractor shall stop all work in the vicinity of the unknown container until further direction is received by the Owner.
- F. Prepare and implement the Contractors Health and Safety Plan.
- G. Implement security measures for the Project.
- H. It is not expected that the Contractor will encounter suspect Dangerous Wastes, Lead and/or Asbestos-Containing Waste material.
- I. Accident Notifications
 - 1. Report immediately by messenger or telephone to the Owner any accidents causing death, injuries, or property damage.
 - 2. Written Report:
 - a. Provide a written report to the Owner within three (3) days of the occurrence of an accident.
 - b. Provide full details, witness statements, and corrective actions being taken.

1.05 SUBMITTALS

- A. General: Submit the following in accordance with the 00 72 00 – General Conditions for Washington State Facility Construction of Contract and Section 01 33 00 – Submittal & RFI Procedures.
- B. Contractor's Health and Safety Plan (HASP): The Contractor shall develop and maintain for the duration of Work activities, a written, site specific Health and Safety Plan for hazardous waste operations that will effectively incorporate and implement all applicable federal, state, and local regulations, laws, and requirements.
 - 1. Contractor shall ensure that the HASP meets the requirements of WAC 296-62-300, satisfies Hazard Communications requirements specified in WAC 296-62-054, Construction Safety Standards specified in WAC 296-155, General Safety and Health Requirements specified in WAC 296-24, and all other pertinent requirements.
 - 2. Prepare the HASP under the direction of an industrial hygienist, with at least one year of experience in the development of site-specific plans for hazardous waste sites, or an equivalent person.
 - 3. Submit to the Owner within 10 working days prior to commencement of Work.

4. If the Health and Safety Plan is inadequate to protect employees and the public, the Contractor shall be responsible to modify the Health and Safety Plan to meet the current requirements of the Owner and all other agencies at no additional cost to the Owner.
5. The Owner will review the HASP for general conformance with contract documents but shall not be responsible for its adequacy or implementation. The Contractor shall retain responsibility for all health and safety measures and conditions at the site.
6. Potential Chemical Hazards:
 - a. The exact nature of materials and wastes disposed of at the site is unknown.
 - b. The possibility exists of encountering gases and/or other substances during Work that may be potentially hazardous to the safety and health of personnel, especially those working in the vicinity of open excavations and pipes venting gases.
7. Gas Mitigation: Provide for the protection of employees, and all others from risk of fire explosion, and asphyxiation resulting from any work; and especially those risks associated with:
 - a. Gases encountered during excavation.
 - b. Gases encountered in the foul air (FA) conveyance system and solids holding tank.
8. Include specific measures for continual assessment of working conditions inside the solids holding tank work area.
9. Safety plans that have been prepared for other projects regardless of how similar are not acceptable.
10. Chemicals Labeling and Identification: Take steps to ensure containers of chemical materials at the Project Site are labeled and managed in accordance with regulations.
 - a. Comply with Chapter 296-62 WAC.
 - b. Include MSDS for chemical materials stored, used, or otherwise required for the Project.
11. Incorporate notification of personnel and others in stages consistent with the risk associated with conditions of the Work.
12. Include training for specific work conditions where necessary.
13. Provide assessments of training requirements, staffing and similar information.
14. Provide a system of informing workers and others about the conditions of the Work as follows.
 - a. Stage 1 – Baseline work conditions requiring at a minimum notification to every worker of the presence hazardous waste, and instructions on how to obtain additional information.
 - b. Stage 2 – Special work conditions that involved particular hazards including but not limited to work at the face of a cut into refuse; handling of Regulated Material; limiting exposed persons; the Contractor is required to provide instructions to those persons on how to mitigate hazards.
 - c. Stage 3 – Emergency conditions requiring immediate actions on the part of workers and others to avoid and limit risk to person and property.
 - d. Make each stage compliant with Right to Know regulations.

15. Include specific measures for continual assessment of working conditions in the vicinity of the excavation work area.
 - a. Continual assessment includes gas detection and other monitoring activities.
 16. Identify responsible parties to implement stages of the Contractor's Health and Safety Plan.
- C. Revisions to the Contractor's Health and Safety Plan
1. Revise the Contractor's Health and Safety Plan prior to the start of work as necessary to accommodate changes requested by the City, regulatory agencies, and jurisdictions.
 2. Include changes and modifications required by the Owner.
 3. Revise the Contractor's Health and Safety Plan as necessary to accommodate changes in site conditions.
 4. Provide a copy of the revised plan to the Owner and post the revised copies per the requirements for the original submittals.
- D. Contractor Injury Summary Report
1. Submit a copy of the completed report to the Owner the first workday of each month.
- E. Contractor Hot Work and Confined Space Permits
1. Notify City of any and all work requiring hot work and/or confined space entry. Contractor shall NOT perform any work until City provided documentation is completed, returned, and approved by City.

1.06 QUALITY ASSURANCE

- A. Comply with applicable codes, rules, and regulations, and Article 5.07 in Section 00 72 00 – General Conditions for Washington State Facility Construction, and the requirements of this Section.
- B. Regulatory Requirements: See referenced codes, regulations – Section 01 42 00 – References.
- C. Ensure that subcontractors receive a copy of this specification section. The Contractor is responsible for ensuring compliance with the Health and Safety Plan.
- D. Post copies of the accepted programs at the Contractor's job site office, and at each of the subcontractors' offices.
- E. The Contractor shall adopt and adapt its own company health and safety plans to prepare the Contractor's project-specific health and safety plan for this Project.
- F. Contractor Injury Summary Report: In the event an accident should occur, the Contractor shall submit to the Owner the Contractor's Injury Summary report in accordance with the Contractor's health and safety plan.

- G. Chemicals Safety
 - 1. In addition to the above requirements, take steps to ensure containers of chemical materials at the Project Site are labeled and managed in accordance with the regulations, and manufacturer's written instructions.
 - 2. Comply with Chapter 296-62 WAC.
 - 3. Maintain copies of MSDS for chemicals stored, used, or otherwise necessary for the Work.
 - 4. Include MSDS in the Contractor's health and safety plan for this Project.
- H. Fire Safety
 - 1. Comply with applicable rules and regulations, including but not limited to requirements of the Tacoma Fire Department.
 - 2. Provide and maintain appropriate and sufficient fire prevention measures at all times during the course of the Work.
 - 3. Protect persons and property from damage and injury during flame cutting of steel on the Project Site.

1.07 PROJECT/SITE CONDITIONS

- A. Prior to the start of and during the course of the Work (above and below ground) the Contractor shall make a thorough survey of the entire Project Site to determine all potential hazards.
- B. Workers shall be made aware of those hazards and shall be instructed in procedures and the use of equipment for their protection.
 - 1. Inform employees, subcontractors, and subcontractor employees of the dangers associated with working on, and near high purity oxygen.
- C. The Contractor shall verify the location and condition ("live" or "dead") of all utilities above and below grade on and near the Project Site and take precautions to protect his/her employees, the general public, and the property.
- D. Imminent Danger
 - 1. The Contractor shall be wholly responsible for any accidents (including death) occurring at any time during the progress of the Work and until the final acceptance of the work by the Owner which may happen to any of his/her contractor's employees or those working on its behalf or those of any Subcontractor employed on the building, or for any damage or injuries (including death) which his/her work and operations may cause to the work being constructed, or to existing buildings, or to any tenants and occupants of the property, or of the adjoining properties, or to the public, or to any public or private property.
- E. Safety
 - 1. The Contractor shall ensure that all employees, visitors, subcontractors' employees, and suppliers' employees, while on the Project Site, comply with the requirements of WISHA, these requirements and the safety precautions contained in the several Specifications Sections.

2. The Contractor shall promptly and fully comply with, execute and, without separate charge thereof to the Owner, shall enforce compliance with the provisions of the Washington Industrial Safety and Health Act of 1973 as amended, with particular attention paid but not limited to Chapter 296-155, WAC Safety Standards for Construction Work; with particular attention paid but not limited to Chapter 296-24 WAC General Safety and Health Standards; with particular attention paid but not limited to Chapters 296-27, 196-350 and 296-360 WAC regarding Administrative Safety and Health Act Chapter 49-17 RCW, and any addenda thereto.
 3. The Contractor shall immediately advise the Owner of inspections conducted by WISHA at the Project Site and shall transmit copies of citations and violations to the Owner.
- F. Failure to Comply
1. If the project is shut down due to the Contractor's failure to comply with the requirements of WISHA or other applicable safety requirements, no part of the time loss due to any such suspension of operations or stop orders shall be made the subject of a claim for extension of time or for increased cost or damage by the Contractor.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Contractor shall be responsible for carefully reviewing the entire scope of work, the work site location, adjacent structures and systems, and applicable Contract Documents requirements to fully inform and satisfy itself, by personal review and examination, or by such other means as they prefer, of the safety considerations and requirements that must be addressed and planned prior to the start of work.
- B. Utilities: Take appropriate precautions in working on or near utilities, and dangerous systems.
- C. Failure to Perform Duties of this Section: The Owner may suspend the Work of the Project in response to the Contractor's failure to administer, revise and implement the required Contractor's health and Safety Plan, and the Health and Safety Plan.
 1. The Contractor will not be granted schedule extensions arising from health and safety related suspensions of Work.
 2. The Contractor will not be entitled to additional compensation arising from health and safety related suspensions of Work.
- D. Compliance Monitoring: The Owner will audit the Contractor's performance of the work of this Section.
 1. The Owner may issue a directive to stop work on all, or a portion of the Work, in conditions where protections and management of safety risks for

on-going work is not being appropriately addressed by the Contractor, as deemed appropriate by the Owner.

END OF SECTION 01 35 00

SECTION 01 35 44
HAZARDOUS MATERIAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: Procedures required when encountering suspected hazardous materials at the Work site not otherwise identified in the Contract Documents.

1.02 REFERENCES

- A. Washington Administrative Code (WAC):
 - 1. Chapter 296-62-077 Occupational Health Standards: Asbestos, Tremolite, Anthrophyllite, and Actinolite.
 - 2. Chapter 296-65 Asbestos Removal and Encapsulation.
 - 3. Chapter 296-155 Safety Standards for Construction Work
- B. Washington Division of Occupational Safety and Health Administration (DOSH).
- C. Occupational Safety and Health Administration (OSHA).
- D. United States Code of Federal Regulation (CFR):
 - 1. Title 29 - Labor:
 - a. 1926.62 - Lead.
 - 2. Title 40 - Protection of Environment:
 - a. 261 - Identification and Listing of Hazardous Waste.

1.03 SUBMITTALS

- A. Submit laboratory reports, hazardous material removal plans, and certifications when requested by the City.
- B. Submit a work plan prior to commencing with the removal and legal disposal of hazardous materials encountered. Work plan shall include, but not be limited, to the following:
 - 1. Schedule of work.
 - 2. Security measures for work and disposal area.
 - 3. Staff training: Contractor shall provide at least one competent person who is capable of identifying lead and asbestos hazards at the job site for the entire duration of any lead, asbestos, or silica removal and disposal operations.
- C. Submit manifests of all hazardous materials disposed of, including quantity and nature of materials disposed of, disposal facility location, transport agency, tipping fees, and chain of-custody forms and signatures.

1.04 DEFINITIONS

- A. Adequately Wet: Continuous penetration of the pipe wall with liquid to prevent release of particulates.
- B. Competent Person: A qualified and certified worker who is capable of identifying existing and predictable lead and asbestos hazards, perform exposure assessment and monitoring, is qualified to train other workers, oversees all abatement work to ensure compliance with applicable federal, state, and local regulations, and has the authority to take immediate corrective action to eliminate a hazardous exposure.
- C. Asbestos - Containing Material (ACM).
- D. Non-friable Asbestos - Containing Material (NACM): Material containing more than 1 percent asbestos, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
- E. Regulated Asbestos - Containing Material (RACM): Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder in the course of work.

1.05 HAZARDOUS MATERIALS PROCEDURES

- A. Hazardous materials are those defined by 40 CFR and State specific codes.
- B. If hazardous materials are suspected:
 - 1. Should suspect material not identified in this Section be encountered, immediately suspend all work that could disturb said material and notify the Owner. Do not proceed with work that could disturb the material until authorized by the Owner, in writing, to do so.
- C. Forward to Owner, copies of reports, permits, signed receipts, signed shipping manifests, bill of lading with quantities indicated, and other documentation related to remedial work.
- D. Assume responsibility for worker health and safety, including health and safety of subcontractors and their workers:
 - 1. Instruct workers on recognition and reporting of materials that may be hazardous.
- E. File requests for adjustments to Contract Times and Contract Price due to the finding of Hazardous Materials in the Work site in accordance with Contract Documents:
 - 1. Minimize delays by continuing performance of the Work in areas not affected by hazardous materials operations.

1.06 LEAD PAINT IDENTIFICATION, REMOVAL, AND DISPOSAL

- A. The City's inspection has determined to the best of its ability that the proposed construction areas, under this Contract and the materials therein, does contain lead.

1.07 ASBESTOS MATERIALS

- A. The City's inspection has determined to the best of its ability that the proposed construction under this Contract and the materials therein do not contain asbestos.
- B. The Contractor is hereby made aware that concealed suspect asbestos-containing building materials may be uncovered during the course of demolition or renovation work. Contractor shall have contingency plan that include stopping work, evacuation of the immediate area, and sampling by a certified AHERA Building Inspector whenever these materials are found.
- C. It is the specific requirement of these Contract Documents to exclude from the Work any and all products or materials containing asbestos. No products containing asbestos shall be incorporated in the Work.
- D. Notify the Owner immediately if ACM or suspected ACM is encountered. This includes electrical components that appear to be crumbling, made of cement-like material, or woven fabric or mastic. Do not disturb such material until approved by Owner.

1.08 SILICA

- A. The Contractor shall anticipate encountering silica when core drilling or performing other building penetrations through existing concrete and masonry. Contractor shall take all precautions necessary to protect workers and public from silica dust while performing Contract Work in accordance with WAC 296-840.

END OF SECTION 01 35 44

SECTION 01 42 00 REFERENCES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions as Modified by the City of Tacoma and other Division 1 Specification Sections, apply to this Section.

1.02 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. “Alternate” or “Alternates”: The terms “Alternate” or “Alternates” are defined as alternate products, materials, equipment, installations or systems for the work, which may, at City's option and under terms established by these specifications be selected and attached by reference to the City-Contractor Agreement to either supplement or displace corresponding basic requirements of contract documents. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "allowances", "unit prices", "change orders", "substitutions" and other similar provisions
- C. “As directed”: As required to complete the Work in accordance with all the requirements of the contract, and in conformance with codes, rules, regulations, and requirements of authorities having jurisdiction.
- D. “Attendant”: As in ‘all patching including attendant excavation’; in this instance meaning excavation required as a result of having to perform the patching.
- E. “Authority having jurisdiction”: The agency or governmental authority responsible for enforcing codes, laws, rules, and other regulatory forces imposed on the Project, or Work.
- F. “Bid Proposal”: The offer of a bidder, on the prescribed proposal form, properly executed, to perform the contract.
- G. “Bidder”: A qualified individual, partnership, firm, corporation or joint venture licensed to do business in the State of Washington submitting a proposal.
- H. “City”: Shall mean City of Tacoma. Synonymous with “Owner”. Typically, during construction, the City will be represented by a designated project manager or construction manager employed by the City of Tacoma.
- I. “City’s Agent”: An outside person or firm designated by the City as a representative of the City for certain specific tasks.

- J. "Commissioning Authority": An engineering consultant employed by the City to lead and perform commissioning activities.
- K. "Commissioning Authority": An engineering consultant employed by the City to lead and perform commissioning activities.
- L. "Contract": The written agreement between the contracting agency and the contractor setting forth the obligations of the parties thereunder including, but not limited to, the performance of the work, the furnishing of labor and materials, and the basis of payment. The contract includes the proposal, plans, specifications, addenda, supplemental agreements and change orders modifying, extending or decreasing the work.
- M. "Coordinate": The term "coordinate" means satisfactorily combine the work of all trades for a complete and operating installation.
- N. "Contract Bond": The approved form of security furnished by the Contractor and his surety as required by the contract.
- O. "Contractor": The individual, partnership, firm corporation, or joint venture contracting with the City for performance of the prescribed work.
- P. "Directed": A command or instruction by City. Other terms including "requested", "authorized", "selected", "approved", "required", and "permitted" have the same meaning as "directed". Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted" and "permitted" mean "directed by City ", "requested by City ", etc. However, no such implied meaning will be interpreted to extend City's responsibility into Contractor's area of construction supervision.
- Q. "Drawings": The contract drawings which show the location, character, dimensions and details of the prescribed work. Also may be referred to as "Plans".
- R. "Experienced": When used with an entity, "experienced" means having successfully completed a minimum of five (5) previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- S. "Furnish": Supply and deliver materials, equipment, items and products to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- T. "Indicated": The term "indicated" refers to graphic representations or cross-reference to notes, or schedules on the Drawings or other paragraphs or Schedules in the Project Manual (Specifications) and similar requirements in the Contract Documents. Terms such as "shown", "noted", "scheduled", and "specified" may be used in lieu of "indicated" to help the reader locate cross-references. No limitation of location is intended except as specifically noted.

- U. "Install": Operations at Project site including unloading, temporarily storing, unpacking, protection, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- V. "Installer": Contractor or other entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. The term "experienced", when used with the term "installer", means having a minimum of five (5) previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.
 - 2. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
 - 3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
- W. "Manufacturer's Installation instructions": Includes instructions on the correct, intended means of installation and incorporation of a product or system into the construction for human occupancy.
 - 1. Shall include a narrative describing the sequence of activities necessary for the correct, intended means of installation.
 - 2. Shall include information on the usual means of incorporation into the Work, including attachment, anchoring, placement, and securing.
 - 3. Throughout the Contract Documents, although it may not be specifically stated, the Contractor is to install all Work in accordance with Manufacturer's instructions and directions.
 - 4. Where Contractor is required to follow Manufacturer's instructions, directions and the like, but more than one manufacturer is involved in the Work, or its component parts, the Contractor must follow all Manufacturer's instructions, directions and the like.
 - 5. In the event of a conflict between Manufacturer's recommendations and Manufacturer's instructions, the Contractor must submit the discrepancy to the Manufacturer identified in this Section for an opinion as to resolution.
- X. "Plans": The contract drawings which show the location, character, dimensions, and details of the prescribed work. Also may be referred to as "Drawings".

- Y. Product Data Sheets
1. Includes the manufacturers stated purpose for the product.
 2. Includes information on testing that has been performed on the product for verification that it meets or exceeds standards of quality, performance, and other attributes.
 3. Includes information about the characteristics of the product, including whether it is part of a system, accessories required for use with the product, and similar information.
 4. Includes ordering information, packaging sizes, dimensions, available colors, and all necessary for proper review.
 5. Manufacturers' installation instructions are not substitutes for product data sheets.
 6. Products required for use by other trades not associated with construction will be reviewed on a case-by-case basis.
- Z. "Provide": Pay for, furnish and install, complete and ready for the required use.
- AA. "Product": The term used in the Project Manual includes materials, systems and equipment provided by the Contractor for use in the Work.
- BB. "Project Manual" includes:
1. General and Supplementary Requirements and Specifications Division 0-1,
 2. Technical Specifications, Divisions 2 through 48,
 3. Drawings,
 4. Appendices,
 5. and Project Details.
- CC. "Project Site": Space available to Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of Project. The extent of Project site is shown on Drawings and may be identical with the description of the land on which Project is to be built.
- DD. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- EE. "Required": As necessary and appropriate for satisfactory performance and completion of the Work, and to meet the full requirements of the Contract in accordance with applicable codes, rules and regulations.

- FF. "Reviewed": Where used in conjunction with City's response to submittals, requests, applications, inquires, reports, and claims by Contractor, the meaning of the term "acceptance" will be held to limitations of City's responsibilities and duties as specified in General and Supplemental Conditions. In no case will "acceptance" by City be interpreted as a release of Contractor from responsibilities to fulfill requirements of the contract documents. Whenever a material, article or piece of equipment is identified on the Drawings or in the Project Manual by reference to manufacturer's or vendor's names, trade names, catalog numbers, or the like, and followed by the wording "or equivalent", "or accepted substitute" or "equivalent, as accepted", it is so identified for the purpose of establishing a standard, and any material, article, or piece of equipment of other manufacturers or vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or piece of equipment so proposed is, in the opinion of the City, of equivalent substance, appearance or function and has been approved by the City in writing prior to bid opening in conformance with the provision of the Instruction to Bidders. It shall not be purchased or installed by the Contractor without the City's prior written approval.
- GG. "Satisfactory": The term "satisfactory" means "satisfactory to the City/Engineer". The City, in consultation with the Engineer, shall be the sole judge of the acceptability of a product or an installation.
- HH. "Selected": The term "selected" means "selected by the City" and is not necessarily limited to a manufacturer's standard line of colors, finishes or details.
- II. "Sight-exposed":
 1. Surfaces and items that are visible by a person performing a normal inspection, and furthermore in a sitting, standing or otherwise ordinary position.
 2. Surfaces that are part of a larger assembly, but that are partly concealed or obstructed by elements of other construction are considered sight exposed surfaces for the entirety of the assembly.
- JJ. "Similar to": Where the words "similar to" are used and followed by a manufacturer's name and product, model, or type number, such manufacturer, product, model or type number shall be considered as the standard of quality for the item or product work specified, in a general and technical sense, not meaning "identical", and the provisions of the paragraph herein pertaining to "or acceptance" shall apply to any other proposed material, article, or piece of equipment of other manufacturers or vendors.
- KK. "Specialist": An individual or firm of established reputation in an area of specialty.
 1. This individual or firm must be regularly engaged in and maintain a regular force of workers skilled in manufacturing, fabricating, or otherwise performing required technical work at a level of proficiency suited to the Project.

- LL. “Specifications”: The compilation of provisions and requirements for the performance of prescribed work.
- MM. “Subcontractor”: An individual, partnership, firm, corporation or joint venture, to which the Contractor sublets part of the contract.
- NN. “Surety”: The sureties or surety company who engage to be responsible for the bidder's execution of the contract and contract bond, or is bound with the Contractor to insure performance of the contract, payment of all obligations pertaining to the work, and fulfillment of such other conditions as are specified in the contract and contract bond, or otherwise required by law.
- OO. “Testing Agencies”: Independent entity engaged to perform specific inspections or tests, either at Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
- PP. Verify
1. Perform necessary evaluation, measurement, quantification, qualification, checking, study and investigation to determine conditions, measurements, tolerances, completeness or some other important aspect of the Work, or of existing conditions, materially and necessarily meets the appropriate criteria for the Work.
 2. Verification is often required prior to commencing field activities associated with a portion of the Work.
- QQ. “Warranty Bond”. Guarantee for the City that the contractor will solve all warranty issues during the specified warranty period, which is 1 year from completion/acceptance of the project.
- RR. “Work”: Work shall mean the furnishing of all labor, equipment, and other incidentals necessary to the successful completion of the project and the carrying out of all the duties and obligations imposed by the contract. “Work” is described by Contract Documents and excludes only items identified as “N.I.C.” (Not In Contract).
- SS. Work Result
1. A summation of the work activities necessary to achieve the prescribed results of systems that make up significant portions of the Work.
 2. Section of the specifications that include Work Results in the title, bring together aspects of several Sections into a single integrated common whole.

1.03 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on CSI's 48-Division format and Master Format's numbering system.

- B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Streamlined Language: The Specifications generally use the imperative mood and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

The words "shall be" are implied where a colon (:) is used within a sentence or phrase.

- C. Complementary Documents: Specifications and Drawings are complementary documents used to describe the Contract Work. Information identified, referenced or indicated in one but not in the other shall be included in the Contract Work and the Bid as if it were inclusive of both the drawings and the specifications.

1. In the case of inconsistency between the Drawings and the Specifications or within either document, the Contractor shall request clarification during the bid process. In the event that inconsistencies are discovered prior to bid opening, but too late to request clarification during the bid process, the Contractor shall provide, in the Bid, the greater of or stricter of Work required for a complete and functional installation, in accordance with the City's interpretation, without additional compensation to the Contractor or added cost to the City.

- D. Tense, Gender, Singular, Plural

1. Present tense words include future tense.
2. Words in masculine gender include feminine and neuter genders.
3. Words in the singular include plural.
4. Plural words include singular.

- E. Specification by Reference

1. Materials referenced in the Specifications by standard, or number; symbol; or title of a specific standard complies with the following:
 - a. Be identified as a trade association standard, such as the American Architectural Manufacturers Association (AAMA); or
 - b. Be identified as a state or federal specification, such as the Washington State Department of Transportation Standard Specifications for Road, Bridge, and Municipal Construction; or

- c. Be identified as standard employed by an independent research and testing organization, such as Underwriters Laboratories, American National Standards Institute, or American Society for Testing and Materials.
- F. Methods of Specifying
 - 1. The techniques of specifying employed to communicate requirements varies through the Specifications.
 - 2. Techniques may include the following methods:
 - a. Prescriptive.
 - b. Open-generic prescriptive.
 - c. Compliance with standards.
 - d. Performance.
 - e. Proprietary.
 - f. A combination of these.
 - 3. The techniques employed for one unit of Work has no bearing on the requirements for another unit of Work.

1.04 DRAWINGS, DIMENSIONS & MEASUREMENTS

- A. General
 - 1. Where on any of the drawings a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to all other portions of the work.
 - 2. Where the word “similar” or (“sim.”) occurs on the Drawings, it shall be interpreted in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection with other parts of the work.
- B. Content of Drawings by Discipline
 - 1. The Contract Documents include drawings, details, schedules, specifications etc. categorized by various disciplines for the convenience of the bidder but are not intended to define the exact content of each sub-bid - that is the job of the Prime Bidder.
 - 2. While each category of the documents work associated with that discipline, they also may show work of other disciplines for clarification or coordination of the work. Inclusion of such information is for the convenience of the bidder and sub-bidder and does not relieve the bidder or sub-bidder of the responsibility to include all required work in their bid. Each trade must be fully familiar with the drawings of other trades to determine a comprehensive bid amount.

1.05 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to City/Engineer for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.
- E. Drawing Symbols: Except as otherwise indicated, graphic symbols used on Drawings are those symbols recognized in the construction industry for purposes indicated; refer also to the Drawings.

1.06 ABBREVIATIONS AND ACRONYMS

- A. Project Specific Abbreviations
 - 1. COT: City of Tacoma
 - 2. ES: Environmental Services
 - 3. ESSE: Environmental Services, Science and Engineering
 - 4. PWD: Public Works Department
 - 5. TPD: Tacoma Police Department
 - 6. TMB: Tacoma Municipal Building
 - 7. TPU: Tacoma Public Utilities
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web site addresses are subject to change and are believed to be accurate and up to date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(202) 862-5100
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
ACI	American Concrete Institute	(248) 848-3700
ADAAG	Americans with Disabilities Act (ADA)	
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118

AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
ASCA	Architectural Spray Coaters Association www.ascassoc.com	(609) 848-6120
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (212) 591-7722
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9585
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
CFR	Code of Federal Regulations	
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CWHSSA	Contract Work Hours and Safety Standards Act	
ICBO	International Conference of Building Officials	
ICC	International Code Council	
ICC-ES	ICC Evaluation Service, Inc.	
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937

NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(281) 228-6200
NEC	National Electric Code (NFPA 70)	
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NESC	National Electric Safety Code	
NFPA	National Fire Protection Association www.nfpa.org	(800) 344-3555 (617) 770-3000
SAE	SAE International www.sae.org	(724) 776-4841
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	Steel Structure Painting Council	
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
SWRI	Sealant, Waterproofing, and Restoration Institute www.swrionline.org	(816) 472-7974
TSWMM	Tacoma Surface Water management Manual	
UMC	Uniform Mechanical Code	
UPC	Uniform Plumbing Code	
WAC	Washington Administrative Code	
WISHA	Washington Industrial Safety and Health Act	
WSDOT/ APWA	Washington State Department of Transportation and American Public Works Association Standard Specifications	

- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web site addresses are subject to change and are believed to be accurate and up to date as of the date of the Contract Documents.

EPA	Environmental Protection Agency www.epa.gov	(202) 260-2090
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
L&I	Washington State Department of Labor & Industries	
DOE	Washington State Department of Ecology	
DOR	Washington State Department of Revenue	
GA	Washington State Department of General Administration	

1.07 GOVERNING REGULATIONS AND AUTHORITIES

- A. General
1. The procedure followed by the Engineer has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing the contract documents, recognizing that such information may or may not be of significance in relation to the Contractor's responsibilities for performing the work.
 2. Contact governing authorities directly for necessary information and decisions having a bearing on the performance of the work.
 3. Notwithstanding reference in these Specifications to any rule or regulation, the Architect does not assume any duty to provide supervision of construction methods or processes.
- B. List of Local Governing Agencies
1. Building: City of Tacoma Planning and Development Services (PDS)
 2. See Supplemental Conditions
- C. Trade Jurisdictions
1. It is a procedural requirement that the Contractor maintain, and require the prime subcontractors to maintain, complete current information on jurisdictional matters, regulations, actions and pending actions, as applicable to the performance of the work, and that these be discussed at appropriate project meetings at the earliest feasible dates, and that information of particular relevance be recorded along with actions agreed upon.
 2. The manner in which the contract documents have been organized and subdivided is not intended to be an indication of jurisdictional or trade agreements.

3. Assign and subcontract the work and employ tradesmen and labor, in a manner which will not unduly risk jurisdictional disputes of the kind which could result in conflicts, delays, claims and losses in the performance of the work.

1.08 SUBMITTALS

- A. General: Submit the following in accordance with the 00 72 00 - General Conditions for Washington State Facility Construction of Contract and Section 01 33 00 - Submittal & RFI Procedures.
- B. Permits, Licenses, and Certificates: For the City's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established in conjunction with compliance with standards and regulations bearing upon performance of the Work, within 5 working days of their receipt by the contractor.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 43 33
MANUFACTURER'S FIELD SERVICES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Person-Day: One person for 8 hours within regular Contractor working hours.
- B. Related Sections:
 - 1. Section 01 61 00 – Common Product Requirements
 - 2. Section 01 78 23 – Operation and Maintenance Data
 - 3. Section 01 91 14 – Equipment Testing and Facility Startup
 - 4. Section 44 31 21 – Odor Control Bioscrubber Equipment

1.02 SUBMITTALS

- A. Informational Submittals: The Odor Control Bioscrubber Manufacturer shall
 - 1. Training Schedule: Submit, in accordance with requirements of this Specification, not less than 21 days prior to start of equipment installation and revise as necessary for acceptance.
 - 2. Lesson Plan: Submit, in accordance with requirements of this Specification, proposed lesson plan not less than 21 days prior to scheduled training and revise as necessary for acceptance.
 - 3. Training Session DVDs or .MOV or .MP4 USBs: Furnish Owner with three complete sets of DVDs or USBs fully indexed and cataloged with printed label stating session and date recorded.

1.03 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

- A. Authorized representative of the Odor Control Bioscrubber Supplier, factory trained and certified, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system, with full authority by the Odor Control Bioscrubber Supplier to issue the certifications required of the manufacturer. Additional qualifications may be specified in the individual specification sections.
- B. Representative subject to acceptance by Owner and Engineer. No substitute representatives will be allowed unless prior written approval by such has been given.

1.04 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

- A. Furnish manufacturers' services, when required by an individual specification section, to meet the requirements of this section.
- B. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, time required to perform specified services shall be considered incidental.

- C. Coordinate with Owner and Contractor to schedule manufacturer' services to avoid conflict with other onsite testing or other manufacturers' onsite services.
- D. Determine, before scheduling services, that conditions necessary to allow successful testing have been met.
- E. Only those days of service approved by Owner will be credited to fulfill specified minimum services.
- F. When specified in individual specification sections, manufacturer's onsite services shall include:
 - 1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of Contractor's assembly, erection, installation or application procedures.
 - 2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish Manufacturer's Certificate of Proper Installation.
 - 3. Providing, on a daily basis, copies of manufacturers' representative's field notes and data to Owner.
 - 4. Revisiting the Site as required to correct problems and until installation and operation are acceptable to Engineer/Owner.
 - 5. Resolution of assembly or installation problems attributable to or associated with respective manufacturer's products and systems.
 - 6. Assistance during functional and performance testing, and facility startup and evaluation.
 - 7. Training of Owner's personnel in the operation and maintenance of respective product as required.

1.05 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

- A. When so specified, a Manufacturer's Certificate of Proper Installation form, a copy of which is attached to this section, shall be completed and signed by equipment manufacturer's representative.
- B. Such form shall certify signing party is a duly authorized representative of manufacturer, is empowered by manufacturer to inspect, approve, and operate their equipment and is authorized to make recommendations required to ensure equipment is complete and operational.

1.06 TRAINING

- A. General:
 - 1. Furnish manufacturers' representatives for detailed classroom and hands-on training to Owner's personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in individual Specifications.
 - 2. Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with Owner, and familiar with operation and maintenance manual information specified in Section 01 78 23 - Operation and Maintenance Data.

3. Manufacturer's representative shall be familiar with facility operation and maintenance requirements as well as with specified equipment.
 4. Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.
 5. Prepare training materials for 10 trainees total.
- B. Training Schedule:
1. Provide the Owner in coordination with the installation contractor with a 14 days' notice prior to training.
 2. Provide the specified minimum training on the equipment at no additional cost to the Owner.
 3. List specified equipment and systems that require training services and show:
 - a. Respective manufacturer.
 - b. Estimated dates for installation completion.
 - c. Estimated training dates.
 4. Allow for multiple sessions when several shifts are involved.
 - a. Adjust schedule to ensure training of appropriate personnel as deemed necessary by Owner, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.
 - b. Coordinate with Section 01 91 14 - Equipment Testing and Facility Startup.
- C. Lesson Plan: When manufacturer or vendor training of Owner personnel is specified, prepare a lesson plan for each required course containing the following minimum information:
1. Title and objectives.
 2. Recommended attendees: Engineers and operations and maintenance staff.
 3. Course description, outline of course content, and estimated class duration.
 4. Format (such as, lecture, self-study, demonstration, hands-on).
 5. Instruction materials and equipment requirements.
 6. Resumes of instructors providing training.
 7. The minimum manufacturer's training session content is outlined in Attachment A at the end of this section.
- D. Recording of Training Sessions:
1. Furnish audio and color recording of pre-startup and post-startup instruction sessions, including manufacturers' representatives' hands-on equipment instruction and classroom sessions.
 2. Video training DVDs, or .MOV or .MP4 files on USB shall be produced by a qualified, professional video production company.
 3. Use format suitable for playback on standard equipment available commercially in the United States. Blu-ray® DVD format is not acceptable without Owner's prior approval.
 4. Include one training session on each DVD or USB.
 5. Each DVD or USB shall contain an index identifying the area on the DVD or USB containing each major topic presented in the training session.

6. Furnish Owner with one set of DVDs or USBs of each session in draft form for review. Upon return of DVDs or USBs from Owner, incorporate Owner's comments and changes into final edited DVDs or USBs.
 7. Furnish Owner with three complete sets of final edited DVDs or USBs, fully indexed and cataloged with printed labels stating sessions and dates recorded.
 8. It is understood that Owner shall be under no restriction as to the use within Owner's facility of all training materials and video recorded training sessions received under this Contract.
- E. Time of Training Sessions: All training sessions shall be held on Mondays through Thursdays, in at least two separate time slots each day to accommodate all Owner's staff and all work shifts or as coordinated with the Owner on-site (the training sessions will not exceed what is outlined above). Training provided by Odor Control Bioscrubber Equipment Supplier shall maximize the training for all of the staff disciplines during staff working hours. The training shall be tailored to the needs of each discipline.
- F. Training Content:
1. Training materials are to be comprehensive, professional and shall be given to the Owner for the Owner's future use in training or retraining. Training materials and O&M manuals must include step by step instructions in the required maintenance procedures with reference to drawings using actual component ID numbers. The training materials shall include a table with required service, maintenance and inspection intervals. Training materials must also indicate the normal operating ranges for all parameters.
 2. In addition to any general training required by the General Specifications, the Odor Control Bioscrubber Equipment Supplier to provide the following training which shall be specific to this site and this equipment. All training documents shall be color, bound training manuals with color illustrations. Wherever possible, the manuals shall utilize pictures of equipment on this site and specific equipment numbers (such as valve B-502) to provide clarity and site specificity to the training materials. PowerPoint presentations shall also be assembled to illustrate the content of each of the manuals.
 3. The first training module shall include the Owner and first responder training:
 - a. Definition of common terms.
 - b. Properties of the fuel.
 - c. How does the Odor Control Bioscrubber system operate? This should include an illustration of the foul air and irrigation water flows through the system. This description should identify the isolation and venting points present for major components (tanks, fans, pumps, instruments, etc.).
 - d. Identify the safety risks and the required safety precautions (clothing, procedures, etc.)
 - e. Review the emergency response procedures. What to do in the case of fire, leak or venting.
 - f. How to make the system safe after an incident.

- g. When and where to evacuate to in the event of an incident.
 - h. Who and when to call to report an incident.
 - i. This training session is expected to require a minimum of 1 hours per session and shall be delivered to a minimum of 2 groups and may require delivery after normal working hours. These groups might include the Owner staff and contractors, and first responders. 10 copies of the training manual shall be provided.
- 4. The second module shall include the Owner or the Owner's Maintenance Contractor technical staff training:
 - a. Performance of daily and weekly inspections (log forms must be provided by the Odor Control Bioscrubber Supplier).
 - b. Routine maintenance, inspection and service requirements. Training shall include, but not be limited to: instrumentation calibration intervals and resources, media replacement, nutrient solution makeup, pump and valve lubrication, fan alignment, and other planned maintenance.
 - c. Safety procedures.
 - d. System operation overview.
 - e. Troubleshooting and debugging procedures.
 - f. This training session is expected to require a minimum of 3 hours per session and shall be delivered to a minimum of 2 groups and may require delivery after normal working hours. These groups might include the Owner's staff and contractors, and first responders. 10 copies of the training manual shall be provided.
 - g. All training manuals, presentations and documentation must be provided in reproducible & electronic form without copyright limitation, to allow the Owner to reproduce this information for the purpose of training additional maintenance staff or contractors.

1.07 SUPPLEMENTS

- A. The supplements listed below, following "End of Section," are part of this Specification.
 - 1. Manufacturer's Certificate of Proper Installation.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 43 33

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

OWNER: CITY OF TACOMA

EQPT SERIAL NO:

EQPT TAG NO:

EQPT/SYSTEM:

PROJECT NO:

SPEC. SECTION:

I hereby certify that the above-referenced equipment/system has been:
(Check Applicable)

- ☐ Installed in accordance with Manufacturer's recommendations.
- ☐ Inspected, checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ Functional tests.
- ☐ System has been performance tested and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.
Comments:

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate their equipment and (iii) authorized to make recommendations required to ensure equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____, 20____

Manufacturer: _____

By Manufacturer's Authorized/Certified Representative:
(Authorized Signature)

SECTION 01 45 33
SPECIAL INSPECTION, OBSERVATION, AND TESTING

PART 1 GENERAL

1.01 SUMMARY

- A. This section covers requirements for Special Inspection, Observation, and Testing required in accordance with Chapter 17 of the 2018 International Building Code and is in addition to and supplements requirements included in Special Inspection Schedule shown on Drawings.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. International Code Council (ICC):
 2. 2018 International Building Code (IBC).
 3. Evaluation Service (ICC-ES) Reports and Legacy Reports.
 4. American Society of Civil Engineers (ASCE): 7-10, Minimum Design Loads for Buildings and Other Structures.

1.03 DEFINITIONS

- A. Agencies and Personnel:
1. Approved Agency: An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved.
 2. Registered Design Professional in Responsible Charge: An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the Project is to be constructed.
 3. Special Inspector: Qualified person employed by Owner who will demonstrate competence to the satisfaction of the building official for inspection of a particular type of construction or operation requiring Special Inspection.
- B. Special Inspection:
1. Special Inspection and associated testing of shop fabrication and field construction will be performed by an approved credited independent agency. Owner will secure and pay for the services of the agency to perform Special Inspection and associated testing.
 2. Special Inspection: Inspection required of materials, installation, fabrication, erection, or placement of components and connections requiring special expertise to ensure compliance with approved Contract Documents and referenced standards.
 3. Special Inspection, Continuous: Full-time observation of work requiring Special Inspection by an approved Special Inspector who is present in the area where the Work is being performed.

4. Special Inspection, Periodic: Part-time or intermittent observation of work requiring Special Inspection by an approved Special Inspector who is present in the area where the Work has been or is being performed, and at the completion of the Work.
- C. Structural Systems and Components:
1. Drag Strut or Collector: Component of structural lateral load resisting system consisting of a diaphragm or shear wall element that collects and transfers diaphragm shear forces to vertical force-resisting elements or distributes forces within diaphragm or shear wall.
 2. Shear Wall: Component of structural lateral load resisting system consisting of a wall designed to resist lateral forces parallel to the plane of the wall.
 3. Wind Force Resisting System: That part of the structural system that has been considered in the design to provide required resistance to wind forces identified on Drawings.
- D. Nonstructural Components:
1. Electrical Component Supports: Structural members or assemblies which transmit loads and forces from electrical equipment to the structure, including braces, frames, legs, pedestals, and tethers, as well as elements forged or cast as part of component for anchorage.
 2. Mechanical Component Supports: Structural members or assemblies which transmit loads and forces from mechanical equipment to the structure, including braces, frames, skirts, legs, saddles, pedestals, snubbers, and tethers, as well as elements forged or cast as part of component for anchorage.
- E. Structural Observation:
1. Does not include or waive responsibility for required Special Inspection or inspections by building official.
 2. Structural Observation: Visual observation of structural system(s) by a registered design professional for general conformance to Contract Documents.

1.04 SUBMITTALS

- A. Informational Submittals:
1. Contractor's Statement of Responsibility: Form shall be completed by Contractor. Refer to Article Supplements located at end of section.
 2. Statement of mechanical and electrical components subject to special inspection and testing under IBC Section 1707 for seismic resistance.

1.05 SPECIAL INSPECTIONS (PLAN) REQUIREMENTS

- A. Statement of Special Inspections (Plan):
1. The following identifies elements of the inspection, observation, and testing program to be followed in construction of the Work:
 - a. Special Inspection and testing required by IBC Section 1704 and other applicable sections and referenced standards therein.

- b. Type and frequency of Special Inspection required.
 - c. Type and frequency of testing required.
 - d. Testing and Special Inspection reports shall be distributed by Special Inspector to Engineer, Contractor, building official, and Owner.
 - e. Structural Observations to be Performed: Structural Observation reports by registered design professional shall be distributed to Contractor, building official, and Owner.
- B. Special Inspection and associated testing of shop fabrication and field construction will be performed by an approved accredited independent agency. Owner will secure and pay for the services of the agency to perform Special Inspection and associated testing.
- C. Owner's plan for code required Special Inspection with associated testing and Professional Observation, as provided in Statement of Special Inspections (Plan) on Drawings and further provided in this section, is for the sole benefit of Owner and does not:
 - 1. Relieve Contractor of responsibility for providing adequate quality control measures.
 - 2. Relieve Contractor of responsibility for damage to or loss of material before acceptance.
 - 3. Constitute or imply acceptance.
 - 4. Affect continuing rights of Owner after acceptance of completed Work.
- D. The presence or absence of code required Special Inspector and Professional Observer does not relieve Contractor from Contract requirements.
- E. Contractor is responsible for additional costs associated with Special Inspection and Testing and Observation when Work is not ready at time identified by Contractor, and Special Inspectors and Professional Observer are on Site but not able to provide contracted services.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 GENERAL

- A. Provide access to shop or Site for Special Inspection and Testing and Professional Observation.
- B. Notify Owner in advance of required Special Inspection and Professional Observation no later than 48 hours prior to date of Special Inspection and Professional Observation.
- C. When required by Registered Design Professional, provide access for mechanical and electrical component inspections for those items requiring certification.
- D. Materials and systems, inclusive, shall be inspected during placement where Continuous Special Inspection is required.

- E. Materials and systems shall be inspected during or at completion of their placement where Periodic Special Inspection is allowed.
 - 1. Periodic Special Inspection shall be performed so that Work inspected after, but not during, its placement can be corrected prior to other related Work proceeding and covering inspected Work.
 - 2. Periodic Special Inspection does not allow sampling of a portion of the Work. All Work shall be inspected.

3.02 SUPPLEMENTS

- A. The supplement listed below, following "End of Section," is a part of this Specification:
 - 1. Contractor's Statement of Responsibility.

END OF SECTION 01 45 33

CONTRACTOR'S STATEMENT OF RESPONSIBILITY

(Project)

(Name of Contracting Company)

(Business Address)

(_____)_____
(Telephone)

(_____)_____
(Fax)

I, (We) hereby certify that I am (we are) aware of the Special Inspection and Testing and Professional Observation requirements contained in Contract Documents for this Project for flood and groundwater, force-resisting systems, as listed in the Statement of Special Inspections (Plan) on Drawings.

1. Control of this Work will be exercised to obtain conformance with the Contract Documents approved by the building official.
2. Procedures to be used for exercising control of the Work, the method and frequency of reporting, and distribution of reports required under the Statement of Special Inspections (Plan) for this Project are attached.
3. I, (We) will provide 72-hour notification to Owner and approved agency as required for structural tests and Special Inspection for this Project.
4. The following person is hereby identified as exercising control over the requirements of this section for the Work designated above:

Name:_____

Qualifications:_____

(Print name and official title of person signing this form)

Signed by:_____

Date:_____

Project Name: _____

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Mobilization, furnishing, maintaining, and removing construction facilities and temporary controls, including temporary utilities, construction aids, barriers and enclosures, security, access roads, temporary controls, project sign, storage and laydown areas, field offices and sheds, and removal after construction.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
 - 2. Temporary Construction Submittals:
 - a. Fencing and protective barrier locations and details.

1.03 MOBILIZATION

- A. Mobilization includes, but is not limited to, these principal items:
 - 1. Obtaining required construction permits
 - a. City will pay for building permit per General and Supplementary Conditions
 - b. Contractor shall obtain and pay for electrical permit.
 - 2. Moving Contractor's field office and equipment required for first month operations onto Site.
 - 3. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.
 - 4. Arranging for and erection of Contractor's work and storage yard.
 - 5. Posting OSHA required notices and establishing safety programs and procedures.
 - 6. Having Contractor's superintendent at Site full time.
- B. Use area designated for Contractor's temporary facilities as directed by Owner.

1.09 TEMPORARY UTILITIES

- A. Contractor's Field Office
 - 1. Contractor's field office shall be provided at Contractor's discretion, but if provided, shall be no larger than 24 feet by 10 feet.
 - 2. Locate field office at Wastewater Treatment Plant Site, within plant fence, where indicated by the Owner.
 - 3. Contractor shall provide their own security for field office and comply with other provisions in this Section.

- B. Temporary electrical power:
 - 1. Connect to the Owner's existing electrical service with a service disconnect switch to provide adequate temporary electrical service for Contractor's trailer.
 - 2. Contractor shall provide overcurrent and ground fault protection.
- C. Temporary electrical lighting:
 - 1. In work areas, provide temporary lighting sufficient to maintain lighting levels during working hours not less than lighting levels required by OSHA and state agency which administers OSHA regulations where Project is located.
- D. Temporary heating, cooling, and ventilating:
 - 1. Heat and ventilate work areas to protect the Work from damage by freezing, high temperatures, weather, and to provide safe environment for workers.
- E. Temporary water:
 - 1. Pay for and construct facilities necessary to connect to Owner's existing potable water service.
 - 2. Contractor shall provide an approved backflow prevention device.
- F. Temporary sanitary facilities:
 - 1. Provide and maintain self-contained portable sanitary facilities for the Contractor's and subcontractor's use. Facilities shall be serviced, cleaned and disinfected frequently. The Owner's existing sanitary facilities shall not be available for Contractor's use.
 - 2. Provide suitable and adequate sanitary facilities that are in compliance with applicable Laws and Regulations.
 - 3. At completion of the Work, remove sanitary facilities and leave site in neat and sanitary condition.
- G. Temporary telephone:
 - 1. Provide temporary telephone service and high-speed internet service for the Contractor's use.
- H. Temporary Fire Protection:
 - 1. Provide and maintain fire protection equipment, including extinguishers, fire hoses, and other equipment required by law, insurance carriers, or necessary for proper fire protection during the course of the work.
 - 2. Use fire protection equipment only for fighting fires.
 - 3. Locate fire extinguishers in field offices (if provided by Contractor), storage sheds, tool houses, temporary buildings, and throughout the construction site.
- I. First aid:
 - 1. Post first aid facilities and information posters conforming to requirements of OSHA and other applicable Laws and Regulations in readily accessible locations.

1.10 CONSTRUCTION AIDS

- A. Provide railings, kick plates, enclosures, safety devices, and controls required by Laws and Regulations and as required for adequate protection of life and property.
- B. Use construction hoists, elevators, scaffolds, stages, shoring, and similar temporary facilities of ample size and capacity to adequately support and move loads.
- C. Accident prevention:
 - 1. Exercise precautions throughout construction for protection of persons and property.
 - 2. Observe safety provisions of applicable Laws and Regulations.
 - 3. Guard machinery and equipment and eliminate other hazards.
 - 4. Make reports required by authorities having jurisdiction, and permit safety inspections of the Work.
 - 5. Before commencing construction work, take necessary action to comply with provisions for safety and accident prevention.
- D. Barricades:
 - 1. Place barriers at ends of excavations and along excavations to warn pedestrian and vehicular traffic of excavations.
 - 2. Provide barriers with flashing lights after dark.
 - 3. Keep barriers in place until excavations are entirely backfilled and compacted.
 - 4. Barricade excavations to prevent persons from entering excavated areas in streets, roadways, parking lots, treatment plants, or other public or private areas.
- E. Warning devices and barricades: Adequately identify and guard hazardous areas and conditions by visual warning devices and, where necessary, physical barriers:
 - 1. Devices shall conform to minimum requirements of OSHA and State agency which administers OSHA regulations where Project is located.

1.11 ACCESS ROADS

- A. Traffic Control Plan: Not required unless Contractor strays from Owner's designated access routes for Contractor ingress and egress.
- B. On-site access roads: As shown in the Drawings:
 - 1. Maintain access roads to delivery areas, storage areas, and other areas to which frequent access is required daily.
 - 2. Maintain similar roads to existing facilities on site of the Work to provide access for maintenance and operation daily.
 - 3. Protect buried vulnerable utilities under temporary roads with steel plates, wood planking, or bridges.

4. Maintain on-site access roads free of mud and debris in accordance with the Contractor's Construction Stormwater Pollution Prevention Plan (SWPPP). Under no circumstances shall vehicles leaving the site track mud off the site onto the public right-of-way.

1.12 PROTECTION OF WORK AND PROPERTY

A. General:

1. Comply with Owner's safety rules while on Owner's property, in addition to Contractor's health and safety plan.
2. Keep Owner informed of serious onsite accidents and related claims.
3. Use of Explosives: No blasting or use of explosives will be allowed onsite.
4. Public street closures are not allowed or believed necessary as part of this Work.
5. Maintain in continuous service underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and other utilities encountered along line of the Work, unless other arrangements satisfactory to Owner have been made.
6. Where completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate activities with Owner and perform work to Owner's satisfaction.
7. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
8. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
9. In areas where Contractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Contractor.
10. Notify Owner at least 3 days in advance: Before exposing a utility, obtain Owner's permission. Should service of utility be interrupted due to Contractor's operation, notify Owner immediately. Cooperate with Owner in restoring service as promptly as possible and bear costs incurred.
11. Do not impair operation of existing sewer system. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes, and other debris from entering sewers, pump stations, or other sewer structures.
12. Maintain original Site drainage wherever possible.

B. Signs and Equipment:

1. Provide at obstructions, such as material piles and equipment.
2. Use to alert plant staff of construction hazards, which would include surface irregularities, unramped walkways, and grade changes in accessible areas.

1.13 TEMPORARY CONTROLS

- A. Air Pollution Control:
 - 1. Minimize air pollution from construction operations.
 - 2. Burning of waste materials, rubbish, or other debris is not permitted on or adjacent to Site.
 - 3. Provide and maintain temporary dust-tight partitions, bulkheads, or other protective devices during construction to permit normal operation of existing facilities. Construct partitions of plywood, insulating board, plastic sheets, or similar material. Construct partitions in such a manner that dust and dirt from demolition and cutting will not enter other parts of existing building or facilities. Remove temporary partitions as soon as need no longer exists.
- B. Noise control:
 - 1. Comply with City of Tacoma Noise Ordinance (TMC 8.122) limiting construction noise levels. Use whisper-quiet air compressors. Use jack hammers with exhaust mufflers. Prevent noise disturbance to the public and adjacent property owners. See Section 01 14 00 for work hours and noise variance permit requirements.

1.14 STORAGE YARDS

- A. Store all materials in designated locations determined by owner. Material shall be stored in accordance with manufacturers recommendations.

1.15 CONTRACTORS FILED OFFICE

- A. Locate in the staging area shown on the Drawings and as approved by the Owner.

1.16 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.
- B. Use area designated by Owner for parking of Contractor's and Contractor's employees' vehicles.
- C. Provide tags or marked vehicles identifying Contractor's and Contractor's employee's vehicle.

1.17 VEHICULAR TRAFFIC

- A. Conduct the Work to interfere as little as possible with travel, whether vehicular or pedestrian.
- B. Conduct operations with the least interference to fire equipment and sludge hauling truck access, and at no time prevent such access. Furnish Contractor's night emergency telephone numbers to Owner.

- C. Sludge Hauling at NETP occurs on average 5 times per weekday by double tanker truck that drives in a counterclockwise route through the NETP loop road. Sludge loading from the sludge loading station is for a duration of 5 to 10 minutes, after which the tanker truck leaves passing north of the solids contact tank and administration building.

1.18 CLEANING DURING CONSTRUCTION

- A. As may be specified in other Specification sections, and as required herein.
- B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris. At least weekly, sweep floor slabs and pick up and dispose of debris.
- C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least weekly, dispose of such waste materials, debris, and rubbish offsite.
- D. At least weekly, brush sweep entry drive, roadways, and other streets and walkways affected by the Work and where adjacent to the Work.

1.19 REMOVAL

- A. Remove temporary buildings and furnishings before inspection for Physical Completion or when directed.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Remove underground installations to minimum depth of 24 inches and grade to match surrounding conditions.
- D. Restore existing facilities used during construction to specified or original condition.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 50 00

**SECTION 01 61 00
COMMON PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 DEFINITIONS

- A. Products:
 - 1. New items for incorporation in the Work, purchased by Contractor 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, package, subsystem, system, hardware, software, and terms of similar intent and is not intended to change meaning of such other terms used in Contract Documents, as those terms are self-explanatory and have well recognized meanings in construction industry.
 - 3. Items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of the date of the Contract Documents.

1.02 DESIGN REQUIREMENTS

- A. Where Contractor design is specified, design of installation, systems, equipment, and components, including supports and anchorage, shall be in accordance with provisions of latest edition of International Building Code (IBC) by International Code Council, as amended by the State of Washington, the City of Tacoma, and all other applicable local agencies. Wind, snow and seismic criteria are as shown on the Drawings.
- B. Submit Shop Drawings and calculations for all Contractor-designed work, stamped by a professional engineer registered in the State of Washington.

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at 25 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 5 degrees F to 105 degrees F.

1.04 PRODUCT REQUIREMENTS

- A. Comply with Specifications and referenced standards as minimum requirements.
- B. Provide products by same manufacturer when products are of similar nature, unless otherwise specified.
- C. Provide identical products when products are required in quantity.

- D. Provide products with interchangeable parts whenever possible.
- E. Require each equipment manufacturer to have maintenance facilities meeting the following requirements:
 - 1. Minimum 3 years operational experience.
 - 2. Location in continental United States.
 - 3. Equipment and tools capable of making repairs.
 - 4. Staff qualified to make repairs.
 - 5. Inventory of maintenance spare parts.

1.05 CONTRACTOR PREPARATION FOR SHIPMENT

- A. When practical, factory assemble products. Mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with 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, contents by name, name of Project and Contractor, equipment number, and approximate weight. Include complete packing list and bill of materials with each shipment.
- C. Extra Materials, Special Tools, Test Equipment, and Expendables:
 - 1. Furnish as required by individual Specifications.
 - 2. Schedule:
 - a. Ensure that shipment and delivery occurs concurrent with shipment of associated equipment.
 - b. Transfer to Owner via signature by Owner shall occur immediately subsequent to Contractor's acceptance of equipment from Supplier.
 - 3. Packaging and Shipment:
 - a. Package and ship extra materials and special tools to avoid damage during long term storage in original cartons insofar as possible, or in appropriately sized, hinged-cover, wood, plastic, or metal box.
 - b. Prominently displayed on each package, the following:
 - 1) Manufacturer's part nomenclature and number, consistent with Operation and Maintenance Manual identification system.
 - 2) Applicable equipment description.
 - 3) Quantity of parts in package.
 - 4) Equipment manufacturer.
 - 4. Deliver materials to Site.
 - 5. Notify Owner upon arrival for transfer of materials from Contractor to Owner.
 - 6. Replace extra materials and special tools found to be damaged or otherwise inoperable at time of transfer to Owner.

- D. Request a minimum 7-day advance notice of shipment from manufacturer. Upon receipt of manufacturer's advance notice of shipment, promptly notify Owner of anticipated date and place of equipment arrival.
- E. Factory Test Results: Reviewed and accepted by Owner and Engineer before product shipment as required in individual Specification sections.

1.06 DELIVERY AND INSPECTION

- A. Deliver products in accordance with accepted current Progress Schedule and coordinate to avoid conflict with the Work and conditions at 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, date of manufacture and shelf life, where applicable.
- C. Unload products in accordance with manufacturer's instructions for unloading or as specified. Record receipt of products at Site. Promptly inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from Site and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

1.07 HANDLING, STORAGE, AND PROTECTION

- A. Handle and store products in accordance with manufacturer's written instructions and in a manner to prevent damage. Store in approved storage yards or sheds provided in accordance with Section 01 50 00 - Temporary Facilities and Controls. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.
- B. Manufacturer's instructions for material requiring special handling, storage, or protection shall be provided prior to delivery of material.
- C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to ensure 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.
- D. Store electrical, instrumentation, and control products, and equipment with bearings in weather-tight structures maintained above 60 degrees F. Protect electrical, instrumentation, and control products, and insulate against moisture, water, and dust damage. Connect and operate continuously space heaters furnished in electrical equipment.

- E. Store fabricated products above ground on blocking or skids and prevent soiling or staining. Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
- F. Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.
- G. After installation, provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.
- H. Hazardous Materials: Prevent contamination of personnel, storage area, and Site. Meet requirements of product specification, 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. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 - 1. "Or-Equal" Items: If in the Owner's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Owner as an "or-equal" item. A proposed item of material or equipment will be considered functionally equal to an item so named if in the exercise of reasonable judgment Owner determines that:
 - 1) It is equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) It will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) It has a proven record of performance and availability of responsive service; and

2. Contractor certifies that, if approved and incorporated into the Work:
 - 1) There will be no increase in cost to the Owner or increase in Contract Times, and
 - 2) It will conform to the detailed requirements of the item named in the Contract Documents.
 3. The Contractor assumes all monetary liability with regard to substitutions regardless of the Engineer's acceptance.
- D. Approved 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, manufacturer's services, and implement same or similar process instrumentation and control functions in same or similar manner. The Contractor assumes all monetary liability with regard to substitutions regardless of the Owner's acceptance.
- E. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- F. Provide interchangeable components of the same manufacturer, for similar components, unless otherwise specified.
- G. Equipment, Components, Systems, and Subsystems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OSHA, state, and local health and safety regulations.
- H. Regulatory Requirement: Coating materials shall meet federal, state, and local requirements limiting the emission of volatile organic compounds and for worker exposure.
- I. 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; stainless steel, aluminum coated steel, or aluminum coated 1/2-inch mesh expanded steel. Provide stainless steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water.
- J. Authority Having Jurisdiction (AHJ):
1. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval under NEC.
 2. Materials and equipment manufactured within the scope of standards published by Underwriters Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark.

- K. 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 gray finish as approved by Owner.
- L. Special Tools and Accessories: Furnish to Owner, upon acceptance of equipment, all specified and furnished accessories required to place each item of equipment in full operation. These accessory items include, but are not limited to, valve keys, handwheels, special tools, and other spare parts as required for maintenance.

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 manufactured structural members for anticipated shock and vibratory loads.
 - 4. Modify standard products as necessary to meet performance Specifications.

2.03 SOURCE QUALITY CONTROL

- A. Where Specifications call for factory testing to be witnessed by Owner or Engineer, notify Owner not less than 14 days prior to scheduled test date, unless otherwise specified.
- B. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous 12 months to a standard endorsed by the National Institute of Standards and Technology (NIST).

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 material 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 material or equipment damage that necessitates procurement of new products will be considered delays within Contractor's control.

3.02 INSTALLATION

- A. Equipment Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.

- B. No shimming between machined surfaces is allowed. Level the equipment being installed by shimming and grouting the equipment mounting base to the structure, not by shimming between pieces of the equipment that are mounted to the base. Use qualified personnel to perform the work.
- C. Install the Work in accordance with NECA Standard of Installation, unless otherwise specified.
- D. Repaint painted surfaces that are damaged prior to equipment acceptance.
- E. Do not cut or notch any structural member or building surface unless shown on the plans or have received approval from Owner.
- F. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions, and as may be specified. Retain a copy of manufacturers' instruction at Site, available for review at all times.
- G. 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 offsite storage, restoration, or renovation. Include costs for such Work in the Contract Price.

3.03 ADJUSTMENT AND CLEANING

- A. Perform required adjustments, tests, operation checks, and other startup activities.

END OF SECTION 01 61 00

SECTION 01 73 00 CUTTING AND PATCHING

PART 1 GENERAL

1.01 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Specification Sections include but are not necessarily limited to
 - 1. Division 1 – General Requirements.

1.02 DEFINITIONS

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.03 SUBMITTALS

- A. See Specification Section 01 33 00 – Submittal & RFI Procedures for submittal requirements.
- B. Cutting and Patching Proposal: Submit a proposal describing procedures at least 14 days before the time cutting and patching will be performed.
 - 1. Cutting and patching of structural elements, operating elements, elements where existing warranties may be impacted, and elements which will be altered aesthetically always require a written proposal whether or not specifically requested by the City. Request acceptance to proceed.
 - 2. Obtain prior approval from City when any opening larger than 25 SQ IN must be made in existing or newly completed construction.
 - 3. Include the following information in the Cutting and Patching Proposal:
 - a. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - b. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - c. Products: List products to be used and firms or entities that will perform the Work.
 - d. Dates: Indicate when cutting and patching will be performed.
 - e. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.

- f. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and Licensed Professional engineering Stamped calculations showing integration of reinforcement with original structure.
- g. City's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.04 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Structural steel.
 - e. Miscellaneous structural metals.
 - f. Equipment supports.
- B. Operational Elements: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment.
 - b. Water, moisture, or vapor barriers.
 - c. Fire protection systems.
 - d. Control systems.
 - e. Communication systems.
 - f. Electrical wiring systems.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 - 1. Water, moisture, or vapor barriers.
 - 2. Membranes and flashings.
 - 3. Exterior curtain-wall construction.
 - 4. Equipment supports.
 - 5. Piping and equipment.
 - 6. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would visually appear to be constructed in an unsatisfactory manner.

- E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including City and mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.05 WARRANTY

- A. Contractor warrants that all work conforms to the requirements of the Contract Documents and is free of any defect in equipment, material, or workmanship performed by the Contractor for 1 year after the date of fabrication.
- B. Special warranty provisions shall apply where specified.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials or as shown on plans. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials as accepted by City.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting, and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Temporary Support: Provide temporary support where required to complete the Work.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to occupied areas.

3.03 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
 - 2. Fit the Work to be air-tight against pipes, sleeves, ducts, conduits, and other surface penetrations unless indicated otherwise in the Contract Documents, and unless prohibited by code, rule or regulation.
 - 3. Employ qualified installer or fabricator to perform cutting, fitting and patching of the following surfaces:
 - a. Weather-exposed or moisture-resistant surfaces.
 - b. Sight-exposed finished surfaces.
 - 4. Maintain original fire-resistant ratings through the application of approved penetrations.
 - 5. Where patching occurs, refinish entire contiguous surface to match adjacent Work as follows.
 - a. Continuous surfaces: Refinish to nearest intersection, joint, corner, edge and/or gap OR as approved by the Owner.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. Require subcontractors for new construction, and fabrication of new work items, to provide all necessary holes, penetrations and cutting in the subcontracts.
 - 2. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 3. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 4. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 5. Maintain adequate temporary support necessary to assure structural integrity of affected property and/or Work.
 - 6. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 7. Proceed with patching after construction operations requiring cutting are complete.

- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
 - 1. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing as practical.

3.04 CLEANING

- A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- B. Including work of other sections, clean, repair, and touchup products which have been soiled, discolored, or damaged by Work of this Section.
- C. Remove debris from Project Site at weekly intervals, and when cutting, fitting and patching in the affected area is concluded.

END OF SECTION 01 73 00

SECTION 01 74 00 CLEANING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Intermediate and final cleaning of Work.

1.02 STORAGE AND HANDLING

- A. Store cleaning products and cleaning wastes in containers specifically designed for those materials.

1.03 SCHEDULING

- A. Schedule cleaning operations so that dust and other contaminants disturbed by cleaning process will not fall on newly painted surfaces.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Cleaning Agents:
 - 1. Compatible with surface being cleaned.
 - 2. New and uncontaminated.
 - 3. For Manufactured Surfaces: Material recommended by manufacturer.

PART 3 EXECUTION

3.01 CLEANING - GENERAL

- A. Prevent accumulation of wastes that create hazardous conditions and clean up daily.
- B. Conduct cleaning and disposal operations to comply with laws and safety orders of governing authorities.
- C. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains or sewers.
- D. Dispose of degradable debris at an approved solid waste disposal site.
- E. Dispose of non-degradable debris at an approved solid waste disposal site or in an alternate manner approved by Engineer and regulatory agencies.
- F. Handle materials in a controlled manner with as few handlings as possible.
- G. Do not drop or throw materials from heights greater than 4 FT or less than 4 FT if conditions warrant greater care.

- H. On completion of work, leave area in a clean, natural looking condition.
 - 1. Remove all signs of temporary construction and activities incidental to construction of required permanent Work.
- I. Do not burn on-site.

3.02 INTERIOR CLEANING

- A. Cleaning During Construction
 - 1. Construction Debris inside Solids Holding Tank:
 - a. Provide debris catcher or other means to prevent any debris from entering the Solids Holding Tank
 - 2. Material deposited inside Chlorine Contact Basin:
 - a. Prevent debris from entering disinfection contact basin
 - b. Notify operators of work taking place above disinfection contact basin
 - c. If debris or rubbish enters disinfection contact basin, immediately notify and seek plant operator instructions for means of removal. Comply with Owner directed removal instructions.
 - 3. Keep all electrical panels and wireways clean of insulation waste and other debris.

3.03 EXTERIOR (SITE) CLEANING

- A. Cleaning During Construction:
 - 1. Construction debris:
 - a. Confine in strategically located container(s):
 - 1) Cover to prevent blowing by wind.
 - 2) Haul from site minimum once a week.
 - b. Remove from work area to container daily.
 - 2. Soils, sand, and gravel deposited on paved areas and walks:
 - a. Remove as required to prevent muddy or dusty conditions.
 - b. Do not flush into storm sewer system.
 - c. Provide street sweeping services.
- B. Final Cleaning:
 - 1. Remove trash and debris containers from site.
 - 2. Remove stains, petrol-chemical spills, and other foreign deposits.

END OF SECTION 01 74 00

**SECTION 01 74 10
CONSTRUCTION WASTE MANAGEMENT**

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Supplemental Conditions as Modified by the City of Tacoma and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes:
 - 1. Description of a Job-Site Construction Waste Management Plan.
 - 2. Job-Site Waste Reduction Requirements.
- B. Related Sections:
 - 1. 01 33 00 – Submittal & RFI Procedures.
 - 2. 01 74 00 – Cleaning.
- C. Job Site Waste Reduction Requirements.
 - 1. Divert through reuse and/or recycle at least ninety (90) percent of all Construction, demolition, and land clearing debris (CDL) waste generated. Calculations may be based on dry weight or volume but must be consistent throughout.
 - 2. To achieve these goals the Contractor shall develop for review a Waste Management Plan and provide a monthly implementation success reports for this Project.

1.03 RESOURCES & REFERENCES

- A. Comply with requirements of Section 01 42 00 – References; and as listed herein. The following is a list of standards referenced in this Section:
- B. The following list of resources is available to the Contractor to assist in compliance with the requirements of the Waste Management Plan.
 - 1. City of Tacoma, Solid Waste Division (253) 407-6352
 - 2. Resource Venture: A guidebook on waste prevention in construction from the Business and Industry Resource Venture may be used. <http://resourceventure.org/free-resources/get-started>
 - 3. The “Recycling Plus Program Manual” published by the Washington State Clean Washington Center can be used to develop a job site reduction program.

1.04 DEFINITIONS

- A. Daily Cover: Soil, or approved material utilized to isolate MSW excavations from exposure to degradation due to weather, natural forces, surface water contamination, water saturation and other effects; and to minimize noxious effects including but not limited to rodent populations, odors, dangers to health and property, and public concerns.
- B. Waste: Any material that has reached the end of its intended use. Waste includes salvageable, returnable, recyclable and reusable construction materials that would otherwise be discarded or destroyed.
- C. Trash (or Garbage): That part of the waste that cannot be returned, reused, recycled, or salvaged.
- D. Construction, Demolition, and Land clearing Waste (CDL): All non-hazardous solid wastes resulting from construction, demolition, and land clearing activities. CDL waste includes, but is not limited to, building materials, demolition rubble, landscaping materials, soils, packaging materials, debris, and trash.
- E. Construction Waste: Solid wastes including, but not limited to, building materials, packaging materials, debris and trash resulting from construction operations.
- F. Proper Disposal: As defined by the jurisdiction receiving the waste.
- G. Landfill: Public or private business involved in the practice of trash disposal.
- H. Hazardous Waste: Any material or byproduct of construction that is regulated by Environmental Protection Agency and that may not be disposed in landfill or other waste end-source without adherence to applicable laws.
- I. Municipal Solid Waste (MSW): more commonly known as trash or garbage, consist of everyday items such as product packaging, grass clippings, furniture, clothing, bottles, newspapers, appliances, paint, and batteries.
- J. Recycling: The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product. Can be conducted on site (as in the grinding of concrete and reuse on site).
- K. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of a new product. Recycling facilities have their own specifications for accepting materials. Depending on the type of facility, it may accept source-separated waste or co-mingled waste or both.

- L. Recycling Services. Types of services include:
 - 1. Source-Separated: Construction waste is sorted on the job-site in separate containers as it is generated. The recycling hauler takes the materials directly to a recycler or a transfer site.
 - 2. Co-mingled: This service allows contractors to put select recyclables such as wood, cardboard, and metals in one (1) container. The recycling hauler takes the materials to a sorting facility where the materials are separated for recycling.
- M. Reuse: Making use of a material without altering its form.
- N. Salvage: Recovery of materials for on-site reuse or donation to a third party.
- O. Source-separated Materials: Materials that are sorted at the site for the purpose of reuse or recycling.
- P. Co-mingled Materials: Mixed recyclable CDL material that has not been source-separated. Some facilities will separate co-mingled materials off-site for recycling.
- Q. Waste Management Plan: A Project-related plan for the collection, transportation, and disposal of the waste generated at the construction site.

1.05 SUBMITTALS

- A. General: Submit the following in accordance with the Conditions of the Contract and 01 33 00 – Submittal & RFI Procedures.
- B. Within fourteen (14) days after receipt of Notice to Proceed and prior to any waste removal by the Contractor from the Project, the Contractor shall develop and submit to the City for review a Construction Waste Management Plan. Include the following minimum information:
 - 1. Types and estimated quantities of recycled materials that are expected to be generated during demolition. Values may be reported based on dry weight or volume, but must be consistent throughout. Estimate of total weight by tons or pounds of each waste category to be diverted from landfill, or total volume, in cu.yds.
 - 2. Types and estimated quantities (where reasonably available) of recyclable materials expected to be generated during construction in significant amounts including but not limited to wood, concrete, metals, cardboard, and drywall. Calculations may be based on weight or volume, but must be consistent throughout.
 - 3. Describe method of handling all recyclable materials.
 - 4. Types and estimated quantities (where reasonably available) of recyclable materials expected to be generated during construction in significant amounts including but not limited to wood, concrete, metals, cardboard, and drywall. Calculations may be based on weight or volume, but must be consistent throughout.

5. Disposed Materials: List hazardous material waste and disposal separately.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

1.06 WASTE MANAGEMENT PLAN PERFORMANCE REQUIREMENTS

- A. At a minimum, the waste management plan shall be designed to divert the following waste categories from the landfill.
 1. Land-clearing debris
 2. Asphalt paving
 3. Cardboard, including from supplies and packaging.
 4. Concrete and concrete masonry units (CMU's).
 5. Excavated soils, EXCEPT clean soil acceptable as daily cover.
 6. Metals including all metals from banding, stud trim, ductwork, piping, rebar, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
 7. Paint.
 8. Plastic film; sheeting, shrink wrap, packaging.
 9. Plywood, OSB, particleboard
 10. Clean dimensional wood, pallet wood
- B. Measurement: Weight of Material, dry, in pounds or tons, or volume, in cu. yds. Only one method must be used.
- C. Documentation: The Contractor shall provide at a minimum the following information in the Construction Waste Management Plan:
 1. Types and estimated quantities of recyclable materials that are expected to be generated during demolition. Values may be reported based on dry weight or volume but must be consistent throughout. Estimate of total weight by tons or pounds of each waste category to be diverted from landfill, or total volume, in cu.yds.
 2. Types and estimated quantities (where reasonably available) of recyclable materials expected to be generated during construction in significant amounts including but not limited to wood, concrete, metals, cardboard, and drywall. Calculations may be based on weight or volume but must be consistent throughout.
 3. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility. List hazardous material waste and disposal separately.
- D. Transportation: Include the names for each subcontractor that will transport solid or hazardous waste from the site and the name of the receiving facility that will accept waste for disposal.

1.07 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.08 FEES & REVENUES

- A. Revenue or Savings obtained from recycled materials shall accrue to Contractor unless otherwise noted in the contract documents.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 IMPLEMENTATION

- A. Implement waste management plan as approved by City. Unless otherwise noted, provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract. Comply with the following procedures:
 - 1. Define specific areas to facilitate separation of materials for recycling, salvage, reuse or return.
 - 2. Separate construction waste by type at Project site to the maximum extent practical.
 - 3. Recycle and waste bin areas are to be maintained in an orderly manner and clearly marked to avoid contamination of materials. Inspect containers and bins weekly for contamination and remove contaminated materials if found.
 - 4. Drop-off boxes shall be protected during non-working hours from off-site contamination.
 - 5. Store components off the ground and protect from weather.
- B. Hazardous Wastes: Store in secure areas and comply with the following:
 - 1. Hazardous wastes shall be separated, stored and disposed of in accordance with local and EPA regulations and additional criteria listed below:
 - a. Building products manufactured with PVC or containing chlorinated compounds shall not be incinerated.
 - b. Disposal of fluorescent tubes to open containers is not permitted.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

- D. The Contractor shall provide all equipment, personnel, and materials necessary to load, transport and dispose of waste materials, including contaminated soils and debris, for off-site treatment or disposal in accordance with Federal, Washington State and local regulations.
 - 1. Contractor shall provide documentation of legal disposition including trip tickets and Certificates of Disposal of all waste treated or disposed of off-site by the Contractor.

3.02 COMMUNICATION

- A. Distribute copies of the Construction Waste Management Plan to each entity performing work at the site.
- B. Use safety meetings, signage, and subcontractor agreements to communicate the goals of the waste reduction plan, including instruction about appropriate separation, handling separation, handling, and recycling,, reuse and return methods to be used by all parties at the appropriate stages of the Project.

3.03 MATERIALS CONSERVATION

- A. Protect products from damage during storage, installation, and in-place. Materials that become wet or damp due to improper storage shall be replaced at contractor's expense.
- B. Use construction methods that reduce construction waste. To the greatest extent possible, do the following:
 - 1. Order materials precut to required size.
 - 2. Order exact quantity required.
 - 3. Use temporary materials and facilities that will be reused at other projects.

END OF SECTION 01 74 10

**SECTION 01 77 00
CLOSEOUT PROCEDURES**

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: Contract closeout requirements including:
 - 1. Final cleaning.
 - 2. Waste disposal.
 - 3. Touch-up and repair.
 - 4. Preparation and submittal of closeout documents.
 - 5. Certificate of Substantial Completion.
 - 6. Warranties

1.02 REFERENCES (Not Used)

1.03 FINAL CLEANING

- A. Perform final cleaning prior to inspections for Physical Completion as defined in General and Supplementary Conditions 00_72_00 and 00_73_00.
- B. Employ skilled workers who are experienced in cleaning operations.
- C. Use cleaning materials which are recommended by manufacturers of surfaces to be cleaned.
- D. Prevent scratching, discoloring, and otherwise damaging surfaces being cleaned.
- E. Clean grease, mastic, adhesives, dust, dirt, stains, fingerprints, paint, blemishes, sealants, plaster, concrete, and other foreign materials from sight-exposed surfaces, and fixtures and equipment.
- F. Remove non-permanent protection and labels.
- G. Removal all debris and construction materials.
- H. Patch any holes, chips or defects in construction including finished surfaces.
- I. Touch up painted surfaces that are soiled, chipped or otherwise flawed.

1.04 WASTE DISPOSAL

- A. Arrange for and properly dispose of surplus materials, waste products, and debris off-site.

1.05 TOUCH-UP AND REPAIR

- A. Touch-up or repair finished surfaces on structures, equipment, fixtures, and installations that have been damaged prior to inspection for Physical Acceptance. Owner will repaint equipment or patched portions of painted or coated surfaces following repair of finished surfaces by Contractor allowing for uniform texture to entire surface.
- B. Refinish or replace entire surfaces which cannot be touched-up or repaired satisfactorily.

1.06 PROJECT RECORD DOCUMENTS

- A. Maintain at Project site and update weekly, available to Owner and Engineer, one consolidated hard copy of the Contract Documents, shop drawings, and other submittals in good order:
 - 1. Mark and record field changes and detailed information contained in submittals and change orders in accordance with Owner standards.
 - 2. Record actual depths, horizontal and vertical location of underground pipes, duct banks, and other buried utilities. Reference dimensions to permanent surface features.
 - 3. Identify specific details of conduit connections, location of existing buried features located during excavation, and the final locations of piping, equipment, electrical conduits, manholes, and pull boxes.
 - 4. Identify location of spare conduits including beginning, ending, and routing through pull boxes and manholes. Record spare conductors, including number and size, within spare conduits and filled conduits.
 - 5. Identify the final installed equipment and instrument tags.
 - 6. Provide schedules, lists, layout drawings, and wiring diagrams.
 - 7. Make annotations with erasable colored pencil conforming to the following color code:

Additions:	Red
Deletions:	Green
Comments	Blue
Dimensions:	Graphite

- B. Maintain documents separate from those used for construction:
 - 1. Label documents "RECORD DOCUMENTS."
- C. Keep documents current:
 - 1. Provide photographic records with required information at the time the material and equipment is installed and before permanently concealing.

- D. Deliver record documents with transmittal letter containing date, Project title, Contractor's name and address, list of documents, and signature of Contractor. Provide both electronically and on CD.
- E. During progress meetings, record documents will be reviewed to ascertain that changes have been recorded.

1.07 MAINTENANCE SERVICE

- A. Maintenance service as specified in technical specifications.

1.08 SUBSTANTIAL COMPLETION

- A. In accordance with General and Supplementary Conditions 00_72_00 and 00_73_00, Section 6.07.
- B. In accordance with Section 01_14_00 - Work Restrictions.
- C. Submit AIA Document G704 Substantial Completion Certificate.

1.09 PHYSICAL COMPLETION

- A. In accordance with General and Supplementary Conditions 00_72_00 and 00_73_00, Section 6.09.
- B. When Contractor considers the Work is complete, submit written certification that:
 - 1. Work has been completed in accordance with the Contract Document.
 - 2. Punch list items have been completed or corrected.
 - 3. Work is ready for final inspection.
- C. Engineer and Owner will make an inspection to verify the status of completion with reasonable promptness.
- D. Should the Owner consider that the Work is incomplete or defective:
 - 1. Owner will promptly notify the Contractor in writing, listing the incomplete or defective work.
 - 2. Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to the Owner that the Work is complete.
 - 3. Engineer and Owner shall re-inspect the Work.

1.10 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the Owner at least seven days prior to final Application for Payment.

- B. Statement shall reflect all adjustments to the Contract amount:
 - 1. The original Contract amount.
 - 2. Additions and deductions resulting from:
 - a. Change Orders.
 - b. Set-offs for uncorrected or incomplete Work.
 - c. Set-offs for liquidated damages.
 - d. Set-offs for reinspection payments.
 - e. Extended engineering and/or inspection services and inspection overtime.
 - f. Excessive shop drawings review cost by the Owner.
 - g. Other adjustments.
 - 3. Total Contract amount, as adjusted.
 - 4. Previous payments.
 - 5. Remaining payment due.
- C. Owner will prepare a final Change Order reflecting approved adjustments to the Contract amount which were not previously made by Change Orders.

1.11 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit the final Application for Payment reflecting the agreed upon information provided in the final statement of accounting.

1.12 WARRANTIES

- A. Submittal Time: Submit written warranties on request of City for designated portions of the Work where commencement of warranties Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within fifteen (15) days of completion of designated portions of the Work that are completed and occupied or used by City during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Warranties will be provided in paper PDF form and electronically. Provide one (1) paper warranty per warranty.
 - 2. Provide name, phone number, hours of operation, and point of contact for warranty issues.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 77 00

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Detailed information for the preparation, submission, and Owner's and Engineer's review of Operations and Maintenance (O&M) Data, as required by individual Specification sections.

1.02 DEFINITIONS

- A. Preliminary Data: Initial and subsequent submissions for Owner's and Engineer's review.
- B. Final Data: Owner and Engineer-accepted data, submitted as specified herein.
- C. Maintenance Operation: As used on Maintenance Summary Form is defined to mean any routine operation required to ensure satisfactory performance and longevity of equipment. Examples of typical maintenance operations are lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.

1.03 SEQUENCING AND SCHEDULING

- A. Equipment and System Data:
 - 1. Preliminary Data:
 - a. Do not submit until Product Data and Shop Drawings for equipment or system has been reviewed and accepted by Engineer.
 - b. Submit prior to shipment date. Include copy of warranty, bonds, and service contract if specified.
 - c. Submit electronically through e-Builder.
 - 2. Final Data: Submit Instructional Manual Formatted data not less than 45 days prior to equipment or system field functional testing. Submit Compilation Formatted and Electronic Media Formatted data prior to Substantial Completion of Project. Submit through e-Builder and on CD.
- B. Materials and Finishes Data:
 - 1. Preliminary Data: Submit at least 15 days prior to request for final inspection.
 - 2. Final Data: Submit within 10 days after final inspection.

1.04 DATA FORMAT

- A. Prepare preliminary and final data in the form of an instructional manual on electronic media.

- B. Preliminary Data Instructional Manual Electronic Format:
1. Portable Document Format (PDF):
 - a. Submit Preliminary Operation and Maintenance data in PDF format. Minimum PDF resolution provided shall be 300 dpi for Word documents and 600 dpi for Drawings and photos.
 - b. Arrange by specification number and name.
 - c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.
 2. All pages with PDF file to be OCR'd to provide full text search.
 3. Size: 8-1/2 inches by 11 inches, minimum when printed from electronic media files. Provide 11- by 17-inch or 22- by 34-inch size where appropriate, when printed from electronic media.
 4. Cover: Identify manual with typed or printed title "OPERATION AND MAINTENANCE DATA" and list:
 - a. Project title.
 - b. Designate applicable system, equipment, material, or finish.
 - c. Identity of separate structure as applicable.
 - d. Identify volume number if more than one volume.
 - e. Identity of general subject matter covered in manual.
 - f. Identity of equipment number and Specification section.
 5. Title Page:
 - a. Equipment Supplier name, address, and telephone number.
 - b. Subcontractor, Supplier, installer, or maintenance contractor's name, address, and telephone number, as appropriate.
 - 1) Identify area of responsibility of each.
 - 2) Provide name and telephone number of local source of supply for parts and replacement.
 6. Table of Contents:
 - a. Provide as a separate submittal in accordance with Section 01 33 00 – Submittal & RFI Procedures prior to startup and testing.
 - b. Neatly formatted with electronic print and arranged in systematic order with consecutive page numbers.
 - c. Identify each product by product name and asset numbers or symbols as set forth on the Process and Instrumentation Diagrams (P&IDs) and in Contract Documents.
 7. Text: Manufacturer's printed data, or neatly produced with electronic print.
 - a. Arrange margins so that punched holes for three-hole binding would not obliterate data.
 - b. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs.
- C. Final Data Instruction Manual Electronic Media Format:
1. Portable Document Format (PDF):
 - a. After all preliminary data has been found to be acceptable to Owner and Engineer, submit Operation and Maintenance data in PDF format. Minimum PDF resolution provided shall be 300 dpi for Word documents and 600 dpi for Drawings and photos.
 - b. Files to be exact duplicates of Engineer-accepted preliminary data. Arrange by specification number and name.

- c. Files to be fully functional and viewable in most recent version of Adobe Acrobat.
- 2. All pages with PDF file to be OCR'd to provide full text search.

1.05 SUBMITTALS

- A. Informational:
 - 1. Preliminary Data:
 - a. Submit electronic copy containing compiled electronic information for Owner's and Engineer's review per Section 01 33 00 – Submittal & RFI Procedures.
 - 2. Final Data:
 - a. Submit electronic copies through e-Builder and on five CDs containing compiled electronic information in format specified herein.

1.06 DATA FOR EQUIPMENT AND SYSTEMS

- A. Content for Each Unit (or Common Units) and System:
 - 1. 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.
 - c. Function, normal operating characteristics, and limiting conditions.
 - d. Performance curves, engineering data, nameplate data, and tests.
 - e. Complete nomenclature and commercial number of replaceable parts.
 - f. 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.
 - g. Spare parts ordering instructions.
 - h. Where applicable, identify installed spares and other provisions for future work (e.g., reserved panel space, unused components, wiring, and terminals).
 - 1) As-installed, color-coded piping diagrams.
 - 2) Charts of valve tag numbers, with the location and function of each valve.
 - 3) Drawings: Supplement product data with Drawings as necessary to clearly illustrate:
 - a) Format:
 - i. Formatted to print as 8-1/2 inches by 11 inches, or 11 inches by 17 inches, or 22 inches by 34 inches.
 - ii. Identify Specification section and product on Drawings.
 - b) Relations of component parts of equipment and systems.
 - c) Control and flow diagrams.

- d) Coordinate drawings with Project record documents to assure correct illustration of completed installation.
 - 2. Instructions and Procedures: Within text, as required to supplement product data.
 - a. Format:
 - 1) Organize in consistent format under separate heading for each different procedure.
 - 2) Provide logical sequence of instructions for each procedure.
 - 3) Provide information sheet for Owner's personnel, including:
 - a) Proper procedures in event of failure.
 - b) Instances that might affect validity of guarantee or Bond. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
 - c) Operating Procedures:
 - i. Startup, break-in, routine, and normal operating instructions.
 - ii. Test procedures and results of factory tests where required.
 - iii. Regulation, control, stopping, and emergency instructions.
 - iv. Description of operation sequence by control manufacturer.
 - v. Shutdown instructions for both short and extended duration.
 - vi. Summer and winter operating instructions, as applicable.
 - vii. Safety precautions.
 - viii. Special operating instructions.
 - d) Maintenance and Overhaul Procedures:
 - i. Routine maintenance.
 - ii. Guide to troubleshooting.
 - iii. Disassembly, removal, repair, reinstallation, and re-assembly.
 - 3. Special and manufacturer's Warranties: Provide where specified in individual specification sections.
- 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 control and lighting systems.
 - 2. Circuit Directories of Panel boards.
 - 3. Electrical service.
 - 4. Control requirements and interfaces.
 - 5. Communication requirements and interfaces.
 - 6. List of electrical relay settings, and control and alarm contact settings.

7. Electrical interconnection wiring diagram, including as applicable, single-line, three-line, schematic and internal wiring, and external interconnection wiring.
 8. As-installed control diagrams by control manufacturer.
 9. Operating Procedures:
 - a. Routine and normal operating instructions.
 - b. Startup and shutdown sequences, normal and emergency.
 - c. Safety precautions.
 - d. Special operating instructions.
 10. Maintenance Procedures:
 - a. Routine maintenance.
 - b. Guide to troubleshooting.
 - c. Adjustment and checking.
 - d. List of relay settings, control and alarm contact settings.
 11. Manufacturer's electronic printed operating and maintenance instructions.
 12. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- C. Maintenance Summary:
1. Compile individual Maintenance Summary for each applicable equipment item, respective unit or system, and for components or sub-units.
 2. Format:
 - a. Use electronic facsimile of Maintenance Summary Form bound with this section. Fill out each form completely.
 - b. Each Maintenance Summary may take as many pages as required.
 - c. Format for 8-1/2-inch by 11-inch size paper when printed.
 - d. Complete using electronic printing. Added text needs to be OCR compatible.
 3. Include detailed lubrication instructions and diagrams showing points to be greased or oiled; recommend type, grade, and temperature range of lubricants and frequency of lubrication.
 4. Recommended Spare Parts:
 - a. Data to be consistent with manufacturer's Bill of Materials/Parts List furnished in O&M manuals.
 - b. "Unit" is the unit of measure for ordering the part.
 - c. "Quantity" is the number of units recommended.
 - d. "Unit Cost" is the current purchase price.
 5. Provide all nameplate information.

1.07 DATA FOR MATERIALS AND FINISHES

- A. Content for Architectural Products, Applied Materials, and Finishes:
1. Manufacturer's data, giving full information on products:
 - a. Catalog number, size, and composition.
 - b. Color and texture designations
 - c. Information required for reordering special-manufactured products.
 2. Instructions for Care and Maintenance:
 - a. Manufacturer's recommendation for types of cleaning agents and

- methods.
 - b. Cautions against cleaning agents and methods that are detrimental to product.
 - c. Recommended schedule for cleaning and maintenance.
- B. Content for Moisture Protection and Weather Exposed Products:
 - 1. Manufacturer's data, giving full information on products:
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 - 2. Instructions for inspection, maintenance, and repair.

1.08 SUPPLEMENTS

- A. The supplements listed below, following "End of Section," are part of this Specification.
 - 1. Maintenance Summary Form.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 78 23



City of Tacoma
Environmental Services Department

MAINTENANCE SUMMARY FORM

	Description
Project:	
Contract No.:	
Order No.:	
1. Equipment Name	
2. Equipment ID (Asset Number)	
3. Manufacturer	
4. Weight of Individual Components (Over 100 pounds)	
5. Manufacturer's Local Representative	
Name	
Address	
Telephone No.	
6. Electrical or Mechanical Data	
SIZE:	
MODEL:	
TYPE:	
VOLTAGE:	
AMPS:	
RMP:	
SERIAL #:	

SECTION 01 91 14
EQUIPMENT TESTING AND FACILITY STARTUP

PART 1 GENERAL

1.01 DEFINITIONS

- A. Facility: Entire Project, or an agreed-upon portion shown on plan, including all of its unit processes.
- B. Functional Test: Test or tests in presence of Engineer and Owner to demonstrate that installed equipment meets manufacturer's installation, calibration, and adjustment requirements and other requirements as specified.
- C. Performance Test: Test or tests performed after any required functional test in presence of Engineer and Owner to demonstrate and confirm individual equipment meets performance requirements specified in individual sections.
- D. Unit Process: As used in this section, a unit process is a portion of the facility that performs a specific process function, such as foul air treatment.
- E. Facility Performance Demonstration:
 - 1. A demonstration, conducted by Contractor, with assistance of Owner, to demonstrate and document the performance of the entire operating facility, both manually and automatically (if required), based on criteria developed in conjunction with Owner and as accepted by Engineer.
 - 2. Such demonstration is for the purposes of (i) verifying to Owner entire facility performs as a whole, and (ii) documenting performance characteristics of completed facility for Owner's records. Neither the demonstration nor the evaluation is intended in any way to make performance of a unit process or entire facility the responsibility of Contractor, unless such performance is otherwise specified.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Facility Startup and Performance Demonstration Plan.
 - 2. Functional and performance test results.
 - 3. Completed Equipment Test Report for each equipment component (attached at the end of this section).
 - 4. Completed Unit Process Startup Form for each unit process (attached at the end of this section).
 - 5. Completed Facility Performance Demonstration/Certification Form (attached at the end of this section).

6. Completed Startup and Commissioning Checklist and Approval Sheet (attached at the end of this section).

1.03 FACILITY STARTUP AND PERFORMANCE DEMONSTRATION PLAN

- A. Develop a written plan, in conjunction with Owner's operations personnel and Odor Control Bioscrubber Manufacturer's certified representative; to include the following:
 1. Step-by-step instructions for startup of each unit process and the complete facility.
 2. Unit Process Startup Form (sample attached), to minimally include the following:
 - a. Description of the unit process, including equipment numbers/nomenclature of each item of equipment and all included devices.
 - b. Detailed procedure for startup of the unit process, including valves to be opened/closed, order of equipment startup, etc.
 - c. Startup requirements for each unit process, including water, power, chemicals, etc.
 - d. Space for evaluation comments.
 3. Facility Performance Demonstration/Certification Form (sample attached), to minimally include the following:
 - a. Description of unit processes included in the facility startup.
 - b. Sequence of unit process startup to achieve facility startup.
 - c. Description of computerized operations, if any, included in the facility.
 - d. Contractor certification facility is capable of performing its intended function(s), including fully automatic operation.
 - e. Signature spaces for Contractor and Engineer.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 GENERAL

- A. Facility Startup Meetings:
 1. The Contractor shall schedule a minimum of one facility startup meeting for the overall project. Owner, Engineer, and Contractor shall attend and actively participate in the facility startup meetings and associated startup planning activities to coordinate an effective facility commissioning effort.
 2. Other meetings and manufacturer's field services are specified in the individual specification sections.
 3. Agenda items shall include, but not be limited to content of Facility Startup Plan; test methods and schedule, materials, chemicals, and liquids required; coordination needed between various parties in attendance; and potential problems associated with startup.

4. Attendees will include:
 - a. Contractor's designated quality control representative.
 - b. Contractor's Electrical Subcontractor and/or System Integrator (as applicable).
 - c. Owners' representatives, including Owner's programmer.
 - d. Others as required by the Contract Documents or as deemed necessary by the Contractor and Owner.
- B. Odor Control Bioscrubber Manufacturer's and Contractor's Testing and Startup Representative:
 1. Designate and furnish one or more personnel to coordinate and expedite testing and facility startup.
 2. Representative(s) shall be present during startup meetings and shall be available at all times during testing and startup, including assistance to Owner for application software testing.
 3. Provide a complete Testing and Startup Binder with forms. Odor Bioscrubber Manufacturer's and Contractor's Testing and Startup Representative shall maintain a complete, original binder of the testing, including all specified forms along with those added by each vendor or manufacturer.
- C. Provide temporary valves, gauges, piping, test equipment and other materials and equipment required for testing and startup.
- D. Provide Subcontractor and equipment manufacturers' staff adequate to prevent delays. Schedule ongoing work so as not to interfere with or delay testing and startup.
- E. Owner Will:
 1. Provide applications software for Owner-furnished controls.
 2. Provide water, power, and other items as required for startup, unless otherwise indicated.
 3. Operate process units and facility with support of Contractor.
 4. Provide labor and materials as required for laboratory analyses.

3.02 EQUIPMENT TESTING

- A. Preparation:
 1. Complete installation before testing.
 2. Furnish qualified manufacturers' representatives, when required by individual Specification sections.
 3. Obtain and submit from equipment manufacturer's representative Manufacturer's Certificate of Proper Installation Form, when required by individual Specification sections.
 4. Equipment Test Report Form: Provide written test report for each item of equipment to be tested, to include the minimum information:
 - a. Owner/Project Name.
 - b. Equipment or item tested.
 - c. Date and time of test.
 - d. Type of test performed (Functional or Performance).

- e. Test method.
- f. Test conditions.
- g. Test results.
- h. Signature spaces for Contractor and Engineer as witness.
- 5. Cleaning and Checking: Prior to beginning functional testing:
 - a. Calibrate testing equipment in accordance with manufacturer's instructions.
 - b. Inspect and clean equipment, devices, connected piping, and structures to ensure they are free of foreign material.
 - c. Lubricate equipment in accordance with manufacturer's instructions.
 - d. Turn rotating equipment by hand when possible, to confirm that equipment is not bound.
 - e. Open and close valves by hand and operate other devices to check for binding, interference, or improper functioning.
 - f. Check power supply to electric-powered equipment for correct voltage.
 - g. Adjust clearances and torque.
 - h. Test piping for leaks.
- 6. Ready-to-test determination will be by Engineer and Owner based at least on the following:
 - a. Acceptable Operation and Maintenance Data.
 - b. Notification by Contractor of equipment readiness for testing.
 - c. Receipt of Manufacturer's Certificate of Proper Installation, if so specified.
 - d. Adequate completion of work adjacent to, or interfacing with, equipment to be tested, including items to be furnished by Owner.
 - e. Availability and acceptability of manufacturer's representative, when specified, to assist in testing of respective equipment.
 - f. Satisfactory fulfillment of other specified manufacturer's responsibilities.
 - g. Equipment and electrical tagging complete.
 - h. Delivery of all spare parts and special tools.

- B. Functional Testing:
 - 1. Conduct as specified in individual Specification sections.
 - 2. Notify Owner and Engineer in writing at least 10 days prior to scheduled date of testing.
 - 3. Prepare Equipment Test Report summarizing test method and results.
 - 4. When, in Owner's and Engineer's opinion, equipment meets functional requirements specified, such equipment will be accepted for purposes of advancing to performance testing phase, if so required by individual Specification sections. Such acceptance will be evidenced by Engineer/Owner's signature as witness on Equipment Test Report.

- C. Performance Testing:
1. Conduct as specified in individual Specification sections.
 2. Notify Engineer and Owner in writing at least 10 days prior to scheduled date of test.
 3. Performance testing shall not commence until equipment has been accepted by Engineer and Owner as having satisfied functional test requirements specified.
 4. Type of fluid, gas, or solid for testing shall be as specified.
 5. Unless otherwise indicated, furnish labor, materials, and supplies for conducting the test and taking samples and performance measurements.
 6. Prepare Equipment Test Report summarizing test method and results.
 7. When, in Owner's and Engineer's opinion, equipment meets performance requirements specified, such equipment will be accepted as to conforming to Contract requirements. Such acceptance will be evidenced by Owner's and Engineer's signature on Equipment Test Report.

3.03 STARTUP OF UNIT PROCESSES

- A. Prior to unit process startup, equipment within unit process shall be accepted by Engineer as having met functional and performance testing requirements specified. This includes being operable and under control of computer system.
- B. Startup sequencing of unit processes shall as chosen by Owner, in conjunction with the Contractor, Engineer and Odor Control Bioscrubber Manufacturer, to meet schedule requirements. Work shall proceed in accordance with the Facility Startup and Performance Demonstration Plan.
- C. Only the Owner's certified operations personnel shall operate facilities that handle, process, or are associated with wastewater.
- D. Contractor and Odor Control Bioscrubber Manufacturer shall make all adjustments, repairs, and corrections necessary to complete unit process startup.
- E. Contractor's and Odor Control Bioscrubber Manufacturer's startup responsibilities shall be considered complete when, in the opinion of the Owner and Engineer, unit process has operated in manner intended for 7 continuous days without significant interruption. This period is in addition to functional or performance test periods specified elsewhere.
- F. Significant Interruption: May include any of the following events:
1. Failure of Contractor and Odor Control Bioscrubber Manufacturer to provide and maintain qualified onsite startup personnel as scheduled.
 2. Failure to meet specified functional operation for more than two (2) consecutive hours.

3. Failure of any critical equipment or unit process that is not satisfactorily corrected within 5 hours after failure.
 4. Failure of any noncritical equipment or unit process that is not satisfactorily corrected within 8 hours after failure.
 5. As determined by Owner and Engineer.
- G. A significant interruption will require startup then in progress to be stopped. After corrections are made, startup tests period to start from beginning again.

3.04 FACILITY PERFORMANCE DEMONSTRATION

- A. When, in the opinion of Owner and Engineer, startup of all unit processes has been achieved, sequence each unit process to the point that facility is operational.
- B. Demonstrate proper operation of required interfaces within and between individual unit processes.
- C. After facility is operating, complete performance testing of equipment and systems not previously tested.
- D. Document, as defined in Facility Startup and Performance Demonstration Plan, the performance of the facility including its computer system, until all unit processes are operable and under control of computer system.
- E. Certify, on the Facility Performance Demonstration/Certification Form, that facility is capable of performing its intended function(s), including fully automatic and computerized operation.
- F. Satisfies performance criteria specified in individual equipment specifications.

3.05 SUPPLEMENTS

- A. Supplements listed below, following "End of Section," are a part of this Specification:
 1. Equipment Test Report Form.
 2. Unit Process Startup Form.
 3. Facility Performance Demonstration/Certification Form.
 4. Startup and Commissioning Checklist and Approval Sheet.

END OF SECTION 01 91 14



EQUIPMENT TEST REPORT FORM

OWNER: _____ PROJECT _____

Equipment Description (Include description and equipment number of all equipment and devices)

FUNCTIONAL TEST
Date and Time of Test _____

Functional Test Method and Conditions:

Functional Test Results and Comments:

Equipment Supplier: _____	Date: _____
Contractor: _____	Date: _____
Engineer: _____	Date: _____
Owner: _____	Date: _____

(Authorized Signature)

PERFORMANCE TEST
Date and Time of Test _____

Performance Test Method and Conditions:



UNIT PROCESS STARTUP FORM

OWNER: _____ PROJECT _____
Date and Time of Startup _____

Unit Process Description (Include description and equipment number of all equipment and devices):

Startup Procedure (Describe procedure for sequential startup and evaluation, including valves to be open/closed, order of equipment startup, etc.):

Startup Requirements (Water, power, chemicals, etc.):

Evaluation Comments _____

Equipment Supplier: _____ Date: _____
Contractor: _____ Date: _____
Engineer: _____ Date: _____
Owner: _____ Date: _____

(Authorized Signature)



FACILITY PERFORMANCE DEMONSTRATION/CERTIFICATION FORM

OWNER: _____ PROJECT _____
Date and Time of Demo/Cert _____

Unit Process Description (List unit processes involved in facility startup):

Unit Process Startup Sequence (Describe sequence for startup, including computerized operations, if any):

Contractor Certification that Facility is capable of performing as intended function(s), including fully automatic operations:

Equipment Supplier: _____	Date: _____
Contractor: _____	Date: _____
Engineer: _____	Date: _____
Owner: _____	Date: _____

(Authorized Signature)



City of Tacoma
Environmental Services Department

STARTUP AND COMMISSIONING CHECKLIST AND APPROVAL SHEET

OWNER: _____ PROJECT _____

Date and Time of Demo/Cert _____

List	<u>Date Completed</u>	<u>Complete</u>	<u>N/A</u>
Name of unit process to be started and commissioned:			

How many components are in the startup and commissioning?

Is this interim or final startup and commissioning? Circle One: Interim Final

Documents:

Equipment O&M Manuals	_____	<input type="checkbox"/>	<input type="checkbox"/>
Record Drawings to Engineer	_____	<input type="checkbox"/>	<input type="checkbox"/>
Standard Operating Procedures	_____	<input type="checkbox"/>	<input type="checkbox"/>
Process O&M Manual (draft)	_____	<input type="checkbox"/>	<input type="checkbox"/>

Training:

Classroom	_____	<input type="checkbox"/>	<input type="checkbox"/>
Field	_____	<input type="checkbox"/>	<input type="checkbox"/>

Approvals:

Commissioning of the above unit process or component(s) has been completed and the system is hereby released to Owner for normal operation. The above unit process or component(s) is hereby accepted by Owner who will be responsible for operation of this equipment, and is conditionally accepted subject to completion of outstanding punch list items and any design deficiencies. The Owner waives no rights.

Equipment Supplier: _____ Date: _____

Contractor: _____ Date: _____

Engineer: _____ Date: _____

Owner: _____ Date: _____

(Authorized Signature)

DIVISION 2
EXISTING CONDITIONS

<u>Number</u>	<u>Title</u>
02 41 00	Demolition

SECTION 02 41 00

DEMOLITION

PART 2 GENERAL

2.01 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of above and below ground features and appurtenances.
 - 2. Reference Section 01 74 10 – Construction Waste Management for addition requirements related to demolition and construction waste disposal.

2.02 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Not used.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed or removed and reinstalled.

2.03 PRE-DEMOLITION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review structural load limitations of existing structures.
 - 3. Review and finalize demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by demolition operations. Review areas where existing construction is to remain and requires protection.

2.04 SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

- B. Schedule of Demolition Activities: Schedule the following activities in conjunction with the requirements of Section 01 12 00:
 - 1. Detailed sequence of demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
- C. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Pre demolition Photographs or Video: Capture photographs or video detailing condition of work area where Demolition is to be conducted. Submit before Work begins.

2.05 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and disposed.
- B. Landfill Records: Where hazardous wastes are removed from the site, provide indication of receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

PART 3 PRODUCTS

3.01 GENERAL

- A. Provide all materials and equipment in suitable and adequate quantity as required to accomplish the demolition work shown, specified herein, and as required to complete the Project.

PART 4 EXECUTION

4.01 SAFETY REQUIREMENTS

- A. All debris, materials, piping, and miscellaneous waste products from the demolition process shall be removed safely from the project site as soon as possible. Dispose of in accordance with applicable federal, state and local regulations. Contractor is responsible for determining these regulations and shall bear all costs associated with disposal of these items.
- B. Hazardous Materials:
 - 1. Existing facilities, or portions thereof, to be demolished may contain hazardous materials such as:
 - a. Asbestos cement piping.
 - b. Residual chemicals and sludge in existing or abandoned piping.
 - c. Lead-based paint.
 - d. Or other unknown hazardous materials.

2. Take all necessary precautions when handling these materials. Protect work area at all times until hazardous materials are stored in specially treated containers and the area has been cleaned.
3. Remove and dispose of hazardous materials in accordance with Section 01 35 44.
4. Obtain all permits necessary to perform demolition work on hazardous materials.

4.02 UTILITIES

- A. Determine whether there are utilities in demolition areas that are needed for continued service to other facilities. Relocate such utilities before demolition work begins.
- B. Provide temporary services during interruptions to existing utilities as acceptable to Owner and owner of utilities.
- C. Utilities serving facilities to be demolished shall be isolated as shown on the Drawings or as may be directed by the Owner. Isolation shall occur at a point closest to the remaining active portion of the utility.
- D. Remove utility lines that are exposed by demolition excavation. Likewise, remove all manholes, catch basins, and vault type structures no longer in use.
- E. Plug gravity lines with concrete of minimum 3,000 psi compressive strength to prevent groundwater infiltration. Interior of pipe shall be cleaned and then completely filled with concrete for a length of at least three pipe diameters from the ends.

4.03 DEMOLITION

- A. The demolition drawings are based on available information, but the structures, utilities, and appurtenances may differ from what is presented.
- B. Equipment and materials, including piping within the limits of demolition, unless otherwise specified, will become the property of the Contractor.
- C. Drawings define minimum portion of facilities and structures to be removed. Unless otherwise shown, clean saw cuts shall be made to limits of demolition shown. If cuts or breaks are made exceeding limits shown, repair the cuts or breaks back to the dimensions shown on Drawings and to provide a functioning system or utility at the Contractor's expense. Submit repair procedures for Owner's review.
- D. Provide saw cut at all pavement surface and curb removal limits and where neat connection lines are required.
- E. Protect structures and equipment from damage during demolition work. No equipment shall be removed without the written approval of the Owner.

- F. Remove piping from areas to be backfilled. Piping to be abandoned in place shall be capped with a watertight plug at demolished end in a manner that will prevent entrance of soil, groundwater or moisture. Restrained caps or plugs shall be installed at demolished ends for pressurized services and where shown on the Drawings.
- G. Only equipment specified herein, shown on the Drawings, designated by the Owner in the field for removal, or approved by the Owner during construction shall be removed. The limits of removal of equipment shall be as specified on the Drawings or as directed by the Owner. Equipment removal shall include removal of such items as equipment, piping and accessories, supports, piping and tubing supports, fasteners, anchor bolts, and other items.
- H. Removal of equipment shall include removal of concrete pads that support equipment, piping and other accessories.
- I. All other areas of the plant not within the limits of demolition work shown on the Drawings or as specified herein shall be left undisturbed. Any damage to these areas during the demolition process shall be repaired or replaced to original pre-contract conditions at the Contractor's expense.
- J. In areas where concrete portions are to be removed from a structure, the edge of removal shall be cut with a concrete saw to leave a perpendicular edge or core drilled when required removal is circular in shape. All reinforcing shall be cut and removed unless otherwise shown or instructed. Cracked or damaged concrete shall be removed to solid concrete. Spalled edges may be required to be re-sawn at the discretion of the Owner.
- K. Cut off concealed or embedded conduit, boxes, anchor bolts, or other materials a minimum of 1 inch below final finished surface. For existing circuits no longer needed, remove conductors from the conduit. Remove all surface-mounted conduit that is no longer needed. For conduit below grade or concealed within wall, cap and abandon conduit in place. For existing circuits to remain operational, intercept existing conduit at the most convenient location or as shown and splice and extend conduit to new location. Install new conductors where required to accomplish indicated results. New conductors shall be continuous without splices between J-boxes.

4.04 PARTIAL DEMOLITION

- A. Unless otherwise noted on the drawings where concrete removal occurs, existing reinforcing that is exposed shall be burned off at least 1 inch into the remaining concrete. All holes shall be patched with epoxy concrete to form a smooth wall or floor finish.
- B. Backfill of the vicinity of the pipe removal shall be with Native soil conforming to the general and supplementary conditions, and meeting a minimum 95% compaction, in accordance with the ASTM D1557.

4.05 MISCELLANEOUS DEMOLITION

- A. All existing pavement, landscaping, and other surface features demolished because of the Contractor's activities shall be replaced back to its original condition unless other restoration work is called for on the Drawings.

4.06 PROTECTION

- A. The Contractor shall provide protection devices including barricades, fencing, warning signs, lights, and whatever else is necessary to ensure the security of, and within, the facility during all phases of demolition. Requirements of federal, state and local statutes and regulations dealing with demolition or public safety shall be strictly adhered to by the Contractor.

4.07 PHOTOGRAPHS AND VIDEOS

- A. Prior to the removal of existing construction, create photographs or videos of the existing construction to be removed to provide documentation of this facility and its surroundings. These photographs and /or videos shall be submitted to the Owner during the pre-demolition meetings described herein.

END OF SECTION 02 41 00

DIVISION 23

HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

<u>Number</u>	<u>Title</u>
23 31 16.16	Thermoset Fiberglass Reinforced Plastic Ducts

SECTION 23 31 16.16

THERMOSET FIBERGLASS REINFORCED PLASTIC DUCTS

PART 1 GENERAL

1.01 SUMMARY

- A. Scope: This section specifies fiberglass reinforced plastic (FRP) ductwork.

1.02 SERVICE REQUIREMENTS

- A. Air Stream Contents: Saturated air streams at 40-120° F containing hydrogen sulfide in concentrations up to 50 ppm and droplets of sulfuric acid.

1.03 REFERENCES

- A. This Section incorporates by reference the following documents. They are part of this Section insofar as specified and modified herein. In the event of conflict between the requirements of this Section and those of a listed document, the requirements of this Section prevail.

Reference	Title
ASTM C582	Standard Specification for Contact Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
ASTM D2563	Standard Practice for Classifying Visual Defects in Glass Reinforced Plastic Laminate Parts
ASTM D2583	Standard Test Method for Indentation Hardness of Rigid Plastics by Means of Barcol Impressor
ASTM D2584	Standard Test Method for Ignition Loss of Cured Reinforced Resins
ASTM D3982	Standard Specification for Contact Molded "Fiberglass" (Glass Fiber Reinforced Thermosetting Resin) Duct and Hood
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials

1.04 ENVIRONMENTAL CONDITIONS

- A. Environmental conditions per Section 44 31 21.

1.05 SUBMITTALS

- A. Provide the following per Section 01 33 00:
1. A copy of this Section, addendum updates included, with each paragraph check-marked to indicate compliance or marked to indicate requested deviations.
 2. Resin data sheet.
 3. Certification from the resin manufacturer that the selected resin and catalyst systems are appropriate for the specified service conditions,

4. For Filament-Wound Laminates:
 - a. Helix angle.
 - b. Glass content range.
 - c. Strand yield.
 - d. Strand by inch in the winding band.
 - e. Ply thickness.
 - f. Amount of chop or unidirectional roving interspersed with winding, if any, and location within laminate.
5. For Contact Molded Laminates:
 - a. Construction type.
 - b. Laminate thickness.
 - c. Ply sequences.
 - d. Glass content range.
6. For All Secondary Overlays (Both Interior and Exterior):
 - a. Laminate thickness.
 - b. Ply sequences and widths.
 - c. Construction details for all other special configurations and fabricated parts.
7. Duct pressure, vacuum, and temperature ratings.
8. Manufacturer's data and descriptive literature for duct accessories.
9. Piping layout drawings; include field joint locations.
10. Structural calculations sealed by an engineer registered in the state of Washington.
11. Flange bolt torque values.
12. Name of manufacturer.
13. Supports:
 - a. Location plan.
 - b. Type and details.
 - c. Materials of construction.
 - d. Stamped and signed structural engineering design calculations for special supports.
14. Expansion Joints/Flexible Connectors:
 - a. Type and model.
 - b. Materials of construction.
 - c. Force required for expansion/contraction.
 - d. Name of manufacturer.
15. Fabricator Qualifications: List of references substantiating experience.
16. Installer Qualifications: Manufacturer's certification that installer is qualified for installation work.
17. Manufacturer's installation instructions.
18. Manufacturer's factory inspection report.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Minimum 5 years' experience.
- B. Installer Qualifications: Minimum 5 years' experience.
- C. Provide a copy of the fabricator's ISO 9001-based quality control manual.
- D. Acceptance:
 - 1. Lack of compliance with any aspect of the Contract Documents will be grounds for rejection of the equipment.
 - 2. Repair of Rejected Equipment: The Engineer, prior to implementation, must approve repair procedures. No more than 5 percent of the surface area of each FRP duct component may be repaired.
- E. The fabricator's inspector (quality control manager) will submit a complete quality control report for the job. The report will be available within 15 days after the final parts are shipped. The fabricator will have available after each shipment, the completed QC sheets for review upon request at any time.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Candidate manufacturers and models are listed below. The manufacturer's standard product may require modification to conform to specified requirements.
- B. Spunstrand
- C. Daniel Company
- D. Ecoverde
- E. Approved Equal

2.02 FRP DUCTWORK

- A. Design Requirements
 - 1. Design Pressure: 20 inches w.c.
 - 2. Design Vacuum: 14 inches w.c.
 - 3. Conform to ASTM D2996 and ASTM D2310.
 - 4. Manufacturer's design for round section, including duct wall thickness and stiffeners.
 - 5. Provide ductwork with the minimum properties for a 0.25-inch laminate:

Property	Reference Standard	Value
Minimum Ultimate Tensile Strength	ASTM D638	12,000 psi

Property	Reference Standard	Value
Minimum Flexural Strength	ASTM D790	19,000 psi
Minimum Flexural Modulus of Elasticity (tangent)	ASTM D790	800,000 psi

B. Field Conditions

1. Include field verification of existing conditions, space limitations, and required connections in ductwork design.
2. Complete field verification prior to fabrication.

2.03 CONFIGURATION, COMPONENTS, AND FEATURES

A. Expansion Joints/Flexible Connections

1. Provide as specified on Drawings or as required for proper duct installation.
2. Type: W-design configuration with integral flanges suitable for service with FRP duct.
3. Backing Rings: 3/8 inch thick, 2 inches wide, Type 316 stainless steel. ANSI B16.1, Class 125 diameter and drilling.
4. Length: 6 inches, flange-to-flange.
5. Extension: 0.5 inch
6. Compression: 2 inches
7. Lateral Offset: 1 inch
8. Thickness: 0.25 inch, minimum.
9. Holz Rubber Company, Style 945, or Approved Equal.

B. Gaskets

1. Neoprene
2. 0.25-inch thickness
3. Garlock 7986 or Approved Equal

C. Construction details are attached to the end of this Section. If additional details are required (e.g., transitions), submit such details. Approval is required prior to fabrication.

2.04 FABRICATION

- A. Where transitions, rectangular duct or other special system components not specifically detailed in this Section are needed, Fabricator to design the component. Limit flat panel deflection to one percent of panel width. Do not include corrosion liner in structural calculations. Submit calculations, stamped by an engineer registered in Washington, with complete fabrication details.
- B. Reinforce fittings and special sections or increase their shell thickness where combined stresses due to internal pressure and bending will exceed maximum stress; keep combined stresses below recommended maximum.

- C. Round duct safety factor: 10 to 1 for pressure and 5 to 1 for vacuum.
- D. Provide flanges where inside overlay is not possible.
- E. Overlay butt joints both inside and outside. Butt joints permitted only in duct sections that are accessible for inside overlay. Make field butt joints at locations at least 12 inches from any increasing or decreasing cross section of duct. Minimum width of overlay per Detail 5.
- F. Butt joints shall be built up in successive layers and shall be crevice-free in accordance with ASTM D2563. Width of the first layer shall be 4 inches (minimum). Successive layers shall increase uniformly to the specified minimum total width of overlay; centered on the joint. Crevices shall be filled with resin, leaving a smooth inner surface. Comply with Detail 6 for joint tolerance and Detail 10 for overlay criteria.
- G. The inner surface of butt joints shall be free of cracks and crazing, with a smooth finish, with an average of not more than two pits per square foot (pits shall be less than 1/8-inch diameter and maximum of 0.8 mm deep) and covered with sufficient resin to prevent exposure of inner surface fabric. Minimal waviness is permissible provided surface is smooth and free of pits.
- H. Flange dimensions (except thickness) and drilling patterns for flanges that connect to equipment, expansion joints, or dampers are to correspond to ASME/ANSI B16.1, Class 125. Factory drill all flanges. Flange dimensions and drilling patterns for all duct joints are to correspond to ASTM D3982 for FRP ductwork, or Details 1, 2, and 3 herein, whichever is more stringent.
- I. Provide gussets on flanged nozzles from ducts.
- J. Back Face of Flanges: Spot-faced, flat and parallel to the flange face, and of sufficient diameter to accept an SAE metal washer under the bolt head or nut.
- K. Duct and Fittings:
 - 1. Round: ASTM D2310
 - 2. Joints: Butt wrapped unless otherwise indicated on Drawings except flanged at connections to expansion joints, butterfly valves, blast gates, or mechanical equipment to facilitate disassembly.
 - 3. Fittings:
 - a. Plain end or flanged, manufacturer's standard sizes. Comply with Details 1, 2, 3, 4, and 5 herein
 - b. Bends with a centerline radius of 1.5 times the diameter shall be either smooth radius elbows formed over a removable mold or mitered elbows fabricated from straight duct with the following mitre segments:
 - 1) Bends up to 30 Degrees: 1 mitre/2 gore.
 - 2) 31-Degree to 60-Degree Bend: 2 mitre/3 gore.
 - 3) 61-Degree to 90-Degree Bend: 4 mitre/5 gore.

4. Flanges shall have a minimum thickness of 3/4 inch, where connecting to equipment, expansion joints, or dampers. Flange thickness shall comply with Details 1 and 2 herein, whichever is more stringent for duct joints.
5. Transitions: Glass-fiber reinforced, with wall stiffness equal to that of duct, designed using the pipe design criteria. Maximum deflection of a side shall be less than 1 percent of the width of that side at the design internal pressure. Shop-installed reinforcing such as ribs or angles shall be used if required to meet deflection requirements.
6. Marking:
 - a. Identify each duct component with the fabricator's name, resin, minimum thickness, and date of manufacture.
 - b. Use permanent marking. Seal decals and labels into laminate exterior with resin.
 - c. For piece marking used for installation, use oil-based paint for easy removal.
7. Cure products to at least 90 percent of the minimum Barcol hardness specified by resin manufacturer.

2.05 FRP DUCTWORK

A. Resin:

1. Fire-retardant, epoxy vinyl ester: Hetron FR 992 or Derakane 510-C-350.
2. FRP fabrications not to exceed a flame spread index of 25 and smoke development rating of 50 when tested per ASTM E84 Tunnel Test.
3. Structural wall resin shall contain a minimum of 3 percent antimony trioxide to achieve the specified low flame spread index.
4. Special Catalyst: In accordance with the recommendations of the resin manufacturer for the intended service.
5. Add ultraviolet absorbers to surfacing resin to improve weather resistance.
6. Color: No dyes, pigments, or colorants, except in the exterior gel coat. Exterior gel coat will be selected from the fabricator's standard color palette.

B. Construction Method

1. Inner Surface: Resin-rich liner between 0.01-inch and 0.02-inch thick obtained by using one layer of Nexus veil saturated with the specified resin.
2. Interior Layer: Resin-rich interior surface of nominal 100 to 120 mils thick for the entire corrosion barrier, using chopped strand glass mat or chopped glass roving backing the veil. No additive in the corrosion barrier. Minimum, inner surface and interior layer glass content of 27 percent plus +/- 5 percent.
3. Structural Layer: Fabricated using either hand layup construction per ASTM D3982 or filament wound. Minimum structural layer thickness per Detail 1.

4. Exterior Coat: Resin rich with no exposed raw fibers. For interior duct, the final cost shall be a factory applied intumescent coating to achieve the designated results for low smoke development. For exterior duct, resin coat with ultraviolet (UV) inhibitor.

C. Reinforcement

1. Chopped Strand Mat: Type E glass, minimum 1-1/2 ounces per square foot, with silane finish and styrene soluble binder.
2. Continuous Roving for Chopper Gun Spray-Up: Type E glass.
3. Woven Roving: Type E glass, nominal 24 ounces per square yard, 4 by 5 weave, with silane type finish.
4. Continuous Roving for Filament Winding: Type E glass with a silane type finish.

2.06 FASTENERS

- A. Bolts, nuts, and washers shall be stainless steel, AISI Type 316. Type 316 stainless steel backing strips, drilled for the above bolting requirements, shall be employed for all connections at fans, demisting sections, and wherever shear or moment loads may be encountered on duct connections.

2.07 SUPPORTS AND HANGERS

- A. FRP ductwork shall be supported as shown on the Drawings, at intervals no greater than those indicated in the table below. Supports and hangers shall transmit all ductwork loads into the building structural frame through a system of intermediate beams and struts as necessary to accommodate requirements of these specifications. The Contractor shall submit construction details for supports and hangers and its proposed plan for location and type of supports, including location of any required expansion joints. Acceptance of the proposed locations and construction details by the Engineer is required prior to the start of fabrication. Where supports and hangers are detailed on the Drawings, provide as shown.

FRP Ductwork Allowable Spans	
Inside Diameter - inches	Maximum span, feet
<20	10

- B. The contractor may propose alternative support layouts and details, provided that those details and layouts are designed, stamped, and sealed by a professional engineer registered in the State of Washington.
- C. Where it is not feasible to meet the maximum span listed above, the manufacturer may propose thickened wall FRP ductwork to span a longer distance than normally allowable. Provide calculations showing that thickened wall FRP duct will be adequately supported over the longer distance.

- D. Hangers and supports shall be lined with 1/8-inch thick neoprene, bonded to the metal hanger or support, to cushion the duct.
- E. Hangers and supports shall fit the exterior of the duct closely and extend completely around the duct. Minimum width shall be the larger of 4 inches or 1/8 of the duct diameter.

2.08 DAMPERS

A. Design Criteria:

- 1. Pressure: - 10 in WC to + 20 in WC
- 2. Temperature: 32 – 104 deg F
- 3. AMCA Certified for Air Leakage (Class 1) and AMCA Certified for Air Performance. Certifications valid at time of submittal.

B. Materials:

- 1. Body: FRP
 - a. Premium, corrosion resistant, flame retardant, vinyl ester resin: Derakane 510A or Hetron FR992.
 - b. Minimum 3mm corrosion barrier. FRP construction per ASTM D3982 and ASME/ANSI RTP-1.
 - c. Paraffinated gel coat with ultraviolet inhibitor.
- 2. Blade: FRP
 - a. Premium, corrosion resistant, flame retardant, vinyl ester resin: Derakane 510A or Hetron FR992.
 - b. Minimum 3mm corrosion barrier. FRP construction per ASTM D3982 and ASME/ANSI RTP-1.
 - c. L/360 blade deflection. Provide stiffeners as required; 316 stainless steel for any metal used in stiffener construction.
- 3. Shaft: FRP or FRP encapsulated 316 stainless steel
 - a. Extend shaft full length of blade and 6 in beyond frame.
 - b. Mount damper with shaft in horizontal plane.
- 4. Shaft seal: FRP with Viton O-ring
- 5. Bearings: PTFE

C. Configuration:

- 1. End: Flange per ASTM D3982. Flange and corrosion barrier integral to body.
- 2. Manual Operator: crank levers with infinite screw down positioners (316 stainless steel for all metal components). When damper is mounted > 6 ft above finished grade, worm gear operator with chain wheel.

D. Candidate Manufacturers:

- 1. Swartwout Model 914
- 2. Belco Model 203

3. Daniel Mechanical DanELAST 303

2.09 DRAINS

- A. Drains sumps shall be 1-1/2-inch flanged outlets fabricated and installed in accordance with the detail drawings in this section. Each drain shall be fitted with a 316 stainless steel blind flange with a 1-inch NPT PVC half-coupling mounted at its center.
- B. In addition to drains shown on the drawings, drain sumps with 1 1/2-inch minimum flanged outlets shall be provided at all low points. All drain sumps shall be fitted with a 1 1/2-inch PVC ball valve. Drains shall be Schedule 80 CPVC.
- C. Fabricator shall propose and submit construction, location, and installation details of drain sumps.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Cut, fit, and install in accordance with duct manufacturer's recommendations.
- B. Make field joints only when ambient temperature is above 55 °F and below 100 °F.
- C. Ductwork free of vibration when in operation.
- D. Install plumb and straight. Install ductwork sloped at minimum 1/8-inch per foot for proper condensate drainage in direction of flow.
- E. Joining systems suitable for installation without the prior need for sanding.
- F. For permanent joints, the low VOC epoxy is used in conjunction with an integral wound, in-place centerline bead on the internal slip collar. For reconfigurable joints a high corrosion TFE (Teflon®) sealing compound is used in conjunction with a PTFE (Gore-Tex®) centerline bead on the internal slip collar.
- G. Coupling system external sleeves are slipped over the joint seam after applying another layer of low VOC compound and locked into place.
- H. Wrap-it flange system, using Vee-Band®, Yuband®, Vanstone®, or Approved Equal, flanges depending on diameter and application. All metal parts Type 316 stainless steel.
- I. Field Joining Materials: FRP duct manufacturer shall supply all materials needed for any required FRP duct field joining. Supply of these materials shall be in accordance with the requirements of this Section. Provide material in kit form; one kit per joint.

- J. Field Joining: Any required field joining shall be accomplished by a competent person in accordance with the requirements of this Section.
- K. Provide for expansion and contraction.
- L. Large elbows and terminal ends of ducts shall be supported independently.
- M. Flexible connections as described herein shall be provided between fans and ductwork, and elsewhere as indicated on the layout drawings.
- N. Certify installation on Manufacturer's Certificate of Proper Installation.
- O. Apply anti-seize thread compound on all nuts and bolts.
- P. Flange bolts shall be tightened to slightly compress gaskets without disturbing the flanges in order to make a good seal. Install a flat washer under each nut and bolt head.
- Q. Maintain proper ductwork alignment and grade by use of laser beam equipment or surveying instruments. Use surveying instruments to verify laser equipment accuracy due to thermal deflection from differences between the ground temperature and the air temperature within the pipe.
- R. Cleaning: Blow ductwork clean using system fans; purge continuously for not less than 48 hours at the design flow rate. If required, throttle fan on inlet side to prevent motor overload. Install temporary screen on inlet to protect fan from debris.

3.02 EQUIPMENT TESTING, TRAINING, AND COMMISSIONING

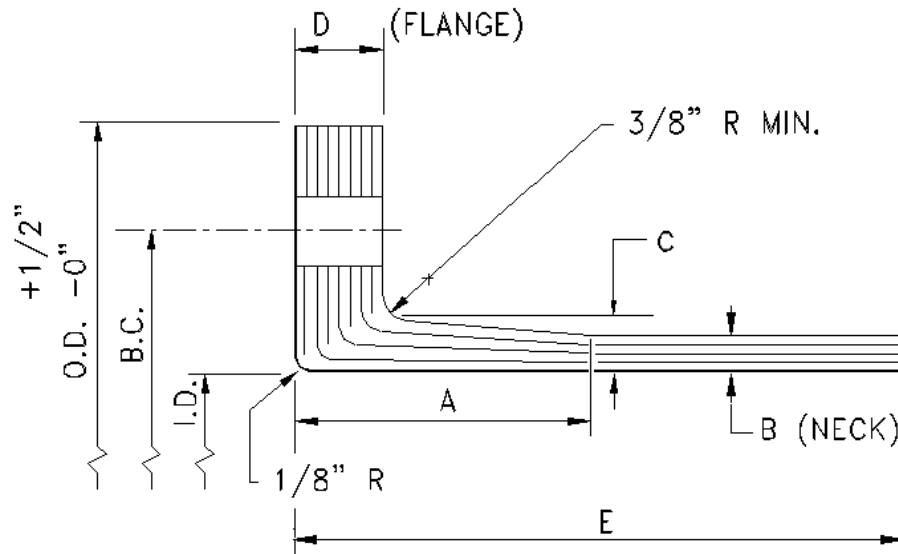
- A. Procedures: Section 01 91 14
- B. Leak test ductwork with 20 inches w.c. of air for 30 minutes. All audible leaks shall be sealed. All tests shall be scheduled with the Engineer by giving 24 hours notice. The Contractor shall provide necessary fittings, blind flanges, etc. to isolate sections of duct and to enable all sections of ductwork to be tested.

3.03 SUPPLEMENTAL DETAILS

- A. Detail 1: FRP Duct and Fitting Thickness
- B. Detail 2: FRP Flanges.
- C. Detail 3: Expansion Boot.
- D. Detail 4: 1-1/2" Dia. Duct Drain and Nozzle Installation.
- E. Detail 5: FRP Butt and Miter Joints.
- F. Detail 6: FRP Tee and Lateral Joints

Duct I.D.	F.W. Wall Thickness	H.L.U. Wall Thickness
Up to 14"	0.21"	0.24"

**FRP Duct and Fitting Structural Thickness
Detail-1**



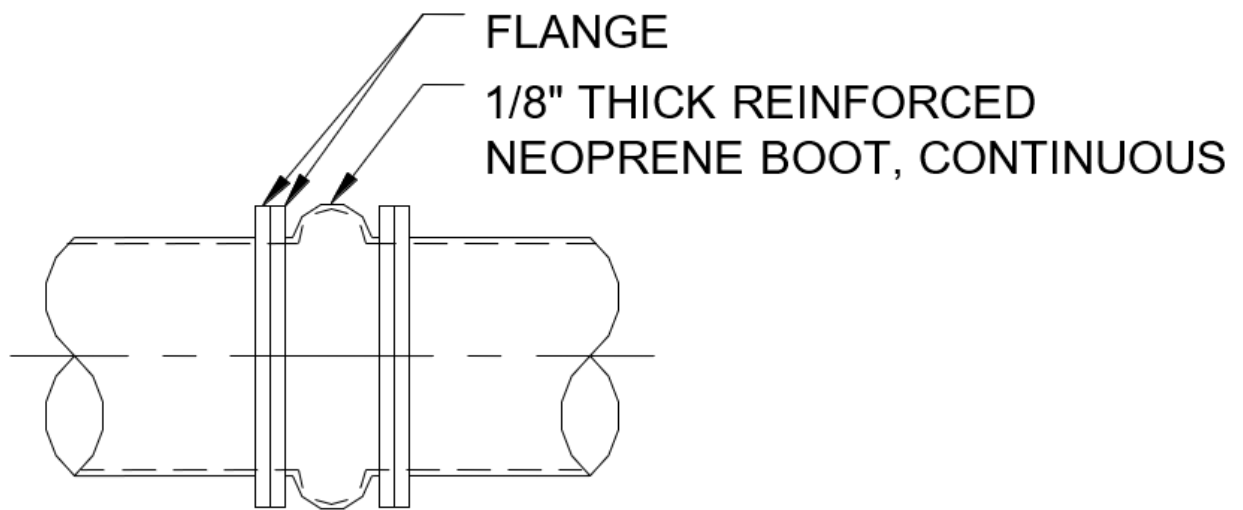
FRP Drilled Flange - Duct Drilling

Nozzle I.D.	Nozzle O.D	Bolt circle	No. of Bolt Holes	Dia. of Bolt Holes	A	B (Table 2)	C	D
Up to 12"	16 3/8"	15"	12	1/2"	2"	0.24"	0.37"	0.50"
14"	18 3/8"	17"	12	1/2"	2"	0.24"	0.37"	0.50"

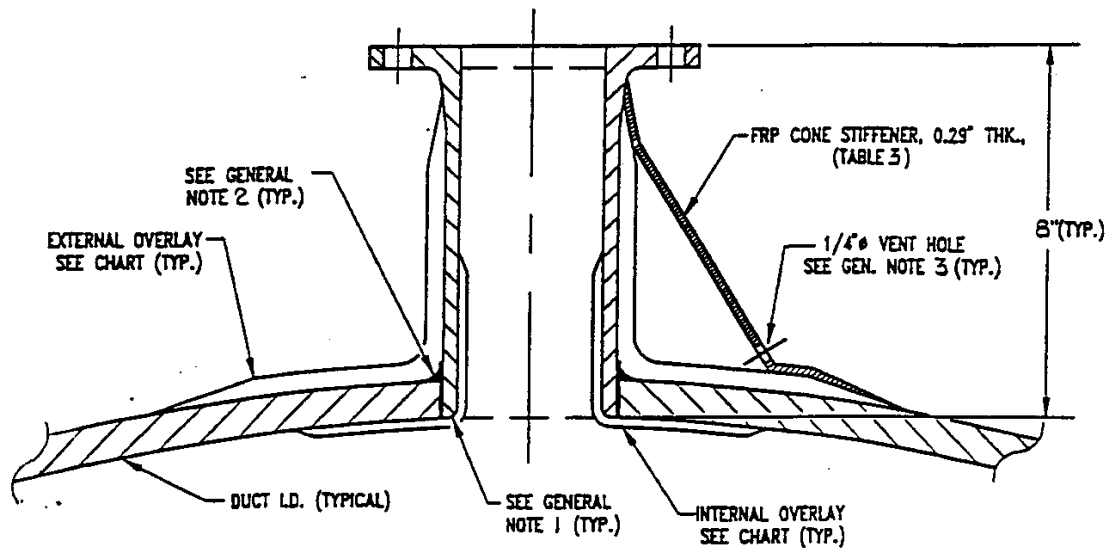
FRP Drilled Flange – 125/150 Pattern

NOZZLE I.D.	NOZZLE O.D	BOLT CIRCLE	NO. OF BOLT HOLES	DIA. OF BOLT HOLES	A	B (Table 2)	C	D	E
1-1/2"	5"	3-7/8"	4	5/8"	2"	0.24"	0.50"	0.50"	8"

FRP Flanges
Detail-2



**Expansion Boot
Detail-3**

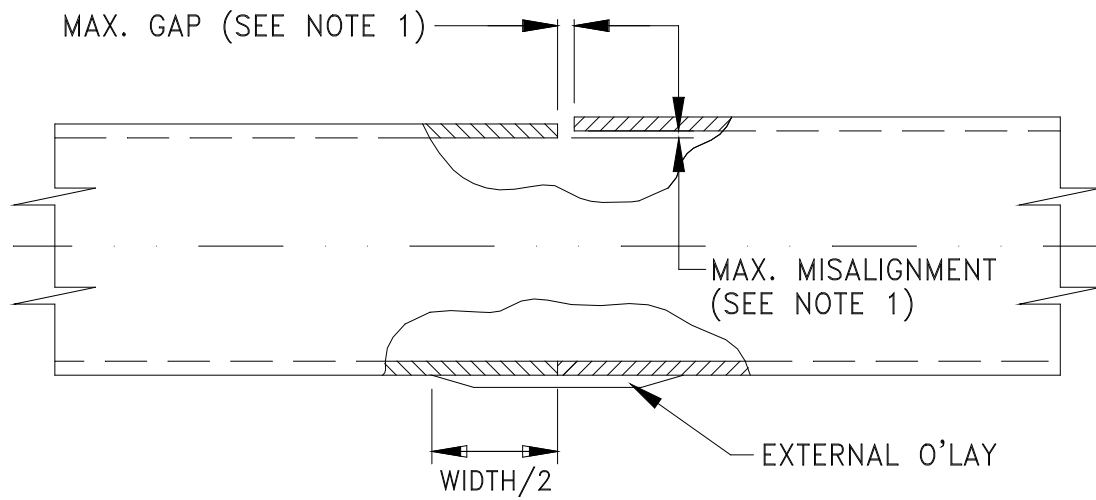


Nozzle I.D.	External Overlay		Internal Overlay	
	THK. (Table 2)	Width	THK.	Width.
1 1/2"	0.29"	10"	(MMCC)"	4"

Notes:

1. Radius inside edge of nozzle, 1/8" min. to 1/4" max.
2. Fill voids with resin putty. Flare putty into a radius 1/4" min. to 3/8" max.
3. Locate vent hole as low as possible, resin coat edge of hole.

**1 1/2" DIA. Drain and Nozzle Installation
Detail-4**



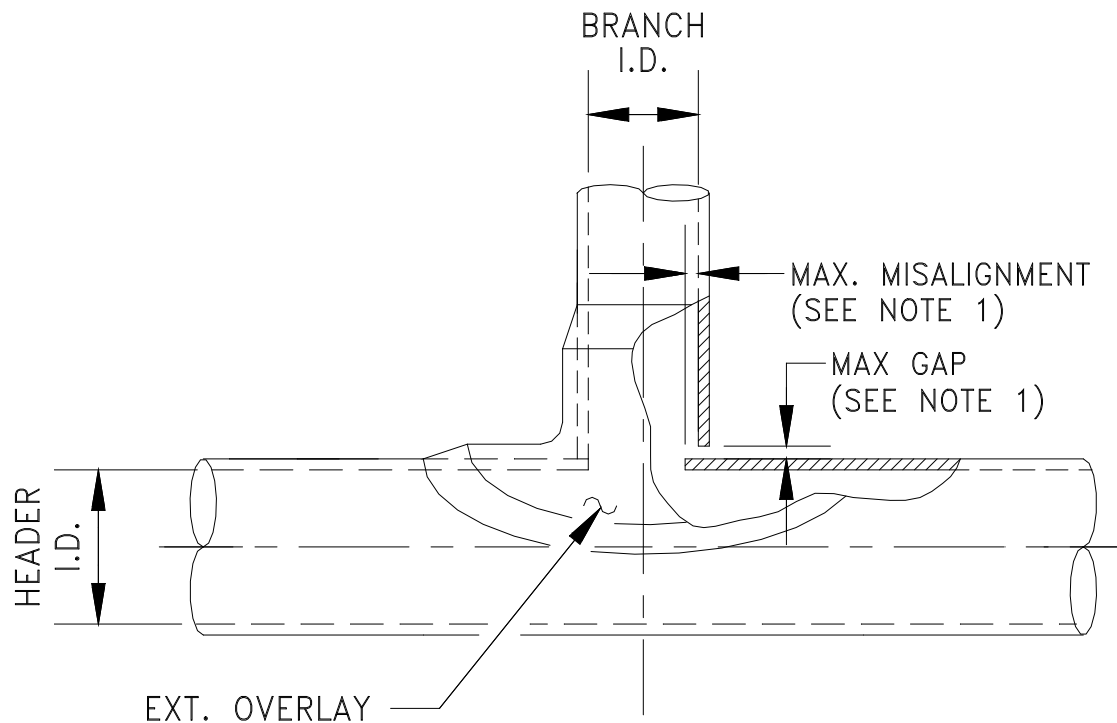
FRP Duct Butt and Miter Joint Overlay

Duct	External Overlay	
	Thickness	Width
Up to 14"	0.30"	8"

Notes:

1. 1/8" maximum misalignment, 1/4" max gap

**FRP Butt and Miter Joints
Detail-5**



FRP Duct Tee and Lateral Joint Overlay

Duct	External Overlay	
	Thickness	Width
Up to 14 inches	0.33"	10"

Notes:

2. 1/8" maximum misalignment, 1/4" max gap.
3. Fill voids with resin putty as shown. Flare putty into a radius 1/4" min. to 3/8" max.

**FRP Tee and Lateral Joints
Detail-6**

END OF SECTION 23 31 16.16

DIVISION 26

ELECTRICAL

<u>Number</u>	<u>Title</u>
26 05 00.01	Common Work Results for Electrical for Small Projects

SECTION 26 05 00.01

COMMON WORK RESULTS FOR ELECTRICAL FOR SMALL PROJECTS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Scope: This section specifies general requirements for electrical work. Project Detailed requirements specified in other sections are subject to the general requirements of this section.
1. Furnish labor, equipment, tools, materials, supplies, and perform operations necessary to install a complete and operable electrical system. Furnish incidental material and perform work shown on the Drawings and in the Specifications.
 2. Perform electrical work and provide material and equipment in compliance with applicable National, State, and Local codes, regulations, laws, and ordinances.
 3. Obtain electrical permits, arrange for required inspections, correct deficiencies resulting from inspections, and pay permit fees and inspections charges. Pay fines and the cost of extra work incurred by action or inaction of the Contractor, at no additional cost to the Owner.
 4. Furnish properly executed certificates of final electrical inspection and approval from the Code Authority Having Jurisdiction (AHJ) at the conclusion of the work, before final acceptance.
 5. Adhere to the Area Classification shown (Drawing E-01) for the product required and the installation required. Provide products in Hazardous Classified Areas in accordance with NEC Article 500 for the Class and Division specified or identified and products in corrosion areas in accordance with this specification.
 - a. Class 1 Division 2 equipment includes, but is not limited to, pump PMP-13322 and fan FAN-13311A.
 6. Maintain a complete set of Contract Drawings in "Record" condition, available for review by the Owner or Engineer. Mark, initial, and date changes, modifications, or corrections, as they occur. Refer to the Record Drawing specification section requirements.
 7. Field verify the exact locations of equipment or equipment terminations. Use accepted equipment submittals as the basis of the conduit openings and slab penetrations.
- B. Drawing Definitions and Requirements:
1. Elementary or Schematic Diagram: Shows, by means of graphic symbols, the electrical connections and functions of a specific circuit arrangement that facilitates tracing the circuit and its functions without regard to the actual physical size, shape, or location of the component devices or parts.
 2. One-Line Diagram: Shows by means of single lines and graphical symbols the course of an electrical circuit or system of circuits and the components, devices or parts used therein. Physical relationships are usually disregarded.

3. Block Diagram: Diagram of a system, instrument, computer, or program in which selected portions are represented by annotated boxes and interconnecting lines.
4. Wiring Diagram or Connection System: Includes all of the devices in a system and shows their physical relationship to each other including terminals and interconnecting wiring in an assembly. A panel layout diagram shows the physical location of devices and the wiring connections.
5. Interconnection Diagram:
 - a. Shows external connections between terminals of equipment in panels or electrical assemblies and outside points, such as motors, auxiliary devices, control devices, and instruments. Provide references to connection diagrams that interface to the interconnection diagrams of the continuous line type.
 - b. Show bundled wires as a single line with the direction of entry/exit of the individual wires clearly shown. Show each wire identification as actually installed. Wireless diagrams and wire lists are not acceptable.
 - c. Provide wire identification for each end of the same wire for devices and equipment, indicate terminal blocks identification actually installed with individual terminal identification.
 - d. Show jumpers, shielding and grounding termination details not shown on the equipment connection diagrams on the interconnection diagrams. Wires or jumpers shown on the equipment connection diagrams shall not be shown again on the interconnection diagram. Signal and DC circuit polarities and wire pairs shall be shown. Show spare wires and cables.
6. Arrangement, Layout, or Outline Drawings: Shows the physical space and mounting requirements of a piece of equipment and may indicate ventilation requirements, space provided for connections, or the location connections are to be made.
7. Drawing Cross-Referencing:
 - a. Reference each submittal drawing submitted to the associated Contract Document and indicate the one-line diagrams, schematics, control diagrams, block diagrams, and Process and Instrumentation Diagrams (P&IDs) cross-referenced on the submittal drawings.
 - b. Internally cross-reference submittal drawings related to the same subject shall be referenced to other submittal drawings. Failure to cross-reference Contract Documents with the submittal shall be cause for rejection of the entire submittal with no further consideration.

1.02 QUALITY ASSURANCE

A. References:

1. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

2. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
ANSI A58.1 / ASCE 7	Minimum Design Load in Buildings and Other Structures, 1982
ANSI C80.1	Rigid Steel Conduit - Zinc Coated, 1994
ASTM B3	Standard Specification for Soft or Annealed Copper Wire, 2001
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft, 1999
ASTM B33	Standard Specification for Tinned Soft or Annealed Copper Wire for Electrical Purposes, 2000
ICEA S-95-658	Standard for Non-Shielded Power Cables Rated 2000 Volts or Less, 2000
IEEE 81	Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System, 1983
IEEE 112	Standard Test Procedures for Polyphase Induction Motors and Generators
IEEE 383	Type Test of Class IE Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations, 1974 (1992)
IEEE 841	Standard for Petroleum and Chemical Industry-Severe Duty Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors – Up to and Including 500 HP
JIC EMP-1	Electrical Standard for Mass Production Engineering, 1967
NEMA TC2	Electrical Polyvinyl Chloride (PVC) Conduit, 2003
NEMA 250	Enclosures for Electrical Equipment (1000 Volt Maximum)
NEMA MG 1	Motors and Generators
NEMA MG1-30	Application Considerations for Constant Speed Motors Used on a Sinusoidal Bus with Harmonic Content and General Purpose Motors Used with Adjustable-Voltage or Adjustable-Frequency Controls or Both
NEMA WC-70	Non-Shielded Power Cable 2000V or Less (ICEA S-95-658), 1999 (2001)
NEMA WD-1	General Requirements for Wiring Devices, 1999
NFPA 70	National Electrical Code (NEC)
UBC	Uniform Building Code
UL 6	Electrical Rigid Metal Conduit – Steel, 12th Edition, 2000 (2003)
UL 44	Thermoset-Insulated Wires and Cables, 15th Edition, 1999 (2002)
UL 67	Panelboards, 11th Edition, 1993 (2003)
UL 83	Thermoplastic-Insulated Wires and Cables, 13th Edition, 2003 (2004)
UL 263	Fire Tests of Building Construction and Materials, 13th Edition, 2003

Reference	Title
UL 360	Liquid-Tight Flexible Steel Conduit, 5th Edition, 2003
UL 489	Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures, 10th Edition, 2002 (2003), Adopted: NEMA AB 1-1999
UL 674	Electric Motors and Generators for Use in Hazardous (Classified) Locations
UL 1004	Electric Motors
UL 1277	Electrical Power and Control Tray Cables with Optional Optical-Fiber Members, 4th Edition, 2001 (2003)

B. Listed and Labeled Products:

1. Provide electrical equipment and materials listed or labeled by an independent testing laboratory for the purpose for which they are to be used and provide associated testing laboratory label.
2. The independent testing laboratory shall be acceptable to the inspection authority having jurisdiction. Test Laboratory examples: Underwriters Laboratories (UL), Electrical Testing Laboratories (ETL), and Canadian Standards Association (CSA).
3. Include costs and expenses incurred for special inspections in the contract price for electrical products required to undergo a special inspection either at the manufacturer's place of assembly or at the installed location by the local inspection authority when a product is not available with a testing laboratory listing or labeling as a separate line item.

C. Factory Tests:

1. Perform factory tests at the place of fabrication and on completion of manufacture or assembly where specified in the individual product specification section.
 - a. Include the costs of factory tests in the contract price.
 - b. Include the costs of Engineer witness of factory tests in the contract price.

1.03 SUBMITTALS

A. The following information shall be provided for all electrical equipment and materials in accordance with Section 01 33 00:

1. Catalog cuts of equipment, devices, and materials requested by the individual specification sections.
 - a. Catalog information with technical specifications and application information including ratings, range, weight, accuracy, and other pertinent product information.
 - b. Edit catalog cuts to show only the items, model numbers, and information that apply.
 - c. Assemble catalog cuts in a folder or three ring binders with a cover sheet, indexed by item, and cross-referenced to the appropriate specification paragraph.
2. Arrangement, layout, and outline drawings with dimensions and weight, as appropriate.

3. Control schematics and interconnection wiring diagrams depicting internal and external wire and cable terminations. Drawing cross-reference to specification and Contract Document drawings.
4. Grounding system arrangement drawings in accordance with Paragraph 2.15 design criteria. Obtain Owner's approval before materials procurement and installation.

1.04 DRAWINGS

- A. Prepare specified drawings on 11-inch by 17-inch drafting media complete with borders and title blocks clearly identifying project name, equipment and the scope of the drawing. Use the contract plan set as the basis.
- B. Prepare drawings to reflect the final constructed state of the project installation or supplied equipment. Provide drawing quality, clarity, and size of presentation to permit insertion in operation and maintenance manuals.

1.05 PROJECT/SITE CONDITIONS

- A. General:
 1. Unless otherwise specified, equipment and materials shall be sized and de-rated for the ambient conditions not less than an ambient temperature of 40 degrees C at an elevation ranging from sea level to **3000** feet without exceeding the manufacturer's stated tolerances.
- B. The following areas are designated as corrosive:
 1. Outdoors
- C. Hazardous (Classified) Areas:
 1. The air treated by the bioscrubber is considered a Class 1 Division 2 Group D Hazard. As such, any electronic device that is inserted into the process piping/vessels or within a 3 foot zone from the same is to be rated explosion proof. See sheet E-01 for classified area.
- D. Construction Materials:
 1. Refer to the individual specification section for each component for material composition and installation practices.
 2. Construction materials required for each area classification are listed in the following table that specifies the type of raceway required for each location and application by RACESPEC sheet. Unscheduled interior conduit shall be galvanized rigid steel conduit: RACESPEC type RMC-Steel. Unscheduled exterior conduit shall be Stainless Steel: RACESPEC type RMC-SS.

Location	Application/Condition	RACESPEC
Indoor non-corrosive	Exposed	RMC-Steel
Indoor corrosive	Exposed	RMC-SS
Outdoor	Exposed	RMC-SS
Hazardous	Exposed	RMC-SS

Location	Application/Condition	RACESPEC
Concealed	Embedded in concrete structure or beneath slab-on-grade	RNC40, or RNC80
Underground	Instrumentation, communications and data signals encased in concrete, ductbank	RNC40, or RNC80
Underground	Power directly buried (Non-Power Utility)	RNC40 or RNC80
Nonhazardous	Final connection to equipment	LFSC
Hazardous	Final connection to equipment	Fittings per NEC Article-500 for the Classified Hazardous Area identified.
Corrosive	Final connection to equipment	LFSC

Notes:

1. Install conduit connections to control stations, enclosures, and device boxes through threaded hubs.
2. Install flexible conduit for final connections to devices, equipment and motors not exceeding 18 inches. Limit length to 36 inches where flexibility is required.
3. Mount enclosures, device boxes, control stations, and raceway systems with 1/4-inch (minimum) air space between the electrical system and supporting structure.

1.06 STORAGE OF MATERIALS AND EQUIPMENT

- A. Store equipment and materials in the factory-sealed container and protect with additional covering and materials to avoid physical damage or weather damage.

1.07 ELECTRICAL NUMBERING SYSTEMS

A. Raceway Numbers:

1. Tag raceways with brass tags at the access locations including manholes, pull boxes, junction boxes, and at the terminations.
2. Tag raceways with aluminum tags where subject to hydrogen sulfide atmosphere typically found at wastewater treatment facilities.
3. Raceway numbers are to be derived by the Contractor. Contractor to use the City of Tacoma's standard naming convention, as applied to this installation.
4. The Conduit Numbering System uses a three-part alpha-numeric code to provide a unique number for each conduit on the project:
 - a. The format is as follows: V-YY-ZZZ
 - 1) Where: V=Purpose (or voltage) code identifying the voltage class or purpose of the wire/cable in the conduit.
 - a) The purpose code is a single letter designation:

V	PURPOSE/VOLTAGE
M	Medium Voltage Power
P	480V or 277V Power
L	120V, 208V, or 240V Power
C	Discrete Control (120 VAC, 24 VDC, 48 VDC, or 125 VDC)
S	Signal (4-20mA, Speed Pot Sensor Cable)

N	Network (Ethernet, Fiber, Digital Bus)
X	Undefined (Spare) Conduit

2) YY= Area Code.

- a) The area code links a conduit number to a specific part of the facility and a conduit schedule. The area code is the 2-digit number assigned to the various parts of the facility at the beginning of the project.
- b) NOTE: The AREA Codes are currently under development by the Owner's Automation Team.

(1) Request the current AREA Codes from the Owner when assigning conduit numbers.

3) ZZZ= A unique 3-digit, assigned number.

b. Application:

1) The following guidelines should be referred to when applying the Owner's conduit labeling standard:

- a) Create a unique conduit schedule for each area code.
- b) Before starting conduit work, plan first. Try to assign the conduit number so that between parallel equipment or parallel process trains only one unique number digits is changed.
- c) Conduit numbers do not need to be sequential. Plan ahead and leave gaps to allow for changes during the design process.
- d) Start conduit numbers at the load (pump, instrument, etc.) and work back to the source (MCC, PLC, etc.).
- e) If a conduit crosses plant areas, do not change the area code unless there is a combination with a conduit from another area.
 - (1) For example, a power conduit in one area retains that area designation back to the MCC, which may be in a different area.
- f) Do not combine purpose codes; for example: a conduit that contains both 480V wiring, purpose code "P" and control wiring purpose code "C" is tagged "P", not "PC". Default the purpose code to the highest voltage.
- g) A new conduit number must be assigned every time there is a change in wire fill.
- h) Assign a unique number to each conduit in a parallel run set.
- i) Consider using a unique first digit of the three digit numbers for different network protocols:
 - (1) 1XX= Ethernet, 2XX= Profibus etc.
- j) Conduits installed for known future equipment should be tagged with the appropriate purpose code and unique number.
- k) Future "X" conduits are installed for unknown future use.
- l) Increment conduit numbers at pullboxes, manholes, junction boxes, etc.
- m) Do not change conduit numbers at pull points (to prevent excessive bends).

- n) When combining conduits in different areas, typically at a manhole or site pullbox, pick one area code for the combined conduits.
- o) Do not assign a conduit number unless there is an actual conduit to be installed.
 - (1) For example, a manufacturer's cable between a DO probe and the DO transmitter is not installed in conduit so it should not be assigned a conduit number

B. Wire and Cable Circuit Numbers:

1. Identify wire and cable circuit numbers at both ends.
2. Identify lighting and receptacle branch circuits with the power source and circuit load, at source and destination locations. Identify the load, location, and circuit in typed panel schedules with corrections shown.
3. Include copies of schematic diagrams, wiring connection diagrams, and interconnection diagrams inside of the equipment enclosure, protected in a plastic container in the equipment print holder.
4. Wire and Cable Numbers:
 - a. Coordinate the wire numbering system with all vendors of equipment so that every field wire has a unique number associated with it for the entire system:
 - 1) Wire numbers shall correspond to the wire numbers on the control drawings or the panel and circuit numbers for receptacles and lighting.
 - 2) Wire numbers shall correspond to the terminal block number to which they are attached in the control panel.
 - 3) Internal panel wires on a common terminal shall have the same wire number.
 - b. Provide the following wiring numbering schemes throughout the project for field wires between process control module, (PCM), vendor control panels, (VCP), motor control centers, (MCC), field starters, field instruments, etc.
 - c. Format shall be: (Origin Location)-(Origin Termination)/(Destination Location)-(Destination Termination).
 - 1) Where:
 - a) Origin Location – Designation of originating panel or device
 - b) Origin Termination - Terminal designation at originating panel or device
 - c) Destination Location – Designation of the destination panel or device
 - d) Destination Termination - Terminal designation at destination panel or device or PLC I/O address at destination panel
 - d. Identify equipment and field instruments as the origin.
 - e. PCMs are always identified as the destination.
 - f. Location is the panel designation for VCP, LCP, or PCM. For connections to MCCs, location is the specific starter tag and loop number. Location is the tag and loop number for motor starters, field instruments and equipment. Any hyphen in the panel designation or tag and loop number shall be omitted.
 - g. Terminal designation is the actual number on the terminal block where the conductor terminates at field devices and vendor control panels.

- h. Terminal designations at motor leads shall be the motor manufacturer's standard terminal designation (e.g. T1, T2, T3, etc.).
- i. Terminal designations at PCMs where the field conductor connects to field terminal blocks for a PLC input or output shall be the PLC address (Note: the following PLC I/O numbering scheme is typical for Allen-Bradley,
 - 1) Discrete Point: W:X:Y/Z
 - 2) Analog Point: W:X:Y.Z
 - a) Where:
 - (1) W = I for input, O for output
 - (2) X = PLC number (1, 2, 3...)
 - (3) Y = Slot number (01, 02, 03...)
 - (4) Z = Terminal number (00, 01, 02...) for a discrete point or a word number for an analog point (1, 2, 3...)
 - 3) Terminal designations at PCMs where the conductor does not connect to a PLC I/O point shall be the terminal number with a "C" prefix (e.g. C0010). For common power after a fuse or neutrals after a switch, the subsequent points shall have capital letter suffix starting with "A" (e.g. C0010A).

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. General:

- 1. Provide new equipment and materials free from defects. Provide material and equipment of the same or a similar type of the same manufacturer throughout the work. Use standard production materials wherever possible.

B. Paint Finish and Galvanizing:

- 1. All supplied materials shall be manufacturer's standard coatings for outdoor wet/corrosive areas and constructed from stainless steel.

2.02 RACEWAYS, BOXES, AND SUPPORTS

A. Raceways and Boxes:

- 1. Pullboxes, handholes, and device boxes are generally called boxes herein. Size boxes, manholes, and handholes in accordance with the National Electrical Code. Provide separate raceways for lighting, receptacles, power, control, instrumentation, and signaling systems.

B. Boxes and Wireways:

- 1. Provide indoor boxes, larger than FD boxes, constructed of stainless steel.
- 2. Provide boxes constructed of **Grade 316L stainless steel** rated NEMA-4X for corrosive areas and for outdoor locations.

3. Size and provide wireways at locations above and below boxes, panels and groups of devices. Comply with the NEC sizing for conductor fill requirements. Wireway NEMA type shall match the location and area classification and equipment NEMA enclosure ratings.

C. Terminal Cabinets:

1. Provide cabinets located indoors-conditioned space with NEMA-12 rating. Provide cabinets located outdoors, in process areas and in corrosive areas with NEMA-4X rating of stainless steel. Provide cabinets with hinged doors and 2 or 3-point stainless steel quick release latches with locking features via handle or latching clasps with provisions for padlocks.
2. Provide Phoenix Contact UT4 series products with terminal identification method per terminal, as specified.

D. Manholes, Handholes and Pullboxes:

1. Manholes, handholes and pullboxes generally called boxes herein, contain wires, cables, and conductors. Provide box dimensions where shown. Provide boxes per NEC sizing rules where the dimensions are not sized or shown.
2. Provide concrete boxes with covers designed for H-20 loading in traffic areas. Engrave box cover: "ELECTRICAL". Provide boxes with hinged, aluminum checkered plate covers with pull-handle to open in non-traffic areas.
3. Provide precast Quazite Compsolite cement/polymer products, or equal, for handholes, pullboxes, manholes, meter boxes, equipment pads, and vaults where allowed by the electric power utility and for projects where precast concrete is not specifically shown or specified.
4. Electrical manholes and/or handholes shall be installed with gravity drain piping to daylight. No French drains or gravel bottoms will be acceptable.

E. Raceway and Box Supports:

1. Provide 316 stainless steel framing channel with end caps to support groups of conduit. Provide individual conduit supports that have one-hole 316 stainless steel malleable iron pipe straps used with 316 stainless steel clamp backs and nesting backs.
2. Provide 316 stainless steel supports, channel, fittings, all-thread, and fasteners in outdoor locations, in corrosive areas, and as shown. Provide factory end-caps for supports and channels.
3. Independently support boxes by 316 stainless steel brackets, expansion bolts, toggle bolts, or machine or wood screws as appropriate. Wooden or plastic plugs inserted in masonry or concrete shall not be used as a base to secure boxes, nor shall welding or brazing be used for attachment.

F. Underground Marking Tape:

1. Provide low-density, polyethylene plastic, underground marking tape and install above and centered for early warning protection for digging near electrical ductbanks.
2. Provide Brady "Identoline"; Services and Materials "Buried Underground Tape"; Somerset (Thomas & Betts) "Protect-A-Line"; or equal. Provide tape with nominal dimension of 6 inches wide, 4-mil thickness.

3. Provide underground marking tape 6-inch wide metallic-lined tape with red polyethylene film on top and with clear polyethylene film on the bottom of the tape for installation above and centered on direct buried cables and conduits without ductbank encasement.
4. Provide black over red marking tape clearly printed with: "CAUTION ELECTRIC LINE BURIED BELOW", or provide OSHA approved marking tape.

G. Nameplates:

1. Provide nameplates for all boxes and enclosures with nameplate wording as shown on the drawings. Provide the tag number or box number with device functional description on device nameplate. Nameplate wording may be changed without additional cost where changes are made during the submittal process or prior to commencement of engraving.
2. Provide machine engraved laminated white phenolic nameplates with black lettering for panel-mounted equipment with the instrument tag number/description in 3/32-inch minimum size lettering and attach to the panel or enclosure with a minimum of two self-tapping 316 stainless steel screws. Provide nameplates for power sources indicating the power loads and nameplates for power loads that indicate the power sources, in accordance with these specifications and the NEC.

H. Raceway Markers:

1. Provide raceway markers: 0.036-inch minimum thickness, solid brass tags or aluminum tags with raceway number or the circuit number, stamped in 3/16-inch minimum height characters and attach tags to the raceway with 316 stainless steel wire. Install raceway markers inside of pull boxes, handholes, manholes, and where entering electrical equipment enclosures.
2. Provide raceway markers indicating the power source and circuit number for lighting and receptacle raceways to the associated panelboard. Interior lighting and receptacle raceways do not require raceway markers for conduit between components.

I. Identification Tags:

1. Provide the following:
 - a. Equipment: Typical size 1-inch x 3-inch wide, white with black engraved equipment number and equipment description.
 - b. Raceway/Conduit: Tags with raceway or conduit number or circuit shown.
 - c. Instrument: 1.5-inch wide, aluminum tag with instrument number and description.
 - d. Conductor: Power, control, or instrument cable with the circuit identified as shown; power source or power/control panel identified; power load, equipment, instrument, or device identified; purpose of the conductors identified.
 - e. Fastener: nylon-coated 48-mil stainless steel wire. Manufacturer: Brady catalog number 23310 or equal with double ferrule type brass wire clamps. Manufacturer: Brady number 23312.

J. General Raceway Requirements:

1. Provide additional pullboxes for conduit runs with greater than 360 degrees in any run between pull boxes. Limit maximum conduit runs without additional pullboxes to 400 feet, less 100 feet for every 90 degrees for the conduit run change in direction.
2. Determine conduit routing that conforms to the installation requirements set forth herein and in accordance with the NEC requirements for size and number of pullboxes. The RACESPEC sheets with specified requirements begin on the next page.

2.03 RACEWAY SPECIFICATION SHEETS (RACESPEC) - RMC-STEEL

A. Raceway Identification:

1. RMC-Steel

B. Description:

1. Rigid Steel Conduit

C. Compliance:

1. ANSI C80.1, UL 6

D. Finish:

1. Hot-dip galvanized after fabrication, inside and outside. Smooth finished surfaces.

E. Manufacturers:

1. Allied Tube and Conduit Corp., Wheatland Tube Co., or equal.

F. Minimum size:

1. Unless otherwise shown: 3/4-inch for exposed; 1-inch for concealed or embedded; 2-inch for ductbank encased.

G. Fittings:

1. Hubs:
 - a. Insulated throat with bonding locknut, hot-dip galvanized. The hubs shall utilize a neoprene "O" ring and shall provide a watertight connection. O-Z Gedney, CHM-XXT, or equal.
2. Unions:
 - a. Electro-galvanized ferrous alloy type Appleton UNF or UNY, Crouse-Hinds UNF or UNY, or equal. Threadless fittings are not acceptable.

H. Boxes:

1. Indoor:
 - a. Type FD cast ferrous for all device boxes and for junction boxes less than 6 inches square. NEMA-12 welded steel 6 inches square and larger. Door shall have hinges with clamp locks. Boxes in process areas shall be NEMA-4 watertight. Boxes in corrosion areas shall be NEMA-4X.

- b. Conduit bodies: ferrous alloy type with screw taps for fastening covers. Gaskets shall be made of neoprene.
- I. Elbows:
 - 1. (3/4" thru 2.5")
 - a. Factory fabricated or field bent.
 - 2. (3" thru 6")
 - a. Factory fabricated.
- J. Conduit Bodies:
 - 1. (3/4" thru 4")
 - a. Malleable iron, hot-dip galvanized, unless otherwise noted. Neoprene gaskets for all access plates. Tapered threads for all conduit entrances.
 - 2. (5" and 6")
 - a. Electro-galvanized iron or cast iron box.
- K. Expansion Fittings:
 - 1. Expansion fittings in embedded runs shall be watertight and shall be provided with an internal bonding jumper. The expansion material shall be neoprene and shall allow for 3/4-inch movement in any direction.
- L. Manufacturers:
 - 1. Appleton, Crouse-Hinds, Hubbell, O. Z. Gedney, or Approved Equal.
- M. Installation:
 - 1. Rigid steel conduit shall be made up tight and without thread compound. Joints shall be made with standard couplings or threaded unions. Steel conduit shall be supported away from the structures using stainless steel straps with nesting backs.
 - 2. Conduit entering boxes shall be terminated with a threaded hub as specified or standard fittings with grounding bushing.
 - 3. Exposed male threads on rigid steel conduit shall be coated with zinc-rich paint.

2.04 RACEWAY SPECIFICATION SHEETS (RACESPEC) - RMC-SS

- A. Raceway Identification:
 - 1. RMC-SS
- B. Description:
 - 1. Rigid Stainless-Steel Conduit
- C. Compliance:
 - 1. ANSI C80.1, UL 6
- D. Finish:
 - 1. Smooth finished surfaces.

- E. Manufacturers:
 - 1. Calbrite, Gibson, or Patriot Industries., or Approved Equal.
- F. Minimum size:
 - 1. Unless otherwise shown: 3/4-inch.
- G. Fittings:
 - 1. Hubs:
 - 2. Unions:
- H. Boxes:
 - 1. Outdoor:
 - a. Type shall be NEMA-4X.
- I. Elbows:
 - 1. (3/4" thru 2.5")
 - a. Factory fabricated or field bent.
 - 2. (3" thru 6")
 - a. Factory fabricated.
- J. Conduit Bodies:
 - a. Stainless steel, unless otherwise noted. Neoprene gaskets for all access plates. Tapered threads for all conduit entrances.
- K. Expansion Fittings:
 - 1. Expansion fittings in embedded runs shall be watertight and shall be provided with an internal bonding jumper. The expansion material shall be neoprene and shall allow for 3/4-inch movement in any direction.
- L. Manufacturers:
 - 1. Calbrite, Gibson, Patriot Industries, Appleton, Crouse-Hinds, Hubbell, O. Z. Gedney, or Approved Equal.
- M. Installation:
 - 1. Rigid Stainless-Steel conduit shall be made up tight and without thread compound. Joints shall be made with standard couplings or threaded unions. Conduit shall be supported away from the structures using stainless steel straps with nesting backs.
 - 2. Conduit entering boxes shall be terminated with a threaded hub as specified or standard fittings with grounding bushing.

2.05 RACEWAY SPECIFICATION SHEETS (RACESPEC) - LFSC

- A. Raceway Identification:
 - 1. LFSC

- B. Description:
 - 1. Liquid-Tight Flexible Steel Conduit
- C. Application:
 - 1. Final connection to equipment subject to vibration or adjustment.
- D. Compliance:
 - 1. UL 360
- E. Construction:
 - 1. Spirally wound galvanized steel strip with successive convolutions securely interlocked and jacketed with liquid-tight plastic cover.
- F. Minimum size:
 - 1. 3/4 inch
- G. Fittings:
 - 1. Cadmium-plated malleable iron body and gland nut with cast-in lug, brass grounding ferrule threaded to engage conduit spiral and O-ring seals around the conduit and box connection and insulated throat. Forty-five and 90-degree fittings shall be used where applicable.
- H. Installation:
 - 1. Do not exceed 36-inch length.

2.06 RACEWAY SPECIFICATION SHEETS (RACESPEC) - RNC40 AND RNC80

- A. Raceway Identification:
 - 1. RNC40 and RNC80
- B. Description:
 - 1. Rigid Nonmetallic Conduit, heavy wall thickness for direct bury, concrete encasement or surface mounting where not subject to physical damage. DZYR per NEC Article 352.
- C. Compliance:
 - 1. NEMA TC2, UL 651
- D. Construction:
 - 1. Schedule 40, high-impact, polyvinyl-chloride (PVC)
 - 2. Schedule 80, high-impact, polyvinyl-chloride (PVC)
- E. Minimum size:
 - 1. 3/4 inch exposed; 2-inch embedded or encased
- F. Fittings:
 - 1. PVC solvent weld type

G. Boxes:

1. Indoor:
 - a. NEMA Class 4, nonmetallic
2. Outdoor and corrosive:
 - a. NEMA Class 4X, nonmetallic

H. Installation:

1. PVC conduit entering fiberglass boxes or cabinets shall be secured by threaded bushings on the interior of the box and shall be terminated with a threaded male terminal adapter having a neoprene O-ring. Joints shall be made with standard PVC couplings.
2. PVC conduit shall have bell ends where terminated at manholes, handholes, or building walls. Bell ends shall terminate flush at the walls and floors and not extend or protrude.

2.07 RACEWAY SPECIFICATION SHEETS (RACESPEC) – XPFS

A. Raceway Identification:

1. XPFS

B. Description:

1. Explosion-proof Flexible Steel Conduit

C. Application:

1. XPFS Conduit coupling shall be used for final connections to motors and other equipment subject to vibration or adjustment in Class I Division 1 and 2 hazardous areas and shall be watertight.

D. Size:

1. 1/2 inch – 4-inch

E. Length: 4-inch – 36-inch

2.08 CONDUCTORS, WIRE, AND CABLE

A. Provide products specified.

B. Unscheduled Conductor Sizing:

1. Size conductors, wire, and cables in accordance with the National Electrical Code where not specified on the Drawings, and install in the minimum size raceway as specified in the RaceSpecs herein.

C. Control Wire Color Coding:

1. Provide control wires with the following colors for the shown voltage:

120 Vac Power, line and load	Black
120 Vac Control	Red
24 Vac	Orange

12 Vac	Brown
Foreign Voltage (AC) (Interlock)	Yellow
AC Neutrals	White
Ground	Green
24 VDC (+ & -)	Blue
12 VDC (+ & -)	Blue
Foreign Voltage (DC)	Yellow

D. Power Conductors:

1. Provide power conductors with following colors for the shown voltage:

Wire	480Y/277V, 3Ø	208Y/120V, 3Ø or 240/120V, 3 Ø	120V, 1Ø
Phase A	Brown	Black	Black
Phase B	Orange	Red	Red
Phase C	Yellow	Blue	High Leg - Orange
Ground	Green	Green	Green
Neutral	White or Gray per NEC 210.4(D)	White	White

2. Provide black insulation conductors larger than #10 AWG with colored 3/4-inch vinyl plastic tape to identify the phase color at each cable termination. Tape wrap with 25 percent overlay to provide minimum of 3 inches of coverage.

E. Scheduled and Unscheduled Wire and Cable:

1. Provide the insulation and jacket material specified in the CABLESPEC sheets for scheduled and unscheduled (not shown) conductors. Provide stranded copper conductors for all wire and cable.

F. Electrical Enclosure Conductor Ratings:

1. Provide conductors with 600-volt insulation ratings in panels and other electrical enclosures. Conductors with less than 600-volt insulation ratings are prohibited, unless specifically identified.
2. Bundle and lace conductors in panels and electrical equipment at intervals not greater than 6 inches, spread into trees and connected to their respective terminals. Provide lacing using plastic cable ties that are tensioned and cut off using a tool specifically designed for the purpose such as a Panduit GS2B. Other methods of cutting cable ties are prohibited.
3. Bundle conductors crossing hinges into groups not exceeding 10 to 15 conductors and protected using nylon spiral flexible covers to protect conductors and provide oversized plastic panel wiring duct within panels.
4. Provide slack in junction boxes, pull boxes, handholes and manholes sufficient to allow cables or conductors to be routed along the walls with the amount of slack equal to largest dimension of the enclosure.
5. Provide dedicated electrical wireways and insulated cable holders mounted and secured on stainless steel unistrut in manholes and handholes.

G. Instrument Signal Cable:

1. Provide terminal blocks at instrument cable junctions within dedicated terminal boxes provided by the installer. Provide twisted shielded cable with individual shield for each pair. Provide twisted shielded cable multi-pair with overall shield and jacket. Provide triads wherever 3-wire circuits are required. Circuits shall not be made using conductors from different pairs or triads.
2. Install instrument, signal, and data communication circuits without splices between instruments, terminal boxes, or panels. Shields as a signal path, except for circuits operating at radio frequencies and utilizing coaxial cables are not acceptable. Common ground return conductors for two or more circuits are not acceptable.
3. Bond shields to the signal ground bus at the control panel. Isolate shields from ground and other shields at other locations by cutting short or taping. Provide terminal strips for signal leads and shield drain wires.
4. Terminate spare circuits and the shield drain wire on terminal blocks at both ends of the cable run. Shields or drain wires for spare circuit cables shall be bonded at control panel only with the other end insulated by tape cover.
5. Provide an instrument stand with terminal box mounted approximately 3 feet above grade to center or as shown. Provide terminal boxes for instrument cable with the cable and conductor labels specified.
6. Install and terminate conductors for paging, security, data communication, voice communication, and telephone systems in compliance with the manufacturer and the system utility recommendations.

H. Splicing and Terminating Materials:

1. Splicing is prohibited within the scope of this project.
2. Provide polymeric insulating material over motor terminations with high dielectric strength mastic or material to seal the ends against ingress of moisture and contamination.

I. Circuit Numbering Marking System:

1. Identify each power, control, and signal conductor at each terminal connection. Machine print the letters and numbers with black on white alphanumeric characters representing the circuit numbering system.
2. Identify conductors, including spares. Provide cable markers and wire markers for distribution and utilization equipment circuits identifying the power source and circuit source from which it is served.
3. Provide the identification system of vinyl power cable strap-on cable markers, vinyl multi-conductor control cable strap-on cable markers, and vinyl or polyolefin wire slip-on sleeves and encircle the conductor.
4. Provide conductor marker used in outdoor, damp, or wet locations on heat-shrinkable polyolefin shrinkable marking sleeves covered with clear heat-shrink sleeve or clear tape cover.
5. Print conductor markers using the Brady Marker "XC PLUS", the Brady LS2000 printer with the Brady sleeve wire marking system, or Engineer accepted equal.

J. Terminal Blocks:

1. Provide terminal blocks with the following features:
 - a. Voltage rated: 600 volts.
 - b. Current rated: match largest conductor connected to the assembly.
 - c. Integral marking strips.
 - d. Terminal block assemblies: provide with mounting channels, barriers, and end clamps.
 - e. Power and grounding terminal blocks: solderless box lug type.
 - f. Control and signal terminal blocks. Manufacturer: Phoenix Contact, NEMA type, 30-ampere.
 - g. DIN-rail mount for direct wiring into terminal blocks.
 - h. Pre-printed snap-in markers.

2.09 CABLE SPECIFICATION SHEETS (CABLESPEC)

A. CABLESPEC Sheets

1. The following CABLESPEC sheets are included in this section:

Type	Volt	Product	Purpose
CAT	600	4-PR#23 Sol BC, PO Ins, OS, PVC Jkt, Industrial Cat 6	Communications
XHHW	600	XLP Insulated Industrial Grade Conductor	Power cable

2.10 CABLE SPECIFICATION SHEETS (CABLESPEC) – CAT

A. Cable System Identification:

1. CAT – Ethernet cable, Ethernet/IP

B. Description:

1. 4 bonded pair, 23 AWG, solid bare copper, Industrial Ethernet Cat 6, UL listed

C. Voltage:

1. 600 volts

D. Conductor Material:

1. Solid bare copper;

E. Insulation:

1. Polyethylene

F. Shield:

1. Aluminum/Polyester (Beldfoil) Tape, single layer, 100% coverage

G. Jacket:

1. Inner - polyvinylchloride (PVC), 0.254"
2. Outer – polyvinylchloride (PVC), 0.335"

- H. Flame Resistance:
 - 1. UL 1666 Riser, FT4
- I. Manufacturer(s):
 - 1. Belden 7953A, no equal.
- J. Execution:
 - 1. Installation:
 - a. Install in accordance with Manufacturer's requirements and Section 26 05 00.01.
 - 2. Testing:
 - a. Test cable according to Manufacturer's requirements.

2.11 CABLE SPECIFICATION SHEETS (CABLESPEC) – XHHW

- A. Cable System Identification:
 - 1. THHN/THWN
- B. Description:
 - 1. Industrial grade single conductor
 - 2. Sizes: 14 AWG through 750 kcmil as shown
- C. Voltage:
 - 1. 600 volts
- D. Conductor Material:
 - 1. Bare annealed copper; stranded per ASTM B8
- E. Insulation:
 - 1. NEC Type XHHW-2, 90 degrees C dry or wet, Cross-Linked Polyethylene (XLP) per ICEA S-66-524 and UL-44, Color in sizes 14, 12 and 10 AWG: Black, Green, Yellow, White, Orange, Brown, Red, Blue
- F. Jacket:
 - 1. None
- G. Flame Resistance:
 - 1. UL 83
- H. Manufacturer(s):
 - 1. Okonite, X-Olene; Cablec, Durasheath XLP; or equal.
- I. Uses Permitted:
 - 1. Power, control, lighting and outlet circuits.

J. Execution:

1. Installation:

- a. Install in accordance with Section 26 05 00.01.

2. Testing:

- a. Test in accordance with paragraph 26 05 00.01-3.02 and using the Wire and Cable Resistance Test Data Form, appended to this Section.

2.12 ELECTRIC MOTORS

A. Scope

- 1. This Section specifies low-voltage alternating current induction motors, 500 horsepower or less. This Section does not specify specialty motors such as hoist motors, valve operator motors, DC motors, or torque-rated motors. Specialty motors are specified in the individual equipment specification(s).

B. Service Requirements

- 1. All equipment shall be designed and built for industrial service and be capable of delivering rated horsepower under the following conditions:
 - a. 100 degrees F maximum ambient temperature.
 - b. 100 percent relative humidity.
 - c. Voltage variations to plus or minus 10 percent of nameplate rating.
 - d. Frequency variations to plus or minus 5 percent of nameplate rating.
 - e. Combined voltage and frequency variations to plus or minus 10 percent total, as long as frequency does not exceed plus or minus 5 percent.

C. General

- 1. Provide all motors in accordance with NEMA MG1, UL 674, UL 1004, the requirements specified in this Section and the individual equipment specification. Motors shall be the supplier's standard industrial product. Additional or better features which are not specifically prohibited by the specifications, but which are a part of the supplier's standard industrial product, shall be included in the furnished motor. A standard industrial product is a product that has been or will be sold on the market through advertisement or supplier's catalogs/brochures, and represents the latest production model(s).
- 2. Factory mount motors to the equipment where practicable.
- 3. Motor Enclosures (See Area Classification Notations on Drawings):
 - a. TECF: Totally Enclosed, Fan Cooled, NEMA MG1.26.2, IEEE 841.
 - b. XP: Explosion Proof, NEMA MG1.26.10.

D. Electrical Requirements (unless the individual equipment specification indicates otherwise):

1. Service Factor

- a. Single-phase motors: 1.0.
- b. Service factor for three-phase motors: 1.15.
- c. Inverter duty motors: 1.0.

- 2. Time rating: continuous in conformance with NEMA MG 1-10.35.

3. Torques: meet, or exceed, the locked rotor and breakdown torques specified for NEMA Design B.
 4. Currents: locked rotor currents not to exceed NEMA Design B values.
 5. Rating: not allowed to operate at greater than their nameplate horsepower. Use of the service factor will not be allowed under conditions of rated voltage and frequency.
 6. Insulation: non-hydroscopic insulation systems conforming to the requirements for NEMA Class F or higher.
 7. Box
 - a. one (1) size larger than standard.
 - b. two (2) connection points (control and power) for all motors
- E. Mechanical Requirements (unless the individual equipment specification indicates otherwise):
1. Frame sizes: Conforming to latest NEMA Standard MG1-11.31 for "T" frames, and all dimensions meeting NEMA Standards insofar as they apply.
 2. Shafts
 - a. In accordance with NEMA "T" or "TS" dimensions.
 - b. Long shafts: Suitable for belt, chain, or gear drive, within limits established by good industrial practice and documented by NEMA Standards MG1-14.42 and MG1-14.07.
 - c. Short shafts: Used for direct connection.
 - d. Provisions for mounting of shaft grounding brushes on variable speed motors where required by these Specifications.
 3. Connection diagrams: Permanently attached to the motor, either inside the box or on the motor frame, in a location readable from the box side.
 4. Primer Coating: manufacturer's standard.
 5. Finish Coating: manufacturer's standard – to be field repaired after installation.
 6. Stainless steel bolts, screws, and other external hardware.
 7. Nameplates
 - a. Engraved or stamped stainless steel.
 - b. Fastened to the motor frame with screws or drive pins of the same material.
 - c. Nameplates shall indicate clearly all the items of information enumerated in NEMA MG1.
 - d. Coordinate the motor nameplate location so it is readily visible for inspection on the completed machine.
- F. Protective Coating: Before shipment, coat the shaft extension and any other external bare exposed metal parts of each motor with an easily removable rust preventive coat.
- G. For Motors Less than ½ Horsepower
1. Provide single-phase, squirrel cage, capacitor start induction run motors designed for 115-V, 60-Hz operation. Motors shall include integral overload protection per NEC Article 430.32B or shall include an external manual motor

starter installed as required to provide overload protection as required per this Section.

H. For Motors ½ through 500 Horsepower

1. General

- a. Provide three-phase, squirrel cage, induction motors designed for 460-V, 60-Hz operation.
- b. Motor enclosure, rpm, horsepower, and modifications (if any) are specified in the individual equipment specification.
- c. Two-speed motors shall be two-winding motors. Two-speed, one-winding consequential-pole motors are prohibited.

2. Totally Enclosed Fan Cooled (TEFC)

- a. Having a Class F insulation with Class B temperature rise.
- b. Comply with the minimum nameplate efficiency in NEMA MG 1. Determine efficiency by the dynamometer test method, IEEE 112, Method B.
- c. Internal surfaces coated with a corrosion-resistant epoxy paint.
- d. Severe duty rated conforming to IEEE 841 guidelines.
- e. Inverter duty rated for application on variable frequency drives as specified in this Section.
- f. Candidate Suppliers
 - 1) Nidec US Motor, 841 Plus
 - 2) Baldor-Reliance Electric IEEE 841, XL, Severe Duty
 - 3) Approved Equal

3. Explosion Proof (XP) Motor

- a. UL 674 listed for Class I, Division 1, Group D hazardous atmospheres.
- b. Class F insulation with Class B temperature rise.
- c. UL-approved breather/drain device provided in the motor drain hole.
- d. Provided with a frame temperature thermostat which does not exceed the UL frame temperature limit code T2A (280 degrees C).
- e. Thermostat containing an automatically reset, normally closed contact rated 2A at 115 VAC.
- f. The nameplate marked with a maximum UL temperature limit code T2A.
- g. Comply with the minimum nameplate efficiency in NEMA MG 1-2016. Determine efficiency by the dynamometer test method, IEEE 112, Method B.
- h. Candidate Suppliers Nidec US Motor, Type LCE, Premium Efficiency
 - 1) Baldor-Reliance Electric Type XP-XEX, IP54 with temperature code T3C, Premium Efficiency
 - 2) Approved Equal.

I. Inverter Duty Motors

1. Motors for use with variable frequency drives shall be inverter duty motors specifically designed for inverter service for the speed range and load torque characteristic required by the associated equipment. Motor Supplier shall certify

motor is compatible with the proposed variable frequency drives and associated equipment.

2. Motors for use with variable frequency drives shall not exceed NEMA MG 1, Class B temperature rise when operating over the specified speed range on the specified adjustable frequency controllers with the specified load speed/torque characteristic.
3. Inverter duty rated motors shall have 4:1 turndown with variable torque motor controllers or constant torque motor controllers rating designed to operate from 25 percent of base speed to base speed continuously with full load current and torque without exceeding Class B temperature rise.
4. Torque requirement for greater turndown and slower speed applications is a custom design; refer to the individual equipment specification for additional requirements. Inverter duty-rated motors shall be designed to operate over the speed or frequency range specified.
5. Motor insulation shall be designed to meet or exceed the 1600 V peak at a minimum of 0.1 microsecond rise time per NEMA MG 1, Part 31.
6. Provide inverter duty motors with over-temperature protection. Motor over-temperature protection for inverter duty motors up to and including 200 horsepower shall be NEMA Type 2 as specified in NEMA MG 1-12, via bimetallic thermal switches (Klixons) embedded in the motor windings.
7. Inverter duty motors shall have electrically insulated bearings or shall be equipped with a shaft-grounding unit mounted on the fan housing with stub shaft extended from the motor shaft. The shaft-grounding unit shall be equipped with two brushes, totally enclosed, and sealed against environmental contamination.

J. Accessories

1. Connection Boxes

- a. Provided with threaded hubs.
- b. Provide neoprene gaskets at the base of the box and between the halves of the box.
- c. Provide a grounding lug within the box for a cable or raceway ground connection.
- d. Boxes shall be designed to rotate in order to permit installation in any of four (4) positions 90 degrees apart.
- e. Provide oversized boxes, a minimum of one (1) size larger than standard.
 - 1) Two (2) connection points (control and power) for all motors.

2.13 VARIABLE FREQUENCY MOTOR CONTROLLERS

- A. This section specifies 480 Vac rated adjustable frequency drive motor controller systems using insulated gate bipolar transistors (IGBT) for pulse width modulation technology (PWM).
- B. The AFDs specified in this section shall be the product of a single vendor and mounted in the specified cabinet enclosure.

- C. The terms AFD (adjustable frequency drive), ASD (adjustable speed drive), VFD (variable frequency drive), and VSD (variable speed drive) are interchangeable for the purposes of this specification.
- D. System Requirements:
1. The AFD system shall convert 460 volt, 60-Hertz nominal input to a suitable voltage and frequency to cause a premium efficient, inverter duty, squirrel-cage induction motor to run at a speed proportional to an external input analog 4 to 2 mA DC or digital input command as specified for the required AFD speed range.
 2. The AFD system shall include rectifier units, inverter units, control circuitry, protective equipment, input line reactors and output load reactors and other filters and accessories as necessary to provide the specified functions to meet voltage and current harmonics at the specified point of common connection and to mitigate the motor reflected voltage wave. Unless otherwise specified, the point of common connection for AFDs shall be the 480 distribution bus (motor control center, distribution panel, etc.) immediately upstream of the AFD.
 3. The AFD shall be UL 508 listed and shall conform to the requirements specified in NEMA ICS 2, 6, 7 and 7.1.
- E. Unit Responsibility
1. The Contractor shall assign unit responsibility for the adjustable frequency drives in this section as specified in Section 44 31 21 Unit Responsibility Certification Form. The Contractor shall submit letters of certification with the shop drawings from the AFD manufacturer, the motor manufacturer, and the driven equipment manufacturer stating that they have reviewed each application and that the combination will satisfy the application duties required, for the actual motor sizes required, regardless of deviations from the scheduled "nominal horsepower."
- F. Manufacturers
1. The Owner and Construction Manager believe the following candidate manufacturers are capable of producing equipment and/or products that will satisfy the requirements of this Section. This statement, however, shall not be construed as an endorsement of a particular manufacturer's products, nor shall it be construed that named manufacturers' standard equipment or products will comply with the requirements of this Section. AFDs shall be installed in the custom enclosures as specified and Candidate manufacturers include:
 - a. Yaskawa
 - b. No equal
 2. Enclosures
 - a. Provide AFD in NEMA 4X enclosures with fan cooling and conformal coating protection on circuit boards for corrosive atmosphere protection.
 - b. Provide NEMA 4X keypad on exterior of enclosure, including standard LOR Start Stop and speed POT controls.
 3. AFD Assemblies
 - a. AFDs shall include the following assemblies:
 - 1) Power disconnect using a thermal magnetic circuit breaker or fused disconnect sized for the specific application by the manufacturer.

- 2) A load reactor for dV/dT mitigation or motor terminator units for addressing dV/dT effects at the motor.
 - 3) Rectifier, direct current bus filter, and inverter.
 - 4) Control circuitry interface with Operator Interface Unit
 - 5) Output protection including phase overload.
- b. AFD Features:
- 1) Fused control circuit transformer and microprocessor for system logic sequencing functions. Provide fuses with blown fuse indicator lamps.
 - 2) Accept a 4 to 20 mA DC and digital speed reference signal.
 - 3) A 4 to 20mA DC and digital output signal proportional to inverter output frequency for the speed range specified.
 - 4) Ethernet/IP dual port option card, capable of supporting a Device Level Ring topology for communication to the existing PCS.
 - 5) Adjustable minimum/maximum frequency limits:
 - a) Minimum frequency shall be adjustable from 6 to 40 Hertz.
 - b) Maximum frequency shall be adjustable from 48 to 90 Hertz.
 - 6) Adjustable and independent timed linear acceleration and deceleration functions, adjustable from 6 to 20 seconds.
 - 7) Current limiting.
 - 8) Automatic restart.
 - 9) Control Wiring:
 - a) 600 volt stranded copper
 - b) 90 degrees C color-coded insulation
 - c) No. 16 AWG
 - 10) Wiring Identification and Termination:
 - a) Crimp type wire lugs with sleeve type markers at each termination point and numbered terminal blocks for external connections.
 - b) Digital signal output for ready, running, remote mode status and trouble alarm.
 - c) Conformal coated terminal blocks for control and signal wires entering and leaving the controller.
 - 11) Control Power:
 - a) Provide a 120 Vac, triple fused, control power transformer for cooling fans and external control circuits when required. Control circuits shall be isolated from power circuits by distance and by insulated barriers.
 - b) Provide 120 Vac or 24 Vdc as required for Operator Interface Unit.
- c. Efficiency:
- 1) Not less than 95 percent at 60 Hertz output driving the specified maximum load at rated torque and speed at 40 degrees C ambient based on measured input power versus output power with all specified components in the system.
- d. Frequency and Voltage Regulation:
- 1) Output frequency regulated to within 0.6 Hertz of the signal/output frequency relationship. Output voltage regulated to within 1.0 percent to

produce minimum motor heating at any operating frequency within the specified range.

e. Frequency Range:

- 1) AFD shall be capable of continuous operation with the specified load at any frequency between 6 and 60 Hertz unless noted otherwise.

G. Protection and Annunciation:

1. Overcurrent Protection:

- a. Electronic current limit at 150 percent of motor nameplate current and provide motor running overcurrent protection in compliance with NFPA 70.

2. Short Circuit Protection:

- a. Protected against load faults: bolted faults, phase to phase or phase to ground shall not damage the unit. Fault protection based on a power source short circuit capacity of [42,000] amperes RMS symmetrical at the AFD power input terminals with impedance or current limiting device provided.

3. Line Voltage:

- a. Protected against high and low line voltage on one or more phases.

4. Internal Faults:

- a. Internal fault monitoring system to detect malfunctions to protect from transient and sustained faults and to limit damage that may be caused.

5. Motor Over Temperature:

- a. Interface to motor over temperature device 2-ampere output contact to shut down and alarm if the motor becomes overheated.

6. Fault Alarm:

- a. Indicates the cause of any shutdown visible on the AFD keypad/display without opening the AFD enclosure. As a minimum, the following faults shall be alarmed:

- 1) Motor over-temperature
- 2) Motor overcurrent
- 3) Incoming power line over/under/unbalanced-voltage
- 4) AFD over-temperature
- 5) AFD over-voltage
- 6) AFD control failure

7. Safety Features:

- a. The AFD shall include:

- 1) Barriers and warning signs on terminals that are energized with the power disconnect "OFF".
- 2) Separation and insulated barriers between the power and control and instrument products.
- 3) External emergency stop input

8. Reverse Direction Protection:

- a. Provide protection from inadvertent operation in reverse where reverse rotation can damage the driven equipment.

9. Critical Speed Bypass:

- a. Provide capability to program speed bypass for minimum two critical speed points.
- 10. Transient Voltage Protection:
 - a. Provide solid state transient voltage protection to meet or exceed ANSI C37.90
- H. Control and Monitoring Communications
 - 1. Additional analog or discrete I/O as required for the project.
 - 2. Profibus Communications card

2.14 WIRING DEVICES

- A. Unless specified otherwise, provide UL approved wiring ivory devices for the current and voltage ratings specified and comply with NEMA WD-1 with provisions for back wiring and side wiring with captive held binding screws.
- B. Heavy Duty 120v Receptacles:
 - 1. Single Phase: Duplex 20-amp, NEMA 5-20R accepting NEMA 5-15P and 5-20P plugs. Cooper 5362, Hubbell 5362, or equal.
 - 2. Ground Fault Interrupting: Ground fault interrupting (GFI) receptacles: duplex, 20 amp, NEMA 5-20R, specification grade that accepts NEMA 5-15P and 5-20P plugs. Provide GFI receptacles outdoors and as shown, UL listed with provisions for testing and resetting. Manufacturer: Hubbell GF-5352-I, or equal.
- C. Switches:
 - 1. Indoor Switches: Quiet AC type, heavy duty, specification grade in accordance with rated capacities as required. Match the switch color and the receptacles color. Manufacturer: Cooper, Hubbell, or equal.
 - 2. Switches for Outdoor and Corrosive Areas: Provide 20-ampere, push-type switches; Cooper Tap-Action, Hubbell PressSwitch, or equal.
- D. Device Plates: Provide device plates with switches and receptacles that match the area classification location.
 - 1. Indoor, Architecturally Finished Areas: Provide switch and receptacle device plates of stainless-steel finish. Manufacturer: Crouse-Hinds, Appleton, or equal in.
 - 2. Indoor, Non-Finished, Non-Corrosive: Provide switch and receptacle device plates of stainless steel finish. Manufacturer: Appleton, Crouse-Hinds, or equal.
 - 3. Indoor, NEMA-12 Areas: In areas designated NEMA-12, or other areas specified provide hinged covers with neoprene gaskets. Manufacturer: Hubbell, Cooper, or equal.
 - 4. NEMA 4X - Corrosive: In areas designated NEMA-4X, Corrosive, or other areas specified provide corrosion-resistant/marine-duty stainless steel type covers. Manufacturer: Hubbell, or equal.
 - 5. In-Use Covers: In areas designated NEMA-4X, Corrosive, or other areas specified, and in outdoor areas, provide in-use type weatherproof lift covers that maintain weatherproof rating with plug installed for equipment that is cord connected with plug and receptacle. Covers shall be cast aluminum.

Manufacturer: Outdoor, NEMA 4X areas: In-use covers shall be Hubbell WP7, WP8, WP26, or equal. Corrosive areas; Manufacturer: TayMac Corporation 20510, Carlon E9UXXXX, Hubbell WP826XXX, or equal.

6. Wet/Corrosive Switch Covers: In outdoor, areas, wet areas, areas designated NEMA-4X, Corrosive, or other areas specified, provide weatherproof, corrosion-resistant covers for switches to maintain weatherproof rating during operation of switch. Covers shall have flexible bubble of silicone or neoprene rubber for switch operation. Manufacturer: Cooper, Hubbell, or equal.
7. Hazardous Areas: Device plates in hazardous areas shall be, rated NEMA 7, suitable for use outdoors and in wet areas. Manufacturer: Appleton, Crouse-Hinds, or equal.

E. Pilot Devices:

1. Provide heavy-duty push buttons, selector switches and indicating lights: 30mm, oil-tight, NEMA 4X. Indicating lights shall be light emitting diode (LED) type lamps. Unless otherwise shown, provide push-to-test type indicating lights. Provide diode isolating type pilot indicating lights specified for remote-test. Provide red indicating lamps for "RUN" indication and green indicating lamps for "STOP".
2. Provide 120VAC control units: Square-D Class 9001 series.

F. Load-Switching Control Relays:

1. Heavy-duty, machine tool type for switching load such as solenoids, actuators, contactors, motor starter coils, and other devices used for remote interlocking.
2. Contacts: 4-pole and field interchangeable to either normally open or normally closed and capable of accepting a 4-pole contact block adder.
3. AC relays: NEMA A600 contact ratings and electrical clearances for up to 600 volts.
4. DC relays: NEMA P300 contact ratings and electrical clearances of up to 250 volts.
5. Manufacturer: Allen Bradley Bulletin-700, Square D Class 8501 Type X, or equal.

G. F. Logic-Level Relays

1. Logic-Level switching solid-state logic and signal circuits:
 - a. Minimum of three SPDT, silver cadmium oxide contacts rated 10-amperes-resistive at 120VAC or 28VDC.
 - b. Plug-in type with heavy-duty, barrier-protected screw terminal sockets.
 - c. Clear polycarbonate dust cover with clip fastener.
 - d. AC models: neon lamp indicator wired in parallel with coil.
 - e. Manufacturer: AB 700-HC Series with pilot and mechanical override to match existing.

H. Timing Relays:

1. Multi-function, micro-controller based, socket mounted timing relay.
2. Single functions:
 - a. Delay on Make

- b. Delay on Break
 - c. Recycle (on time first, equal recycle delays)
 - d. Single shot
 - e. Interval
 - f. Trailing edge single shot
 - g. Inverted single shot
 - h. Inverted delay on break
 - i. Accumulative delay on make
 - j. Retriggerable single shot
3. Dual functions:
- a. Delay on make/delay on break
 - b. Delay on make/recycle (on time first, equal recycle delays.)
 - c. Delay on make/interval
 - d. Delay on make/single shot
 - e. Interval/recycle (on time first, equal recycle delays)
 - f. Delay on break/recycle (on time first, equal recycle delays)
 - g. Single shot/recycle (on time first, equal recycle delays)
 - h. Recycle – both times adjustable (on time first)
 - i. Recycle – both times adjustable (off time first)
 - j. Interval/delay on make
 - k. Accumulative delay on make/interval
4. Time delay range, switch selectable:
- a. Single function 0.1 second to 1,705 hours in 8 ranges.
 - b. Dual function 0.1 second to 3,100 minutes in 8 ranges.
 - c. Setting accuracy +/- 1 percent or 50 milliseconds, whichever is greater.
 - d. Repeat accuracy +/- 0.1 percent or 16 milliseconds, whichever is greater.
5. Output: Two Form-C electromechanical isolated contacts rated 10-amperes resistive at 240VAC and 1/3-horsepower at 120 or 240VAC; double pole double throw: DPDT. Mechanical life: 10,000,000 operations and electrical life: 1,000,000 operations at full load.
6. Mounting: Magnal Plug 11-pin socket
7. Environment: -20 degrees C to +65 degrees C.
8. ABB/SSAC multifunction type TRDU time delay relay with dip-switch function setting with 12VDC, 24VAC, 120VAC, 240VAC inputs as required; Agastat, STA series; IDEC or Engineer accepted substitute.
- I. Elapsed Time Indicators:
- 1. Elapsed time indicators shall be panel mounted, non-resettable five-digit, hour indicator, rated 120 volts, 60 Hz.

2.15 GROUNDING SYSTEM

- A. Provide electrical system grounding electrode conductors, equipment grounding conductors for equipment grounding and raceways, grounding electrodes, grounding electrode conductors, connections, and bonding in compliance with the National Electrical Code-Article 250 and the National Electrical Safety Code (Submittal Required).
- B. Provide annealed bare copper, concentric stranded grounding conductors. Provide the minimum sizes per NEC Article 250 for grounding conductors or service entrance conductors, if not sized on the drawings.
- C. Bond grounding conductors entering enclosures together to metallic enclosure and to metallic raceways terminating at the enclosure. Clean the conductor and enclosure metal surface at the point of connection prior to making equipment grounding connections or bond connections.
- D. Provide ground grid components of #4/0 AWG bare copper conductors connected to 10-foot ground rods installed at the four corners of a building, an equipment pad, or as shown on the Drawings. Provide UFER, concrete-encased electrodes per NEC 250.52(3), by embedding conductors in concrete near bottom of footing.
- E. Make connections grounding conductor connections to equipment and ground rods by compression connectors, or exothermic weld connections in accordance with manufacturer's installation and testing instructions. Make connections to buried grounding connections using compression connectors or exothermic weld connections.
- F. Connect the ground grid to the following with grounding conductor specified herein or connect to the ground grid with grounding conductor as shown on the drawings:
 - 1. Building steel columns with #4/0 AWG bare copper
 - 2. Electrical ductbank #4/0 embedded conductor with #4/0 bare copper
 - 3. Electrical distribution or utilization equipment metal enclosures with #4/0 AWG green insulated copper
 - 4. Metal enclosure not containing electrical distribution with #4 AWG green insulated copper
 - 5. Pump/motor frames with #4 AWG bare or insulated
 - 6. Lightning and surge arresters using #4 AWG bare or insulated
 - 7. Fences and gates with #4 AWG bare or insulated
 - 8. Ground rods with #4/0 AWG bare copper
 - 9. Power utility service entrance equipment with #4/0 bare copper
 - 10. Equipment ground plate with #4/0 AWG bare copper.
 - 11. Other equipment: provide #1 AWG green insulated copper. Provide ¾" conduit protection where subject to damage.
- G. Ground Rods:
 - 1. Ground rods: copper-clad steel, 3/4-inch diameter and 10-feet long, with threaded end for connectors or installation tools.

- H. Compression (Irreversible) Connectors:
 - 1. Compression connections: cast copper.
 - 2. Manufacturer: Thomas & Betts Company, or equal.
- I. Exothermic Connectors:
 - 1. Exothermic connections copper products. Manufacturer: Cadweld process or equal.
- J. Equipment Ground Plate:
 - 1. Provide equipment ground plates embedded flush in equipment pads to provide a bolted connection between a grounding conductor from the equipment frame to the ground grid.
 - 2. Provide ground plates of copper alloy construction and 1/2 inch, threaded bolt connections and integral #4/0 welding stud. Manufacturer: Cadweld Series B-162, or equal.
- K. Raceway Ground:
 - 1. Install metallic conduits to provide a continuous ground path. Use insulated grounding bushings and bonded to the ground grid system in compliance with Article 250 of the National Electrical Code.
 - 2. Provide an equipment-grounding conductor with green insulation in all metallic and non-metallic conduit, raceway, wireway, gutter, or ductbanks.
 - 3. Provide an equipment grounding conductor with green insulation for size up to #6 AWG and provide green color insulation tape band for conductor size #4 AWG and larger.

2.16 POWER, CONTROL, AND METERING EQUIPMENT

- A. Combination Motor Starters:
 - 1. Provide NEMA rated for the horsepower for combination motor starters, minimum size 1, with motor circuit protector and solid-state type overload relay. Provide a reset button located on the unit door exterior.
 - a. Accepted Manufacturers: AB (contactor with E300 overload with ethernet connection), or Square D (contactor with Motor Logic overload).
 - 2. Provide adjustable motor circuit protector with magnetic only trip setting adjustable over a range of 600 to 1300 percent of full load current of the motor served. Field adjust motor circuit protector setting per NEC and manufacture's recommendations. Provide 22,000 symmetrical ampere interrupt rating, where not shown on the power single line diagrams.
 - 3. Provide solid-state adjustable overload relay to latch in the open position. Provide adjustable trip settings with minimum adjustable range from 85 to 115 percent of full load current of motor served. Field adjust overload setting per NEC and manufacture's recommendations.
 - 4. Provide control power transformers with two primary fuses rated at 100,000 amperes at 600VAC and one secondary fuse rated at 10,000 at 250VAC and sized at 125 percent of the control circuit full load current. Ground the non-fused leg of the secondary circuit.

5. Provide switchboard type MTW or SIS control circuit conductors rated 90 degrees C above ambient temperature. Conductors shall be identified with tag numbers.
6. Provide motor contactor "Run" status contact and "Overload" alarm contact. Provide "Hand-Off-Auto" (HOA) and other shown selector switches with a "Auto Mode" status contact wired to terminal block.
7. Provide heavy-duty selector-switches and pushbutton and indicating lights with rating to match enclosure type. Provide control devices rated at 600VAC, 10-ampere continuous with
8. Provide start/stop pushbuttons with "Run" and "Stop" indicating lights including other control devices as shown. Provide push-to-test transformer type pilot lights or LED pilot lights. Lens color as shown on the drawings or specified herein.

B. Manual Starters:

1. Provide manual starters with horsepower rated, quick-make, quick-break, toggle mechanism with overloads in each phase. Provide NEMA-12 enclosures indoor and NEMA-4X stainless steel enclosures outdoor, process areas, and corrosive areas. Provide label for power source and load as shown.

C. Safety Disconnect Switches:

1. Provide safety disconnect switches:
 - a. Motor horsepower rated, heavy-duty, non-fusible
 - b. Safety type rated 600 volts AC
 - c. Ratings and fuse size as shown
 - d. Rating and fuse size as required by the utilization equipment manufacturer
 - e. Disconnect "open status" switch rated 1-ampere
 - f. Switch operator with a positive, quick-make, quick-break mechanism
 - g. NEMA-12 indoor-conditioned space, or as shown
 - h. NEMA-4X stainless steel below grade, process areas, outdoors, corrosive areas, or as shown
 - i. NEMA-7 aluminum hazardous classified areas.
 - j. Tinplated copper products. Silver-plated products are prohibited.
 - k. Manufacturer: Square-D, GE, Allen-Bradley and Cutler Hammer or approved equal.

2.17 MCC MODIFICATIONS

- A. Design includes modifications to an existing MCC. Contractor will inspect the existing MCC and provide new parts (as shown on the design drawings) for this project that match the existing MCC manufacturer and build. Parts included in this design are (but not limited to);
1. MCC Bucket Door with cutout for breaker handle
 2. Thermal magnetic circuit breaker (or Engineer approved), matching existing MCC breakers (type, manufacturer, kAIC rating, etc) and sized as per the design drawings.
 3. MCC Bucket through door handle for circuit breaker operation.

2.18 PRODUCT DATA

- A. The following information shall be provided:
 - 1. Operating and maintenance information as specified in Section 01 78 23.
 - 2. One 11" x 17" set of drawings in a protective covering and shipped with the equipment in the internal equipment pocket at the time of equipment delivery to the project site.
 - 3. Record documents as specified in Section 01 77 00.
 - 4. Certificates of final electrical inspection and approval from the Code Authority Having Jurisdiction (AHJ) as specified in paragraph 26 05 00.01-1.01 A 4.

PART 3 EXECUTION

3.01 GENERAL

- A. Construction:
 - 1. Perform the work specified by Contract Documents in accordance with these specifications.
 - 2. Coordinate the location of electrical material or equipment with the work and adjust conduit location to accommodate equipment in accordance with the accepted submittal drawings from the manufacturer.
- B. Housekeeping:
 - 1. Protect electrical equipment from dust, water and damage. Cover the exterior to keep dry. Electrical distribution equipment such as motor control centers, switchgear, switchboards, panelboards, and other power source buses shall be clean and free of dust and dirt.
 - 2. Protect electrical equipment temporarily exposed to weather, debris, liquids, or damage during construction as specified in Shipment, Protection, and Storage section. Touch up scratches on equipment as specified in Coating Systems section before final acceptance.
 - 3. Wipe clean and vacuum equipment on the inside prior to acceptance testing and energization and again prior to detailed inspection and acceptance of the work.
- C. Installation:
 - 1. Perform the installation work specified in accordance with these specifications.
 - a. Splices are not allowed except by permission. Submit proposed splice locations to the Engineer and Construction Manager for review prior to installation. Splices and terminations are subject to inspection prior to and after insulating and may require re-termination after inspection. Underground splices will not be allowed.
 - b. Lighting and receptacle circuits may be in the same conduit in accordance with derating requirements of the NEC. Lighting and receptacle circuits in conduits with power or control conductors is prohibited.
 - c. Adhere to the NEC raceway fill limitations. Provide separate conduits for signal and instrument conductors and cables.

- d. Install power conductors derived from uninterruptible power supply systems in separate raceways.
- e. Provide terminations at 460-volt motors by bolt-connecting the lugged connectors and insulating. Alternately, provide Tyco Electronics GelCap Motor Connection Kit by Raychem.
- f. Install pre-approved in-line splices and tees with tubular compression connectors and insulate. Splices and tees in underground handholes or pull boxes shall be insulated using Scotch-cast epoxy resin splicing kits.
- g. Provide self-insulating tubular butt-splice type of compression connectors for terminations at solenoid valves, 120-volt motors, and other devices furnished with pigtail leads.
- h. Adjust motor circuit protectors in accordance with manufacturer's instructions and NEC requirements.
- i. Adjust motor overload device in accordance with manufacturer's instructions and NEC requirements.

D. Conductors, Wire, and Cable Installation:

- 1. Identify conductors at each connection terminal and at splice points with the identification marking system specified.
- 2. Install wire and cable into raceways, conduit, cable trays, or wireways without damaging or putting undue stress on the insulation or jacket. Provide manufacture's recommended and UL Listed pulling compounds lubricants for pulling wire and cable. Grease is prohibited.
- 3. Raceway construction shall be complete, cleaned, and protected from the weather before cable is installed. Provide wire or cable support where wire or cable exits a raceway. Provide reusable stainless steel Kellums grips or equal product where cable support is required and where loads are removable.
- 4. Scratch-brush the contact areas and tinplate the connection where flat bus bar connections are made with tinplated or unplated flat bus bar. Provide non-oxide material approved for the function. Torque bolts to the bus manufacturer's recommendations.
- 5. Adhere to raceway fill limitations defined by NEC and the following: Lighting and receptacle circuits may be in the same conduit in accordance with de-rating requirements of the NEC. Lighting and receptacle circuits shall not be in conduits with power or control conductors. Control conductors shall be in separate conduits. Signal conductors shall be in separate conduits.
- 6. Install pre-approved in-line splices and tees made with tubular compression connectors and insulated as specified for terminations and for motor terminations. Splices and tees in underground handholes or pull boxes shall be insulated using Scotch-cast epoxy resin or equal splicing kits.
- 7. Conductors in all handholes and manholes shall have adequate slack to be tied up around the perimeter of the vault and will be suspended by insulators around the vault's perimeter as needed to support the cable.

E. Raceway Installation:

- 1. Provide additional pullboxes for conduit runs with greater than 360 degrees in any run between pull boxes. Limit maximum conduit runs without additional

pullboxes to 400 feet, less 100 feet for every 90 degrees for the conduit run change in direction.

2. Determine conduit routing that conforms to the installation requirements set forth herein and in accordance with the NEC requirements for size and number of pullboxes.
 - a. Install exposed conduit either parallel or perpendicular to structural members and surfaces.
 - b. Route two or more exposed conduits in the same general routing parallel with symmetrical bends.
 - c. Install exposed conduit on supports spaced not more than 10 feet apart.
 - d. Install conduits out from the wall using framing channel where three or more conduits are located in parallel run.
 - e. Install conduits between the reinforcing steel in walls or slabs that have reinforcing in both faces. Verify installation method for conduits larger than 2-inch with Construction Manager prior to installation.
 - f. Install conduit in slabs that have only a single layer of reinforcing steel, under the reinforcement.
 - g. Install conduits with large radii under the slab in a one-sack concrete slurry.
 - h. Route conduit clear of structural openings and shown future openings.
 - i. Provide conduit roofs or wall penetrations with flashing sealed watertight and fire-stop, as required to maintain the structural rating.
 - j. Grout conduit into any openings cut into concrete and masonry structures.
 - k. Cap conduits during construction to prevent entrance of dirt, trash, and water.
 - l. Terminate exposed conduit stubs for future use with pipe-caps and provide couplings and pipe-plugs where flush with the slab.
 - m. Determine concealed conduit stub-up locations from the manufacturer's shop drawings.
 - n. Terminate conduit in equipment with conduit couplings with pipe-plugs flush with structural surfaces for empty conduit.
 - o. Install conduit horizontally with at least 7-feet headroom clearance.
 - p. Terminate conduit with fittings that ensure that the NEMA rating of the enclosure and provide conduit hubs, as required heretofore.
 - q. Connect underground metallic or nonmetallic conduit that turns out of concrete, masonry, or earth to a 90-degree elbow of PVC-coated rigid steel conduit before emergence. Taped or painted RMC-Steel or RNC is prohibited.
 - r. Provide conduit crossing structural joints with structural movement with O-Z "Type DX" or Crouse-Hinds "Type XJG-SA," aluminum, bonded, weather-tight expansion fitting of the same size and type as the conduit.
 - s. Seal conduits in corrosive areas using removable mastic material.
 - t. VFD motor feeder circuits shall be routed a minimum of 12 inches from any control conduits. Should they cross they shall cross at 90 degrees.

F. Underground Raceway Installation:

1. Adhere to the Power Utility underground service entrance requirement for excavation, raceways installation and termination, pads and reinforcement, backfilling, and location criteria. Provide excavation, backfilling, and concrete work as specified and shown.
2. Provide underground conduit installations that conform to the following requirements:
 - a. Direct bury underground conduits that are not shown to be installed in an electrical ductbank.
 - b. PVC coated RMC-steel elbows for underground to above ground transitions.
 - c. Underground conduit bend radius: not less than 2 feet minimum at vertical risers nor less than 3 feet elsewhere for up to 2-inch diameter conduit.
 - d. Determine conduit manufacturer's bending radius requirement for 3-inch and larger diameter conduit and use factory "long radius" ells.
 - e. Underground ductbanks and direct-buried conduits: 2-feet minimum earth cover, except where shown otherwise.
3. Contractor shall coordinate with the City for access to the underground raceway before backfilling. The City currently scans all underground raceway and piping before the trench is backfilled – coordination will require approximately 3 days' notice.

G. Electric Motor Testing

1. The Supplier shall provide detailed procedures for the Field Testing of the equipment specified in this Section.
2. Field Testing and Facility Startup shall be performed under the direction of experienced and qualified personnel provided by the Supplier.
3. Following successful Field Testing, Supplier shall provide a Certificate of Proper Field Testing and Facility Startup.
4. Verify breather/drain fittings installed as specified in the Drawings.
5. Motor Tests: The Installed Motor Test Form, 26 05 00.01-B, appended to this Section, shall be completed for each motor after installation.
 - a. Motors shall have their insulation resistance measured before they are connected.
 - b. Motors 50 HP and larger shall have their insulation resistance measured at the time of delivery as well as when they are connected.
 - c. Motor winding insulation resistance shall not be less than 10-megohm, measured with a 1000 VAC megohm meter at 1-minute at or corrected to 40 degrees C.

H. Electrical Equipment Labeling – Arc Flash

1. Electrical equipment shall have field marked signs and labeling to warn qualified persons of the potential electric arc flash hazards per NEC Article 110.16 Flash Protection. These labels will be provided by the Contractor.

3.02 TESTING

- A. Provide electrical equipment acceptance tests in accordance with the latest version of NETA Acceptance Testing Specification for electrical distribution and utilization equipment to demonstrate that all electrical equipment is functioning as designed.
- B. Test lighting system for proper function. Test wiring devices for correct connections. Test outlet grounding and polarity using a plug-in test device. Test motor control stations and control devices for proper function.
- C. Test power, control, instrument, and signal conductors to verify free from grounds. Megger test all conductors with the test voltage appropriate to the conductor insulation voltage. Use a 600 or 1,000-volt megohmmeter for resistance measurements for 600VAC rated insulation and all motors. Test between conductors and from conductor to ground. Insulation with resistance of less than 10-megohms is not acceptable. Record the insulation resistance measurements in a format similar to or on the Form 26 05 00.01-A, appended to this Section.
- D. Pre-test conductors prior to installation, as appropriate. Replace damaged conductors. Test all conductors after installation.
- E. Measure motors insulation resistance before they are connected. For 50-horsepower and larger motor, measure the motor insulation resistance at the time of delivery and after they are connected. Insulation resistance values less than 10 megohms are not acceptable. Complete the Installed Motor Test Form: 26 05 00.01-B, appended to this Section, for each motor after installation.

3.03 FUNCTIONAL CHECKOUT

- A. Prior to energization of equipment, perform a functional checkout of the control circuit. Prior to functional testing, adjust and make protective devices operative. Energizing each control circuit and operating each control, status, alarm, protective device, and each interlock to verify that the specified action occurs. Submit a description of his proposed functional test procedures prior to the performance of functional checkout.
- B. Verify motors are connected to rotate in the correct direction by momentarily energizing the motor. Prior to motor rotation test, confirm that the motor, the driven equipment, nor personnel will be damaged by reverse operation.

3.04 GROUNDING SYSTEM TESTS

- A. Test each grounding connection to determine the ground resistance per the IEEE Standard 81. Submit a plot of ground resistance readings for each isolated ground rod or ground mat to the Construction Manager on 8-1/2 x 11-inch size graph paper.
- B. The current reference rod shall be driven at least 100 feet from the ground rod or grid under test. Make measurements at 10-foot intervals, beginning 25 feet from the test electrode and ending 75 feet from it, in direct line between the ground rod or center of grid and the current reference electrode.

- C. A grounding system that shows greater than 2-ohm resistance, for the flat portion of the plotted data, is considered inadequately grounded. Add additional parallel connected ground rods and/or deeper driven rods until the ground resistance measurements meet the 2-ohm requirement. Additional ground rods and ground grid work will be paid for as extra work. Use of salts, water, or compounds to attain the specified ground resistance is prohibited.

3.05 RECORD DOCUMENTS

- A. Provide Record Drawings and documents maintained and annotated during construction. Submit drawings in accordance with Section 01 77 00 and the following.
- B. Include addendum items, requests for information, change orders, and field changes posted or drawn on the Record Drawings. Include the following drawings with the Record Drawings:
 - 1. Interconnection Diagrams specified herein.
 - 2. Original Submittal Drawings specified herein.
- C. Schedule a meeting with the Engineer in the Engineer's office to review the Record Drawings at the end of the project. Make corrections to the Record Drawings prior to re-submitting the Record Drawings to the Engineer.
- D. Submit Record Drawings and Operations and Maintenance (O&M) Manuals as specified in Sections 01 78 23 and 01 77 00, to be included in the completed project Record Document Set for the Owner.

END OF SECTION 26 05 00.01

26 05 00-A. WIRE AND CABLE RESISTANCE TEST DATA FORM

Wire or Cable No.: _____ Temperature, °F: _____

Location of Test	Insulation resistance, megohms
1.	
2.	
3.	
4.	
5.	
6.	
7.	

CERTIFIED _____ Date _____
Contractor's Representative

WITNESSED _____ Date _____
Owner's Representative

26 05 00-B. INSTALLED MOTOR TEST DATA FORM

Motor Equipment Number: _____ Date of test: _____
 Equipment Driven: _____
 MCC Location: _____

				Ambient temp	°F
Resistance:					
Insulation resistance phase-to-ground megohms:					
Phase A		Phase B		Phase C	
Current at Full Load:					
Phase		Current, amps			
Phase		Current, amps			
Phase		Current, amps			
Thermal Overload Device:	Manufacturer/catalog #			Amperes	
Circuit breaker (MCP) setting:					

Motor Nameplate Markings:

Mfr		Mfr Model		Frame		HP	
Volts		Phase		RPM		Service factor**	
Amps		Freq		Ambient temp rating	°C		
Time rating				Design letter**			
	(NEMA 1-10.35)				(NEMA MG-1.16)		
Code letter				Insulation class			

**Required for 3-phase squirrel cage induction motors only.

CERTIFIED _____ Date _____
 Contractor's Representative

WITNESSED _____ Date _____
 Owner's Representative

DIVISION 31
EARTHWORK

<u>Number</u>	<u>Title</u>
31 41 00	Shoring

SECTION 31 41 00

SHORING

PART 1 GENERAL

1.01 SUMMARY

- A. Scope: This Section specifies requirements for excavation support systems for trenches and open excavations greater than 4 feet in depth and underpinning of existing structures. Where sheet piling, shoring, sheeting, bracing, or other supports are necessary, they shall be designed, furnished, placed, maintained and, unless shown or specified otherwise, removed by the Contractor.

1.02 QUALITY ASSURANCE

- A. Reference Standards:
1. This Section incorporates by reference the latest revisions of the following documents. They are part of this Section insofar as specified and modified herein. In the event of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.
 2. Unless otherwise specified, references to documents shall mean the documents in effect on the effective date of the Agreement. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued.

Reference	Title
Chapter 49.17 RCW	Washington Industrial Safety and Health Act
Chapter 296-155 WAC	Part N, Excavation, Trenching, and Shoring

- B. Contractor's Design Professional
1. Sheeting, shoring, bracing and other supports specified in this Section shall be detailed and designed by the Contractor's Design Professional. The Design Professional shall have active registration in the State of Washington.

1.03 SUBMITTALS

- A. Procedures: Section 01 33 00.
- B. Informational Submittal Items:
1. Detailed excavation support drawings and method of installation and removal of all sheeting, piling, shoring, and bracing, together with underpinning.

2. Design calculations and drawings for proposed sheeting or shoring systems. Calculations and drawings shall be prepared, sealed, and signed by a professional structural engineer registered in the State of Washington; and shall comply with applicable requirements of the referenced codes and rules with respect to excavation and construction.
3. No excavations shall be started until the submittal is returned with a disposition of "Receipt Acknowledged." Review of the submittal will be for the Contractor's general compliance with the Construction Documents and shall not be construed as a detailed analysis for adequacy of the support system, nor shall any provisions of the above requirements be construed as relieving the Contractor of its overall sole responsibility and liability for the Work.

1.04 PERFORMANCE REQUIREMENTS

- A. The design, planning, installation, and removal of all sheeting, shoring, piling, lagging, bracing, and underpinning shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of the soils below and adjacent to the excavation.
- B. The excavation support system design shall meet the requirements of WAC Chapter 296-155, Part N.
- C. Horizontal struts below the barrel of a new pipe and the use of the pipe as trench support are not acceptable.
- D. When the construction sequence of structures requires the transfer of bracing loads or forces to the completed portions of any new structure or to any existing structure, the Contractor shall provide the Engineer with a complete design analysis of the expected impact of that bracing on the structure. This action shall in no way absolve the Contractor of responsibility of damage resulting from said bracing.

1.05 SAFETY RESPONSIBILITIES

- A. The Contractor shall select, install, and maintain shoring, sheeting, bracing, and sloping as necessary to maintain safe excavations. The Contractor shall be responsible for ensuring such measures at a minimum:
 1. Comply with the requirements of the referenced documents and as specified herein.
 2. Provide necessary support to the sides of excavations.
 3. Provide safe access to the Engineer's sampling and testing within the excavation.
 4. Provide safe access for backfill, compaction, and compaction testing.
 5. Otherwise maintain excavations in a safe manner that shall not endanger property, life, health, or the project schedule.

PART 2 NOT USED

PART 3 EXECUTION

3.01 SUPPORT OF EXCAVATIONS

- A. The construction of sheeting, shoring, and bracing shall not disturb the state of soil adjacent to the trench or excavation and below the excavation bottom or footings and utilities in the area. Sheeting, shoring, and bracing shall be removed after placement and compaction of initial backfill as necessary to allow excavation backfill to be placed and compacted against native excavation wall soils, except as noted otherwise.
- B. Where sheeting, shoring, and bracing cannot be removed with the progression of backfill, it shall be designed in such a way that its removal shall not adversely affect the integrity of the pipeline or adjacent structures and the backfill shall be reconsolidated after final removal to the satisfaction of the Engineer.
- C. Where sheeting, shoring, or bracing cannot be removed without resulting in damage to the pipeline or adjacent structure, or where such sheeting, shoring, or bracing is specified or approved by the Engineer to remain, it shall be removed to the maximum extent possible without resulting in damage to the pipeline or adjacent structure and removed from the site. Any shoring that remains shall be cut off a minimum of 4 feet below existing or finish grades, whichever is greater. All voids that exist behind any sheeting or shoring left in place and all voids created by removal of shoring shall be filled in a manner acceptable to the Engineer. All timber associated with sheeting, shoring, or bracing that is proposed to remain shall be pressure treated with a wood preservative.
- D. Provide support of existing structures where shown, specified, and at all other locations where the limit of excavation intersects a 1.5:1 (horizontal: vertical) slope extending from the bottom of the footing or adjacent structure being protected.
- E. Be solely responsible for the adequacy of sheeting, shoring, bracing, and other support utilized in this project. Ensure that the integrity of the existing facilities is maintained and that appropriate construction techniques are employed at all times to protect existing structures and pipes.
- F. Take all necessary measures to protect excavations and adjacent improvements from running, caving, boiling, settling, or sliding soil resulting from high groundwater and/or the nature of the soil excavated.
- G. Be responsible for maintaining a safe work site and shall protect workers and the public health and safety from the consequences of its operations.

3.02 EXISTING PIPING AND UTILITIES

- A. Provide sheeting, shoring, and bracing to protect existing piping and utilities where excavation could expose and/or cause damage to the pipe or utility.

END OF SECTION 31 41 00

DIVISION 43

PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT

<u>Number</u>	<u>Title</u>
43 11 19.13	Centrifugal FRP Fans

SECTION 43 11 19.13
CENTRIFUGAL FRP FANS

PART 1 GENERAL

1.01 DESCRIPTION

- A. This section specifies centrifugal belt-driven fiberglass reinforced plastic (FRP) fans for service of saturated foul air with high concentrations of hydrogen sulfide and organic sulfides, at times containing dilute sulfuric acid, methane, and gasoline vapors. Fans shall be high pressure, backward inclined, or backward curved impeller type.
- B. Equipment list:

Description	Equipment No.
Bioscrubber Odor Control Fan	FAN-13311A

1.02 PERFORMANCE REQUIREMENTS

- A. General:
- Fans specified in this section shall be designed and selected for continuous outdoor operation with air containing corrosive and flammable vapors and gases generated from the treatment and conveyance of municipal wastewater and stabilization and processing of solids from municipal wastewater treatment processes. Vapors and gases may be expected to include methane, hydrogen sulfide, chlorine gas, sulfur dioxide, gasoline vapors, ammonia, and water saturated air. The air stream may also be expected to contain droplets of dilute sulfuric acid. Air stream temperatures are expected to vary between 20 and 100 degrees F.
- B. Operating Requirements:
- The fans shall be selected to achieve the design capacity at no greater than 90 percent of maximum recommended RPM. Fans shall be non-overloading at all points on their curve. Capacity shall be determined in accordance with AMCA Standard 210, cataloged performance licensed to bare the AMCA Rating Seal prior to bid.

Equipment No.	Air Volume, SCFM	Total Static Pressure, in W.C.	Min. Shut off Pr. In W.C.	Max Fan Speed, RPM	Max Fan BHP	Motor Data			Fan Arrangement	NEC Classification
						Max HP	Voltage / Phase	Motor Type		
FAN-13311	1,000	2.4	3.0	2540	1.04	2	480/3	EXP	Belt-Driven,	Class 1, Group D,

Equipment No.	Air Volume, SCFM	Total Static Pressure, in W.C.	Min. Shut off Pr. In W.C.	Max Fan Speed, RPM	Max Fan BHP	Motor Data			Fan Arrangement	NEC Classification
						Max HP	Voltage / Phase	Motor Type		
A									Type 9	Division 2

C. Sound Power Levels:

1. Octave band sound power levels, measured in accordance with ANSI S1-21, ASHRAE 36, AMCA 300, and subsequent revisions of these standards, shall not exceed the following values:

Octave Band Total Sound Power Level, dB (re: 10-12 Watts)									
Equipment No.	Octave Band Center Frequency, hertz								
	63	125	250	500	1,000	2,000	4,000	8,000	Overall
FAN-13311A	57	62	62	65	58	57	52	42	79

2. Fans shall be tested and rated for sound power levels in accordance with AMCA Standards 300 and 301. Sound power rating shall be decibels (reference 10-12 watts) in eight octave bands. Sound dBA levels only are not acceptable.

D. Balance and Vibration:

1. Fans specified in this section shall be balanced at the factory to operate without vibration throughout the full operating range specified. The wheel and shaft shall be dynamically balanced as assembled; the fan shall be balanced in accordance with the limits set forth in AMCA 204, Section 6, Table 6-3 for Industrial and Process and Power Generation equipment level BV-3 (0.15 in/sec. filter-in at both bearing in the horizontal and vertical planes).
2. Centrifugal machines with sleeve bearing shafts shall not exhibit unfiltered RMS readings for vibration displacement in excess of the following:

Shaft speed range, rpm	Displacement, peak to peak, mils
Up to 900	3.5
901 – 1800	3.0
1801 – 3000	2.5
3001 – 4500	2.0
Above 4500	1.6

3. Displacement measurements shall be taken radially on the shaft at two points at each bearing, except for well pumps which shall be measured at top of motor. Measuring points shall be 90 degrees apart.

E. Mounting Requirements:

1. Mount fan and motor on a rigid steel or steel and concrete base. Cast iron bases are not permitted.
2. Mount equipment and base to a vibration isolation system designed to prevent the transfer of vibration and sound to the supporting structure.
3. Select vibration isolators in accordance with unit weight distribution to produce reasonably uniform deflections at each support.
4. Vibration isolation and mounting system shall be designed by a professional engineer qualified in this type of work. Submit calculations for the design, sealed by an engineer registered in the State of Washington.
5. Provide four all-directional seismic snubbers. Design capacity of the snubbers, at 3/8-inch deflection, to be 3 to 4 times the load at the adjacent equipment mount.

1.03 UNIT RESPONSIBILITY

- A. In accordance with Section 44 31 21, the fan, motor, and adjustable frequency drive shall be provided by the odor control bioscrubber manufacturer, who shall be fully responsible for the engineering, design, selection, and operation of all systems and furnished components.
- B. Provide a certification of unit responsibility, as specified in Section 44 31 21, executed by the responsible manufacturer, attesting that the engineering, design, and selection of all systems and components shall be conducted by the respective manufacturers. The Contractor is advised that the Engineer will not process or review any submittal materials unless or until an acceptable certificate of unit responsibility is provided.
- C. Provide qualified installation technicians to supervise unloading, erection, placement, installation, adjustment, testing, and initial start-up of the equipment specified under this section. Nothing in the provision shall be construed as relieving the Contractor of responsibility for the overall quality and completeness of the work.

1.04 QUALITY ASSURANCE

A. References:

1. This section contains references to the following documents. These references are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. If requirements of this section conflict with those of the listed documents, requirements of this section prevail.

2. Unless otherwise specified, reference documents refer to documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if no Bids). If referenced documents have been discontinued by the issuing organization, refer to replacement documents issued or otherwise identified by that organization. If there are no replacement documents, refer to the last version of the document before it was discontinued. Where document dates are given in the following listing, those documents refer to the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued, or replaced.

Reference	Title
AMCA Standard 210	Air Movement and Control Association Test Code and Certified Ratings Program
AMCA Standard 211	Certified Rating Program for Air Moving Devices
AMCA Standard 300	Test Code for Sound Rating
AMCA Standard 301	Methods for Calculating Fan Sound Ratings from Laboratory Test Data
ASTM C582	Standard Specification for Contact Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion Resistant Equipment
ASTM D4167	Fiber-Reinforced Plastic Fans and Blowers
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials.
NEC	National Electrical Code (NEC)

3. Design calculations for vibration isolation and seismic restraint systems specified herein shall be sealed by a professional engineer registered in the State of Washington.

B. Certification:

1. Fan shall bear the AMCA rating seal. Fan shall be from a manufacturer's catalog product that bears the AMCA seal, and is listed on AMCA's web site, prior to bid.

1.05 SUBMITTALS

A. Comply with procedures described in Section 01 33 00.

1. Provide a copy of this specification section (with addendum updates included) and all referenced and applicable sections (with addendum updates included) with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.
 - a. Use check marks (✓) to denote full compliance with a paragraph as a whole.
 - b. Underline and denote with a number in the margin to the right of the identified paragraph requested deviations from the specifications.

Provide a detailed written explanation of the reasons for requesting the deviation. The Engineer shall be the final authority for determining acceptability of requested deviations.

- c. Remaining portions of the paragraph not underlined signify the Contractor's compliance with the specifications.
 - d. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal is sufficient cause for rejection of the entire submittal with no further consideration.
2. Provide a copy of the contract document control diagrams and process and instrumentation diagrams relating to the submitted equipment, with addendum updates applying to the equipment in this section, marked to show specific changes necessary for the equipment proposed in the submittal. If no changes are required, mark the drawing or drawings with "no changes required". Failure to include copies of the relevant drawings with the submittal shall be cause for rejection of the entire submittal with no further review.
 3. Certificate of Unit Responsibility attesting that the Contractor has assigned and manufacturer accepts unit responsibility in accordance with the requirements of this Section and Section 44 31 21. No other submittal material will be reviewed until the certificate has been received and found to be in conformance with these requirements
 4. Performance curves for the specified operation conditions.
 5. Design calculations for vibration isolation and seismic restraint system by a Washington State registered Professional Engineer.
 6. Motor Data certificate conforming to the content, form, and style of form at the end of this section.
 7. Dimensioned drawings including motor V-belt drive and base.
 8. Certification that units have been tested and rated in accordance with the applicable AMCA Standard Test Code and Certified Ratings Program and that they bear the AMCA seal.
 9. Report indicating the unit has been balanced to applicable AMCA Standards.
 10. Sound power level ratings of fan and motor in eight octave bands in accordance with AMCA Standards 300 and 301.
 11. Identify octave band sound power levels generated by the fan with motor at the specified/scheduled operating point.
 12. Manufacturer's operations and maintenance information per section 01 78 23.

1.06 ENVIRONMENTAL CONDITIONS

- A. See Section 44 31 21 for specified environmental conditions.

PART 2 PRODUCTS

2.01 ACCEPTABLE PRODUCTS

A. The Owner and Engineer believe the following candidate manufacturers are capable of producing equipment and/or products satisfying the requirements of this section. This statement, however, shall not be construed as an endorsement of a particular manufacturer's products, nor shall it be construed that a named manufacturer's standard equipment or products will comply with the requirements of this section. Candidate manufacturers include:

1. Hartzell
2. New York Blower
3. Verantis
4. Approved Equal.

2.02 MATERIALS

A. Materials of Construction:

Component	Material
Housing and Wheel	FRP, ASTM C582 and ASTM D4167, Derakane 510 A or Hetron FR992 resin
Door gasket and shaft seal	Neoprene or Teflon
Hub	Aluminum encapsulated in FRP
Bolts	Type 316 stainless steel
Shaft	Type 316 stainless steel
Shaft seal	Teflon

B. FRP Fabrication:

1. Housing
 - a. Flame spread rating ≤ 25 per ASTM E84.
 - b. C-glass veil for corrosion resistance and chopped strand or woven fiberglass for structural core strength.
 - c. Outer layers of 100 percent resin gel coat.
 - d. Inner layer of C-glass corrosion resistant veil followed by another resin rich gel coat layer and another C-glass veil.
 - e. The structural core layer comprises resin and chopped strands or woven fiberglass.
 - f. Total glass content: 30 to 40 percent
 - g. Graphite-impregnated, grounded to prevent static electricity build-up.
2. Wheel
 - a. Flame spread rating of 25 or less per ASTM E84.

- b. The first layer of the wheel laminate is 100 percent resin gel followed by a C-glass corrosion resistant veil followed by another resin rich gel coat and another C-glass veil.
 - c. The structural core consists of chopped strand or woven fiberglass and resin followed by a C-glass veil, a resin rich gel coat, another C-glass veil and a final 100 percent gel coat.
 - d. Total glass content: 30 to 40 percent
 - e. Graphite impregnated, grounded to prevent static electricity build-up.
 - f. Select a fan wheel of a backwardly inclined, non-overloading design. Wheel hub shall be permanently bonded to the shaft and completely encapsulated in FRP to insure corrosion-resistant integrity. Steel wheels coated with FRP, or wheels with taper-lock hubs are not acceptable.
- 3. Type
 - a. Comply with construction type and material thickness requirements in accordance with ASTM D4167.
 - 4. Shaft
 - a. Type 316 stainless steel shaft. Ensure that the shaft's first critical speed is at least 125 percent of fan's maximum operating speed, and countersunk for tachometer readings.

2.03 CONSTRUCTION

A. Fan:

- 1. Select fans designed for rated pressure, V-belt driven, of centrifugal design with backward inclined or backward curved impellers. The fan wheel shall be the overhung type with at least two pillow block bearings located away from the air stream. Configure fan and motor as indicated in paragraph 1.02. Use bearings rated for a minimum AFBMA L-10 bearing life of 50,000 hours of operation. Select a shaft hub and bushings completely encapsulated in a reinforced plastic laminate. Shaft and wheel are to be permanently affixed as one unit. Provide an FRP sleeve extending from the back plate of the wheel through the fan housing for protection of the fan shaft. The rotor shall be dynamically balanced after fabrication.
- 2. Provide the fan with a 2-inch FRP drain at the lowest point of the scroll housing. Fit drain with a ball valve and P-trap.
- 3. Unless shown otherwise on the drawings, provide plain flanged round inlets and outlets suitable for use with flexible connections. All flanges shall be factory drilled. Use stainless steel fasteners. Use a steel-fabricated, adequately braced base equipped with lifting eyes. Provide a 6-inch diameter inspection port cleanout door.

B. Fan Sound Attenuation Package:

- 1. Provide a system with a fan sound attenuation package for each fan. The package shall consist of a rigid acoustical enclosure placed over the fan and motor assembly.

2. Construct the acoustical enclosure as follows:
 - a. Use fire-retardant (Class 1) FRP.
 - b. Sides and top of FRP corrosion resistant housing is designed to have a maximum deflection of L/360 under a 250/square foot load. Top and sides shall be 0.75" thick.
 - 1) A thinner outer skin may be provided with the addition of FRP pultruded structural members. If this option is selected, submit structural design calculations as part of the submittal package. The design engineer shall be registered in the State of Washington. Design calculations shall include data showing the alternative construction will meet the below-specified sound depletion requirements.
 - 2) Construct enclosure with a 1/2 inch-base flange with thermoplastic surface. Ensure base flange is a minimum 5 inches wide.
 - 3) Coat all exterior surfaces with a two-part epoxy paint system. Gelcoat is not acceptable. Color shall be selected by the owner prior to coating. This coating system shall be part of the submittal package including color chart and performance data. Coating shall be shop-applied.
 - c. Sound enclosure options
 - 1) Three (3) side and one (1) top-mounted hinged access manways with stainless fasteners and hinges
 - a) Provide access manways for easy access to fan motor.
 - b) Gasket manways with acoustic material on all interior surfaces.
 - 2) Center separation flange
 - a) Select a sound enclosure manufactured with a complete body flange on c/l with the duct outlet. This flange shall allow the enclosure to be separated and removed without breaking any ductwork connections.
 - b) Select a 1/2 inch-thick flange with gasket and stainless fasteners.
 - 3) FRP flashing
 - a) Provide where ductwork penetrates sound enclosure.
 - b) Use flashing with gaskets to prevent sound loss.
 - c) Assemble with 316 stainless hardware.
 - 4) Fit enclosure with an acoustical louvered vent for air intake and exhaust fan for heat dissipation, as specified on contract drawings.
 - d. Acoustic insulation and performance
 - 1) Coat all internal surfaces with a dense sound barrier material and 1 ½ inch-thick acoustic insulation.
 - 2) Secure barrier and insulation in place with 316 stainless fasteners and pultruded vinyl-ester structural members.

- 3) Design enclosure to provide 20 dB noise reduction at normal fan operating conditions.

C. Accessories:

1. Flexible connections
 - a. For each fan, provide flexible connections at fan inlet and discharge.
 - b. Match fan inlet dimensions or fan outlet dimensions.
 - c. Bellows type with flanged end connections and backing flanges.
 - d. New York Blower, U.S. Bellows, or Approved Equal.
2. Mounting
 - a. Mount fans with seismic restraints as specified in this Section.
 - b. Use height-saving type mountings.
 - c. Use seismic restraints designed for a 4g lateral acceleration.
3. Pressure gauges
 - a. Provide one static pressure gauge at both the inlet and outlet to measure the air pressure drop across the fan.
 - b. Select an industrial grade gauge with an accuracy of +/- 2 to 3 percent of full scale.
 - c. Select a gauge stainless steel or aluminum housing, manufactured by Dwyer or equal.
 - d. Mount gauges 48 to 60 inches from ground level for easy viewing on wall, or provide a stainless steel stanchion.
 - e. Provide stainless steel tubing for sensing lines, and arrange drains on sensing lines to prevent condensate build up, gauge damage, and false gauge readings.
4. Provide a flanged inlet and outlet. Drill flange.
5. Provide Teflon shaft seal.
6. Provide adjustable V-belt drive.
7. Provide safety equipment including belt guard, shaft guard, and coupling guard.
8. Provide unitary base with spring isolators.

2.04 DRIVE UNIT

- A. Select a V-belt fan driven by an electric motor mounted on a common base. The mounting plates shall be slotted to allow tension adjustment of the drive belts and a belt guard shall be supplied. The fan shall be provided with adjustable motor base.
- B. Provide electric motors as specified in Section 26 05 00.01: Common Work Results for Electrical for Small Projects.
 1. Electric motors shall be compatible with adjustable frequency drives.
 2. Electric motors shall have low noise characteristics. Motor sound levels shall not exceed 80 dBA when measured in accordance with IEEE No. 85

"Test Procedures for Air Borne Noise Measurements on Rotating Machinery" over the specified motor speed range.

C. Provide an adjustable frequency drive as specified in Section 26 05 00.

2.05 MOUNTING

A. Vibration isolation mountings and seismic restraints shall be as manufactured by Mason Industries, Inc., Korfund Dynamics Corporation, or Consolidated Kinetics Corporation.

B. Features:

1. Mounting Requirements: Unless the equipment incorporates unit construction using an integral rigid frame or is specified otherwise, each item of mechanical equipment, along with its drive unit, shall be mounted on a rigid steel or steel and concrete base. Cast iron bases are not permitted when equipment is furnished with a vibration isolation system. Where specified, the equipment, including the base, shall be mounted on or suspended from vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the supporting structure. Vibration isolation available internally in the equipment will not be considered equivalent and shall not be provided when vibration isolation as specified herein is required. Normally provided internal vibration isolators shall be replaced with rigid supports in such cases. Vibration isolators shall be selected in accordance with unit weight distribution to produce reasonably uniform deflections at each support. Unless otherwise specified, bases, isolators, and deflections shall be as specified in Table 27, ASHRAE CH-52.
2. Design Requirements: The Contractor shall cause all vibration isolation systems, including the isolators, seismic restraints and flexible connectors between the isolated equipment and associated piping, ducting and/or electrical work, to be designed by a professional engineer qualified in this type of work. This provision, however, shall not be construed as relieving the Contractor of his overall responsibility for the work. The Contractor shall submit a copy of the engineer's calculations for design of the vibration isolation systems, sealed by an engineer registered in the State of Washington. Flexible connectors shall be provided by the manufacturer of the mechanical equipment item in accordance with the recommendations of the vibration isolation system engineer.

C. Seismic Restraints:

1. General:
 - a. Restraint devices shall resist the forces specified and shall be designed in accordance with the Structural Notes on the Drawings. Design lateral forces shall be distributed in proportion to the mass distribution of the equipment.
2. Floor Mounted Equipment:

- a. Equipment and appurtenances resiliently floor mounted on spring or pad type vibration isolators, except for curb mounted equipment, shall be provided with seismic snubbers. Equipment shall receive four all-directional restraint/snubbers. The capacity of snubbers, at 3/8-inch deflection, shall be 3 to 4 times the load at the adjacent equipment mount.
 - 1) Restraint assembly for floor mounted equipment shall consist of welded steel interlocking assemblies welded or bolted securely to the equipment or the equipment bases and the supporting structure. Restraint assembly surfaces which engage under seismic motion shall be lined with a resilient elastomer, 3/4 inches thick. Restraints shall be field adjustable and be positioned for 1/4-inch clearance both vertically and horizontally or clearance as required to prevent interference during normal operation, stopping, or starting. Restraint assembly shall have a minimum rating of g based on independent test data.
- D. Equipment base: Type I bases shall be structural steel bases. The bases shall be rectangular in shape for all equipment other than centrifugal refrigeration machines and pump bases, which may be "T" or "L" shaped. All perimeter members shall be beams with a minimum depth equal to 1/10 of the longest dimension of the base. Beam depth need not exceed 14 inches provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer. Height saving brackets shall be employed in all mounting locations to provide a base clearance of 1 inch.
- E. Vibration isolation mountings: Mountings shall be free-standing spring type isolators laterally stable without any housing and complete with 1/4-inch neoprene acoustical friction pads between the base and the support. Mountings shall have leveling bolts that must be rigidly bolted to the equipment. Spring diameters shall be no less than 0.8 times the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50 percent of the rated deflection. Mountings shall be hot-dip galvanized steel.

2.06 CONTROLS

- A. Fan controls are provided under Section 44 31 21.

2.07 PRODUCT DATA

- A. Comply with procedures described in Section 01 33 00.
 - 1. Provide all operations and maintenance information as specified in Section 01 78 23.
 - 2. Provide Manufacturer's Certificate of Proper Installation Form 01 43 33-A in accordance with Section 01 43 33.
 - 3. Provide Equipment Testing and Startup Forms in accordance with Section 01 91 14.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Connect and install fan as shown on drawings and in accordance with the manufacturer's printed instructions.
- B. Equipment Mounting:
 - 1. Install vibration isolation base and vibration isolators such that fan is installed level. Provide level bearing surface for fan base at housekeeping pad.
 - 2. After fan base has been set in position and aligned, grout the space between bottom of vibration pad and housekeeping pad with a poured, non-shrinking grout as specified on the Drawings.
- C. Seismic restraints shall be securely anchored or fastened to the equipment and supporting structure in accordance with approved submittal data. Operating clearances shall be adjusted so that restraints do not interfere during normal operation of the equipment.

3.02 TESTING

- A. Dynamically balance each fan in accordance with ASTM D4167 at the specified operating speed.
- B. Submit fan to factory testing in an AMCA-approved laboratory for air and sound performance. Provide results to Engineer. Engineer may witness the tests; provide two weeks' notice of testing.
- C. After completion of installation, subject each fan to field testing in accordance with Section 01 91 14 to guarantee compliance with drawings and requirements of this specification.

3.03 TRAINING

- A. A minimum of 4 hours of training shall be provided by the fan manufacturer's service representative. Training shall conform to Section 01 43 33.

3.04 SPECIAL WARRANTY

- A. Fan manufacturer shall warrant all components free from manufacturing and material defects for a period of two years after completion of Functional Testing per Section 01 91 14 as evidenced by Engineer's and Owner's signatures as witnesses on Equipment Test Report.

END OF SECTION 43 11 19.13

MOTOR DATA FORM

Equipment Name:

Equipment No(s):

Project Site Location:

Nameplate Markings

Mfr:		Model:		Frame:			Horsepower:	
Volts:		Phase:		RPM:			Service Factor:	
FLA:		LRA:		Frequency:			Amb Temp Rating:	°C
Time rating: (NEMA MG1-10.35)						Design Letter: (NEMA MG1.16)		
KVA Code Letter:						Insulation Class:		

The following information is required for explosion-proof motors only:

- A. Approved by UL for installation in Class _____, Div _____, Group _____
- B. UL frame temperature code _____ (NEC Tables 5008B)

The following information is required for all motors 1/2 horsepower and larger:

- A. Guaranteed minimum efficiency _____
- B. Nameplate or nominal efficiency _____

Data Not Necessarily Marked on Nameplate

Type of Enclosure:			Enclosure Material:		
Temp Rise:			°C (NEMA MG112.41,42)		
Space Heater included?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If Yes:	Watts	Volts	
Type of motor winding over-temperature protection, if specified:					

Provide information on other motor features specified:

DIVISION 44

POLLUTION AND WASTE CONTROL EQUIPMENT

<u>Number</u>	<u>Title</u>
44 31 21	Bioscrubber Odor Control Equipment

SECTION 44 31 21
BIOSCRUBBER ODOR CONTROL EQUIPMENT

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope:

1. This section specifies an odor control bioscrubber (also referred to as a biotrickling filter in similar installations) for hydrogen sulfide (H₂S) and odor reduction.

B. Basis of Design Manufacturer:

1. This specification and the Drawings depict a complete odor control bioscrubber design based around the Basis of Design Manufacturer - Ecoverde, Phoenix, Arizona. Layout, supports, components, controls, utility requirements, and other features of the Work will differ from that shown in the Contract Documents to accommodate Substitute or Alternate Odor Control Bioscrubber Manufacturers.
2. No substitutions allowed unless approved by the Engineer prior to bidding per Supplementary Conditions SC-1.04.
3. The Drawings and Specifications contain pertinent details, performance criteria, quality, function, and requirements for materials and methods to achieve Work described that is common between odor control bioscrubber manufacturers. Adherence to the criteria will be evaluated in:
 - a. Substitution requests prior to bidding in accordance with the Supplementary Conditions SC-1.04 and Section 01 25 00; and
 - b. Through submittal of design data, deviations, and details for alternate manufacturers named in this specification following contract award in accordance with Section 01 25 00 and the submittal process specified in Section 01 33 00.

C. Unit Responsibility:

1. The Contractor will assign unit responsibility as specified in this section to the odor control bioscrubber manufacturer for provision of new odor control bioscrubber and related equipment.

D. Type:

1. The Contractor will install the bioscrubber odor control equipment in a permanent outdoor location. The following describes the limits of the bioscrubber odor control system that is to be provided:
 - a. Foul air will be conveyed through ducting to the bioscrubber as shown on the Drawings.
 - b. The odor control bioscrubber manufacturer scope of supply is depicted on the Drawings.

2. The system provided by the bioscrubber manufacturer will include—but not be limited to an FRP odor fan per Section 43 11 19.13, foul air dampers, reactor vessel, chemical-resistant media and support grating, recirculation pump, internal piping, mist eliminator, spray system, nutrient feed system, instruments, electrical controls, system control panel with remote input/output (RIO) hardware, valves, nutrient-rich solution pumps, a nutrient tank, access ladder and platforms, duct supports from reactor vessel, and all necessary appurtenances specified herein.
3. The bioscrubber will be oriented in a vertical tower structure and use inert media that promotes efficient facilitation of mass transfer of vapor-phase odorous compounds and growth of bacteria to oxidize odorous compounds.
4. The bioscrubber system will include the capability of continuous injection of a nutrient-rich solution into the irrigation spray water. Provided that performance requirements per this specification are met, continuous recirculation of the nutrient-rich solution is not required.

E. Equipment List (For Basis of Design Odor Control Bioscrubber Manufacturer, other manufacturers may vary):

Equipment Number	Item
FAN-13311A	Foul Air Fan
PI-13311A	Foul Air Fan Pressure Indicator
TSH-13311A	Foul Air Fan Motor High Temperature Switch
LCP-13311A	Foul Air Fan Local Control Panel
VFD-13311A	Foul Air Fan Variable Frequency Drive
SCB-13311	Bioscrubber
PDI-13311	Bioscrubber Differential Pressure Indicator
LSHH-13311	Bioscrubber Sump High Level Switch
PMP-13322	Recirculation Pump
TSH-13322	Recirculation Pump High Temperature Switch
VFD-13322	Recirculation Pump Variable Frequency Drive
CPL-13372	Irrigation Control Panel
VLV-13311D	Makeup Water Control Valve
FE-13311E	Makeup Water Flow Meter
FIT-13311E	Makeup Water Flow Transmitter
FI-13311	Makeup Water Flow Indicator
PDI2-13311	Mist Eliminator Differential Pressure Indicator
TNK-13312	Nutrient Tank
PMP-13321	Nutrient Pump
RCM-17434B	Bioscrubber System Control Panel
RIO-17534B	Bioscrubber System Remote I/O
AE-13311F	Bioscrubber Sump Drain pH Analyzer
AIT-13311F	Bioscrubber Sump Drain pH Transmitter
TI-13311I	Bioscrubber Inlet Temperature Indicator
TI-13311J	Bioscrubber Outlet Temperature Indicator

1.02 QUALITY ASSURANCE

- A. Reference Standards: This section incorporates by reference the latest revisions of the following documents. They are part of this section insofar as specified and modified herein. In the event of a conflict between the requirements of this section and those of the listed documents, the requirements of this section prevail. Unless otherwise specified, references to documents will mean the documents in effect on the effective date of agreement. If referenced documents have been discontinued by the issuing organization, references to those documents will mean the replaced documents issued or otherwise identified by that organization, or if there are no replacement documents, the last version of the document before it was discontinued.

Reference	Title
ASTM D1998	"Standard Specification for Upright Polyethylene Storage Tanks"
ASTM D2563	"Standard Practice for Classifying Visual Defects in Glass Reinforced Plastic Laminate Parts"
ASTM D2584	"Standard Test Method for Ignition Loss of Cured Reinforced Resins"
ASTM D3299	"Standard Specifications for Filament-Wound Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks"
ASTM D4097	"Standard Specification for contact-molded glass-fiber-reinforced Thermoset Resin Corrosion-Resistant Tanks"
ASTM D5504	"Standard Test Method for Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence"
ASTM E679	"Standard Practice for Determination of Odor and Taste Thresholds by a Forced-Choice Ascending Concentration Series Method of Limits"
ASTM EN 13725	"Air Quality Determination of Odour Concentration by Dynamic Olfactometry"
NBS: PS 15	"Custom Molded Reinforced Polyester for Chemical Resistant Process Equipment"
ISO 9001	"International Organization for Standardization"

B. Related Sections:

1. General and Supplementary Conditions
2. Division 1 of the specifications
3. Section 23 31 16.16: Thermoset Fiberglass Reinforced Plastic Ducts
4. Section 26 05 00.01: Common Work Results for Electrical for Small Projects
5. Section 43 11 19.13: Centrifugal FRP Fans

C. Factory Testing:

1. General: Factory test all equipment for compliance with the requirements specified herein and submit a certificate for the results of these tests to the Owner upon delivery. In addition, conduct the tests specified below.
2. Burn Tests: Perform a minimum of two burn tests from nozzle cutouts on each vessel to verify the glass:resin ratio.
3. Leak Test: Perform a 4-hour fully hydrostatic atmospheric leak test for the sump area. Zero leakage is allowed.
4. Perform a pressure test under pressure and vacuum conditions. Verify the design strain by strain-gauge testing during this test.

D. Source Quality Control:

1. Equipment Inspection: The odor control bioscrubber manufacturer's facility will be in compliance with International Organization for Standardization (ISO) 9001. The manufacturer will designate one employee as inspector, who will be present at each fabrication step, and will have at least 10 years of FRP inspection experience. The inspector will keep a log of all activities performed and the progress of each vessel. Provide each piece of equipment that is delivered has a transmittal letter, signed by the inspector, which notes that the equipment has met the specifications.

E. Shipment and Storage:

1. Adhere to the odor control bioscrubber manufacturer's recommendations on shipping and handling and procedures, as recommend by the Society of the Plastics Industry (SPI) "Recommended Practice for Shipping and Installation of Reinforced Plastic Tanks," and as described in National Bureau of Standards (NBS) PS15 and American Society of Testing and Materials (ASTM) D4097.

F. Special Warranties:

1. Provide an extended guarantee or warranty, with the Owner named as beneficiary—in writing—as a special guarantee. Ensure that the extended guarantee provides for correction, or at the option of the Owner, removal and replacement of work specified in this section that is found defective during a period of five years after the date of acceptance of the odor control system. Duties and obligations for correction or removal and replacement of defective work will be as specified.
2. Warrant bioscrubber media against subsidence greater than 5 percent, biological fouling, and lack of performance for a period of 15 years beginning after acceptance of the odor control system. Have the Owner operate the bioscrubber in accordance with the manufacturer's operation and maintenance (O&M) information, data, and guidelines as listed in the O&M Manual per Section 01 78 23.

G. Qualifications:

1. Ensure that the odor control bioscrubber manufacturer is recognized in the design, production, and operation of bioscrubber systems in the United States. Ensure that the process designer used by the manufacturer for this work has at least 10 years of experience in design and fabrication of FRP bioscrubber systems similar to the type specified for this section, with either their present or previous employer.
2. Ensure that the odor control bioscrubber manufacturer's place of business and vessel manufacturing facility are open for inspection. Ensure that the Vendor is capable of providing the Owner with training and monitoring support on 3 days' notice during the first year of operation.

3. Ensure that the odor control bioscrubber manufacturer provides a list of at least five different locations where its equipment has been installed, is currently in service, and has been in service for at least 5 years. Ensure that the installations provided are bioscrubbers associated with the removal of hydrogen sulfide and/or typical organic municipal wastewater odors, and that they have odor performance requirements similar to those specified in this section. Two of the five references must have an air flow capacity at least equal to that in this project.

H. Unit Responsibility:

1. The Contractor shall cause equipment assemblies made up of two or more components to be provided as a working unit by the unit responsibility manufacturer, where specified. The unit responsibility manufacturer shall coordinate selection, coordinate design, and shall provide all mechanical equipment assembly components such that all equipment components furnished under the specification for the equipment assembly, and all equipment components specified elsewhere but referenced in the equipment assembly specification, is compatible and operates reliably and properly to achieve the specified performance requirements. Unless otherwise specified, the unit responsibility manufacturer shall be the manufacturer of the driven component equipment in the equipment assembly. The unit responsibility manufacturer is designated in the individual equipment specifications found elsewhere in this project manual. Agents, representatives or other entities that are not a direct division of the driven equipment manufacturing corporation shall not be accepted as a substitute for the driven equipment manufacturer in meeting this requirement. The requirement for unit responsibility shall in no way relieve the Contractor of his responsibility to the Owner for performance of all systems as provided in the General Conditions of the Contract Documents.
2. The Contractor shall ensure that all equipment assemblies provided for the project are products for which unit responsibility has been accepted by the unit responsibility manufacturer(s), where specified. Unit responsibility for related components in a mechanical equipment assembly does not require or obligate the unit responsibility manufacturer to warranty the workmanship or quality of component products not manufactured by them. As required in this Section, furnish a certificate conforming to the content, form, and style of form at the end of this section. The form shall be signed by an officer of the unit responsibility manufacturer's corporation and shall be notarized. No other submittal material will be processed until a Certificate of Unit Responsibility has been received and has been found to be satisfactory. Failure to provide acceptable proof that the unit responsibility requirement has been satisfied will result in withholding approval of progress payments for the subject equipment even though the equipment may have been installed in the work.

1.03 ENVIRONMENTAL CONDITIONS

- A. Odor control bioscrubber equipment will be installed outdoors, with direct exposure to all sun and weather elements. The air that will be treated by the equipment is corrosive in nature. Airstream will include hydrogen sulfide, sulfuric acid droplets, reduced organic sulfur compounds, and ammonia.

1.04 SUBMITTALS

A. Provide the following submittals in accordance with Section 01 33 00:

1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. A check mark (✓) will denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and thus requested by the Contractor, underline and denote by a number in the margin to the right of the identified paragraph each deviation, referenced to a detailed written explanation of the reasons for requesting the deviation. The Owner will be the final authority for determining acceptability of the requested deviations. The remaining portions of the paragraph that are not underlined will signify compliance on the part of the Contractor with the specifications. *Failure to include a copy of the marked-up specification sections—along with justification(s) for any requested deviations to the specification requirements—with the submittal will be sufficient cause for rejection of the entire submittal with no further consideration.*
2. A completed Certificate of Unit Responsibility attesting that the Contractor has assigned, and that the manufacturer accepts, unit responsibility in accordance with the requirements of this section. *No other submittal material will be reviewed until the certificate has been received and found to be in conformance with these requirements.*
3. Detailed structural and mechanical layout drawings showing system fabrication, dimensions, size, and locations of connections to other work and fully describing system operation.
4. Complete process and mechanical design calculations for the odor control system, including annual utility costs, bioscrubber vessel pressure drop calculations, calculations showing that the media (as provided) will meet the required performance criteria, the anticipated nutrient feed requirement based upon design air flow rate, and H₂S inlet concentrations as specified in this section.
5. Shop drawings including the make, model, weight, and horsepower of each equipment assembly. Include odor control bioscrubber manufacturer's catalog information, descriptive literature, specifications, and identification of materials of construction.
6. Detailed product information for the odor control bioscrubber media proposed for the work, as well as total shipped and operating weight of the media bed.

7. Structural calculations and drawings that include, but are not limited to, dead loads, live loads, environmental loads (e.g., wind, seismic), the anchor lug attachment to shells, ladder and platform attachments, anchor bolt size, and embedment requirements. Consider the effect of all cutouts and openings into the vessel wall. Verify attachment lugs for piping, structural members and other appurtenances, media support design, the deflection of the vessel at the point of connection with the ductwork, and all material property values used for structural calculations by actual physical tests on similar types of laminates. Submit test data with all structural calculations. Ensure that all structural drawings and calculations are signed and sealed by a professional engineer registered in the state of Washington. Clearly list the structural design criteria at the beginning of the structural calculations.
8. A certificate from the resin manufacturer listing the nomenclature, composition, and characteristics of the resin furnished with the bioscrubber vessel.
9. A reference list of five existing projects where similar equipment by the odor control bioscrubber manufacturer is currently in service. Provide the length of service, facility names, telephone number, and mailing addresses of the design engineer, Owner, and installation Contractor for each reference.
10. A copy of the fiberglass fabrication Quality Assurance (QA) procedures as specified in this section.
11. Process and instrumentation drawings (P&IDs) showing all components, air and liquid flow rates, and unit requirements.
12. Vessel data indicating the pressure rating, diameter, straight lengths, overall lengths, and wall thickness with the odor control bioscrubber manufacturer's information on the media, including air pressure drop data through media and mist eliminator measured at the design airflow rate and proposed media depth and media volume.
13. Operating data from previous installations to substantiate media performance.
14. External utility requirements such as air, water, power, drain, etc., for each component.
15. Confirmation that the foul air delivery system to the bioscrubber shown on the contract drawings is acceptable.
16. Functional description of internal and external instrumentation and controls to be supplied, including the list of parameters monitored, controlled, or alarmed along with control panel elevation drawings showing construction and placement of operator interface devices and other elements.
17. Power and control wiring diagrams, including terminals and numbers and shop and field painting systems: which include the odor control bioscrubber manufacturer's descriptive technical catalog literature and specifications.
18. Marked product literature of all instrumentation to be provided.
19. The odor control bioscrubber manufacturer will provide all documentation in sufficient detail to allow the Owner's programmer to program the process control system (PCS) to provide automatic control and monitoring of equipment as described in this section, including, but not limited to:
 - a. associated motor elementary drawings,
 - b. loop drawings,
 - c. programmable logic controller (PLC) card drawings,

- d. P&IDs,
 - e. network drawings,
 - f. I/O list,
 - g. control strategies,
 - h. typical programming logic,
 - i. typical programming code, and
 - j. human-machine interface (HMI) development files.
 - k. List of minimum data exchange parameters between the Vendor system and PCS to meet the monitoring and control requirements of the Vendor system control strategy.
 - l. List of all available data exchange parameters from the Vendor system and all Vendor provided networked equipment, e.g., VFDs, instruments.
20. Following programming of the PCS and observation of the system operating in automatic mode, submit letter of warrantability indicating that the observed programming meets the odor control bioscrubber manufacturer's standards and represents a complete and warrantable system.
 21. Qualifications of the FRP inspector as specified in this section.
 22. Qualifications, projects, and resume of the process designer as specified in this section.
 23. Detailed factory testing plan, which includes test equipment used and sampling and analysis procedures.
 24. A detailed description of the procedure for installation and commissioning of the bioscrubber odor control system.
 25. Manufacturer's Installation Certification and Instruction Certification Form 01 43 33-A.
 26. Factory test results as specified in Paragraph 1.02.
 27. Detailed performance testing plan, which includes the test equipment used and sampling and analysis procedures.
 28. Calibration and setup procedures and specific testing methodology used for performance testing along with the sampling and analysis procedures.
 29. Per Paragraph 3.03, a final report consisting of a narrative of the sampling activities; a copy of the original sampling log; photographs showing the locations of velocity and pressure measurements; a tabular summary of velocity, airflow rates, pressures, H₂S and odor removal data; calculated results; and the conclusions of these results. If necessary, the report will be revised in accordance with written comments from the Owner and resubmitted.
 30. Manufacturer's recommended spare parts list.
 31. O&M information specified in Section 01 78 23. Provide the following additional content:
 - a. Safety Data Sheets (SDS) for each material used in the bioscrubber
 - b. Maintenance, repair, and replacement procedures of the bioscrubber system and emergency adsorption including the medias used to control emissions.
 - c. Compliance testing procedures and methods used to meet the requirements in Paragraph 3.03.
 - d. Monitoring equipment routine maintenance procedures.

- e. Procedures to correct known malfunctions of the bioscrubber system, mist eliminator, and monitoring equipment.
- f. Procedures to correct operation of odor control equipment when operation deviates from the established parameter ranges as follows:
 - 1) Outside of pH range recommended by the bioscrubber manufacturer.
 - 2) Inlet temperature is below 40 deg F or exceeds 120 deg F.
 - 3) Minimum and maximum pressure differential pressure across the media bed(s) in the bioscrubber system is outside of range recommended by the bioscrubber manufacturer.

B. See Section 01 25 00 for additional submittal requirements for accepted substitute and alternate manufacturers other than the Basis of Design Manufacturer.

1.05 PERFORMANCE REQUIREMENTS

A. Service Conditions: Ensure that the equipment is be suitable for installation and service at a wastewater treatment plant, under the environmental conditions specified in Paragraph 1.03.

B. Operating Conditions (does not vary between manufacturers):

Operating Condition	Value
Number of bioscrubbers	1
Total airflow range, cfm	300 - 1,100
Average inlet H ₂ S concentration range, ppm	80
Peak inlet H ₂ S concentration, ppm	300
Average inlet relative humidity range, percent	60-100
Inlet air temperature range, degrees Fahrenheit (°F)	40-120

C. Design Requirements (may vary between manufacturers):

Design Requirement	Value
Location	Outdoors
Vessel type	Round, vertical
Vessel material of construction	FRP per ASTM D3299, premium, corrosion resistant, flame retardant, vinyl ester resin, Derakane 510 A or Hetron FR992
Bioscrubber media type	Synthetic material
Vessel diameter, maximum, feet	7.5-feet
Vessel height, not including stack, maximum, feet	16-feet
Inlet flange diameter, in.	14
Outlet flange diameter, in.	12
Recirculation flowrate ¹ range, gpm	0-18
Makeup water flowrate ² range, gpm	0-18
Pressure rating, in. w.c.	0 to +5

4. Recirculation not required, provided performance requirements are met per Paragraph 1.05.

5. *Makeup water rate is equivalent to media irrigation rate for systems that do not use liquid recirculation.*

D. Performance Requirements (does not vary between manufacturers):

Operating Condition	Value
Minimum empty bed residence time (EBRT), seconds	16
Max air pressure drop, inlet flange to outlet flange, in. w.c.	1.0
Minimum H ₂ S removal efficiency when inlet H ₂ S concentration is greater than or equal to 5 ppm, %	99
Maximum outlet H ₂ S concentration when inlet H ₂ S concentration is less than 5 ppm, ppm	0.1
Minimum odor ¹ removal efficiency when inlet odor ¹ is greater than or equal to 1,000 D/T, %	80
Maximum outlet odor ¹ when inlet odor ¹ is less than 1,000 D/T, D/T	300

1. *Measured by a certified odor panel per ASTM E679 and ASTM EN13725.*

E. Seismic Anchorage and Structural Requirements (does not vary between manufacturers):

1. Anchor and brace the mechanical, instrumentation and control, electrical, non-structural systems, components, and elements permanently attached to the structure to resist seismic and wind forces. Design in accordance with STRUCTURAL NOTES on the Drawings: the structural components, seismic attachments, braces, and anchors to the structure for all parts or elements of the mechanical and electrical systems. Submit anchorage calculations, sealed by an engineer registered in the state of Washington, for review.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The Owner believes that the following candidate manufacturers are capable of producing equipment and/or products that will satisfy the requirements of this Section. However, this statement should not be construed as an endorsement of a particular manufacturer's products, nor should it be construed that the named manufacturers standard equipment or products will comply with the requirements of this section:
1. The Basis of Design Manufacturer is Ecoverde, Phoenix, Arizona.
 2. Alternate Manufacturers are 1) BioAir, Voorhees, New Jersey, and 2) Biorem, Puslinch, Ontario.
 3. To conform with specified requirements, the odor control bioscrubber manufacturer's standard product and offerings may require modification.
 4. Contractor is responsible for adapting the complete odor control bioscrubber design as specified and shown in the Contract Documents to meet approved Substitute and Alternate Odor Control Bioscrubber Manufacturer's equipment, in accordance with Section 01 25 00; at no additional cost to the City.

2.02 MATERIALS AND FEATURES

- A. General:

1. Provide a system consisting of a bioscrubber vessel, chemically resistant media and support grating, piping, spray system, mist eliminator, nutrient feed system, electrical controls, instruments, valves, sump and recirculation pump (if applicable to the system), a nutrient tank, inlet and outlet connections, access ladders and platforms, duct supports where ducts are specified to be supported from the reactor vessel on the drawings, and all necessary appurtenances specified herein. Include system fabrication details and materials in the shop drawings and submit them for approval before fabrication. Obtain all equipment that is specified herein from one manufacturer to achieve standardization of appearance, operation, maintenance, spare parts, and services.
2. Ensure that the odor control bioscrubber manufacturer coordinates the electrical, mechanical, and structural interfaces among all equipment that is required for a complete functioning odor control system. Include in the design the entire odor control system and coordination of all items, including bioscrubber vessels and media, odor fan, the recirculation pump, instrumentation and controls, and all appurtenances necessary for the complete system.
3. This section specifies the minimum system operating requirements, and descriptive specifications are given for all major components of the system. All components that are necessary for a functioning system will be provided. Piping and cable and conduit runs that are shown are based upon the basis of design odor control bioscrubber manufacturer's information that was provided during the preparation of the contract documents. No additional compensation will be made for changes that are required to install the system to meet functional specifications.

B. Bioscrubber Vessel:

1. Cylindrical with upward air flow and countercurrent liquid flow.
2. Filament wound FRP, with seamless, continuously molded corrosion liner through knuckle to vessel base.
3. Design the vessel for negative pressure service conditions as specified for Type II Grade 1 tanks in ASTM D3299. Include a 10:1 safety factor for internal pressure loadings; include a 5:1 safety factor for external and vacuum loadings.
4. Minimum filament wound laminate properties per ASTM D3299.
5. Visual Defects: Meet requirements of Table 5 in ASTM C582.
6. Maximum flame spread index of 25 when tested per ASTM E84 Tunnel Test
7. Maximum smoke development rating of 50 for vessel exterior when tested per ASTM E84 Tunnel test. Gel coat for UV inhibition; color selection by Owner.
8. Preassemble vessel components at the point of fabrication. Preassembly will not require all joints to be factory assembled, but prepare all joints for field fabrication. Number each matched piece. Protect FRP from atmospheric or otherwise induced conditions of adverse temperatures, moisture, wind, or blowing dust and sand and other contaminants that would adversely affect the laminate or joint construction. Provide the protective means during the construction and curing period.
9. Ensure that the structural aspects of the vessel are sufficient to meet the code-recommended requirements, including relevant seismic requirements for all conditions during the design life. Ensure that the requirements are in accordance with STRUCTURAL NOTES on the Drawings.

10. Ensure that the minimum required dimensions, tolerances, and wall thickness for the cylinder straight shell are sufficient to support its own weight in an upright position without any external support. Take all dimensions with the tank in the vertical position, unfilled. Ensure that the tolerance for the outside diameter, including out-of-roundness, is per ASTM D1998. Ensure that the tolerance for fitting placements is plus or minus elevation 0.5 inch and 2 degrees radial ambient temperature.
11. Mark the bioscrubber vessel with the fabricator's name, capacity in gallons, maximum temperature, design pressure/vacuum, specific gravity, pH, resin, minimum thickness, vessel number, vessel name, and the date of manufacture. Seal decals, labels, etc. into the laminate exterior with clear resin.
12. Support beds of media with FRP grating sized for maximum deflection of 0.25 inch.
13. Flange and size the air inlet and outlet connections to the vessel as specified on the drawings. Provide FRP blind flanges, with gaskets, constructed to the same standards as the vessels for use on all flanged openings. Provide gasket material suitable for use in a corrosive environment.
14. Provide flanged or female national pipe thread (FNPT) couplings with PVC ball valves for drain, fill, and overflow connections.
15. Ensure that pressure ports use a 1-inch FNPT FRP coupling. Other ports shown in the drawings will be provided by the odor control bioscrubber manufacturer.
16. If supplied, the liquid sump will be an integral part of the vessel located directly below the media bed. Provide overflow and drain connections to the sump.
17. Gusset all flanged connections to the tank wall with 0.25-inch-thick flat plate gussets.
18. Label the tank wall nozzle cutouts in accordance with the submittal drawings. Reinforce all cutouts as required by the conditions specified. Press-molded or compression-molded flanged nozzles are not acceptable.
19. Integrally mold the tie-down and lifting lugs into the walls of the vessel.
20. Install a 1-inch-diameter air sample port on the vessel at the inlet duct, and one 1-inch-diameter air sample port at the outlet duct in the locations shown on the drawings. Close all air sample ports with a 1-inch ball valve. Ensure that the ball valve is chlorinated polyvinyl chloride (CPVC) construction as manufactured by Chemtrol, Hills-McCanna, or an approved substitute.

C. FRP Material:

1. Add ultraviolet absorbers to surfacing resin to improve weather resistance.
2. Use no dyes, pigments, or colorants, except in the exterior gel coat.
3. Curing System:
 - a. Use resin manufacturer's recommended cure system.
 - b. Cure all products to a minimum of 90 percent of the minimum Barcol hardness specified by resin manufacturer.
 - c. Measure Barcol hardness according to ASTM 02583.
 - d. Post-cure the tank and appurtenances in accordance with resin manufacturer's recommendation for time and temperature. Post-curing should be completed with warm-to-hot dry air, free of combustion products. Avoid hot spots.

4. Seal all cut edges, bolt holes, and secondary bonds with a resin coat prior to the final paraffinated resin coat. Fill all voids with a resin paste.
 5. Reinforcement:
 - a. Veil: Chemical surfacing mat, Type C (chemical) glass, 10 mils thick, with a finish and a binder compatible with the lay-up resin.
 - b. Corrosion Liner: resin-rich interior surface using chopped strand mat backing the veil.
 - c. Chopped Strand Mat: Type E glass, minimum 1-1/2 ounces per square foot, with silane finish and styrene soluble binder.
 - d. Continuous Roving Used in Chopper Gun for Spray-Up: Type E glass.
 - e. Woven Roving: Type E glass, nominal 24 ounces per square yard, 4 by 5 weave, with silane type finish.
 - f. Filament Winding Continuous Roving: Type E glass with a silane type finish and a nominal yield of at least 110 strand yards per pound.
 6. Laminate:
 - a. Comply with the mechanical properties and visual acceptance criteria in ASTM C582.
 - b. Consists of a corrosion liner, a structural layer, and a surface layer. All layers continuous.
 - c. Corrosion Liner: consists of an inner surface and interior layer. No additive in the resin.
 - 1) Inner Surface: resin rich liner 0.25 – 0.50 mm thick, constructed using one layer of resin saturated Nexus veil. Minimum 80 percent resin by weight.
 - 2) Interior Layer: resin reinforced with at least two plies of chopped strand mat. Minimum 75 percent resin by weight. Minimum 3 mm thickness.
 - d. Structural Layer: filament wound with continuous roving to provide a glass content of 50 to 80 percent.
 - e. Surface Layer: resin-rich single-ply "C" veil or chopped strand mat.
- D. Mist Eliminator:
1. Install a vertical flow mist eliminator in the stack above the bioscrubber vessel, designed for the operating conditions specified in this section. The mist eliminator must be PPL or 316L stainless steel and configured per the odor control bioscrubber manufacturer's recommendations.
 2. Design mist eliminator to remove 90 percent of droplets greater than 10 microns in diameter and 99 percent of droplets greater than 40 microns in diameter. Do not allow face velocity through the mist eliminator to exceed 900 feet per minute to avoid moisture carry over.
 3. Provide a 1-inch water line with permanent spray nozzle for cleaning of the mist eliminator.
- E. Access Ports:
1. Provide access ports at the following locations for the vessel:
 - a. One port immediately above the maximum water level of the sump, or at the bottom of the vessel if sump not provided

- b. One port at the elevation of the distribution nozzles that enable access to the nozzles for visual inspection and maintenance
 - c. One port on the top of the vessel that enables access to the integral mist eliminator for visual inspection and maintenance
- 2. Provide access ports with minimum diameter as shown on the Drawings with flanged and bolted openings. Ports at the sump, distribution nozzles, and the mist eliminator will have clear acrylic covers with a 2-inch wide FRP backing ring. All other ports will be solid FRP.

F. Ladder and Platform Assemblies:

- 1. Provide FRP ladder/platform assemblies to provide access to the distribution nozzle assembly, the mist eliminator, and all elevated dampers, as indicated on the drawings.
- 2. Structurally attach and support the ladder/platform assemblies to the vessel. Provide structural design calculations, including documentation for all physical properties used in the design, sealed by a professional engineer registered in the State of Washington who is regularly engaged in the design of composite structures.
- 3. Provide the access platforms with safety rails as shown on the Drawings.
- 4. Ensure that the ladder/platform assemblies conform to all applicable code requirements and loads per STRUCTURAL NOTES on the Drawings.

G. Media:

- 1. Ensure that the bioscrubber media is synthetic with no mineral or activated carbon components.
- 2. Prove the media in bioscrubbers via calculations and performance data for a period of at least 1 year, certified by the technical manager and process designer. Submit data per Paragraph 1.04.

H. Irrigation System

- 1. Size the irrigation water system to accommodate intermittent spraying of the bioscrubber media that is sufficient for the required H₂S and odor removal per Paragraph 1.05 or size to replace the sump water at a rate that is sufficient to maintain the desired pH of the water, depending on if the system is designed with recirculation in mind.
- 2. Non-recirculated (makeup) irrigation water will be provided from the plant PRW system. This water is sourced from a creek nearby, with a backup supply from the city (potable) water system.
- 3. Ensure that the irrigation system is capable of completely covering the entire media bed with the recirculated or makeup water.
- 4. Provide a stainless-steel Irrigation Control Panel containing valving and instrumentation for irrigation water, located in an accessible position near grade as shown on the Drawings.
- 5. Provide the following components as part of the Irrigation Control Panel, arranged as depicted on the Drawings:
 - a. Pipe: CPVC, conforming to the requirements listed in the MECHANICAL NOTES on the Drawings.

- b. Pressure reducing valve, check valve, strainer, valves: CPVC, solvent weld connections
 - c. Control valve: Provide a motor operated ball valve to control makeup water flow, conforming to the following requirements:
 - 1) Size as indicated on the Drawings
 - 2) Rated for 125 psig
 - 3) Valve materials:
 - a) Body: PVC per ASTM D1784 Grade A
 - b) Ball: PVC per ASTM D1784 Grade A
 - c) O-rings: EPDM or FKM
 - d) Seats: PTFE
 - e) Shafts: PVC per ASTM D1784 Grade A
 - 4) Valve design:
 - a) Blowout-proof ball and stem
 - b) Socket, solvent-weld or threaded true-union ends
 - c) Full port, non-vented ball, bi-directional shutoff
 - 5) Operator design:
 - a) Electric actuator, provided by valve manufacturer
 - b) ISO 5211 mounting
 - c) 120 VAC, fed from Vendor system Control Panel
 - d) NEMA 4X / 7 enclosure; explosion proof
 - 6) Georg Fischer Type 182 or approved equal
 - d. Flow meter: Magnetic, as described in controls paragraph.
 - e. Flow indicator: Designed to provide local indication and manual adjustment of irrigation water flow, and be an acrylic tube with a 5-inch scale and stainless-steel frame. Ensure that the flow scales indicate the units of flow. The flow indicator must be mid-range capacity and capable of metering up to 30 gallons per minute (gpm) for filling the vessel sump. Provide King Series 7000 or equal.
6. Provide a pH probe/transmitter to continuously measure pH values of odor control bioscrubber sump outlet water, conforming to the following requirements:
- a. Power supply: 120 volts AC, fed from Vendor system Control Panel.
 - b. Signal output: 4 to 20 mA
 - c. Process connection: Insertion

- d. Product requirements:
 - 1) Analyzer: Pipe/surface mount, NEMA 4X with integral keypad/display and self-diagnostics, Hach SC200. The Owner has standardized plant equipment around this manufacturer/model and will not accept substitution requests.
 - 2) Sensor: differential glass electrode, titanium ground electrode, integral preamplifier, 15-foot cable, glass-filled polyetheretherketone (PEEK) body. Selected for union mount. Instrument tube fittings shall be Swagelok 316 SS. Rated for 100 psig, 10 ft/sec flow. Hach 6131300 or Approved Equal.
 - 3) Include SS shut off valve for installation between the plant water system and sensor insertion point.
 - 4) Spare parts: one salt bridge and one bottle of standard cell solution.
 - 5) Calibration buffers: Two sets each of pH 4 and 7 buffers. Use one set for testing/calibration, second set for Owner.
 - 6) Mounting accessories: As required for the installation specified on the drawings, provided by the sensor manufacturer.
- e. Manufacturer services: Two hours per analyzer on-site to assist with calibration and startup. Manufacturer's certified representative acceptable.
- 7. Provide a spray nozzle system designed to distribute irrigation water uniformly over the bioscrubber vessel cross-sectional area. Provide clog-resistant nozzles with a minimum nozzle free passage diameter of ¼-inch, BETE Fog or approved equal.

I. Recirculation Water System:

- 1. The requirements of this paragraph apply to systems that recirculate nutrient-rich water through the bioscrubber. These systems will pump water from the scrubber sump to the irrigation system described in the previous paragraph.
- 2. Recirculation Pump and Motor:
 - a. Ensure that the recirculation pump is the seal-less, centrifugal, magnetic-driven type with non-metallic wetted parts. The pump must be overhung design with close-coupled drivers. The pump will provide the recirculation flow specified in this section at a pressure required by the nozzles and bioscrubber pipe system.
 - b. Ensure that the bearings are a one-piece design press fit into the inner magnet. Provide a front-thrust bearing system that consists of a two-collar design with a replaceable axial-thrust surface. Ensure that the rear-thrust bearing system consists of a one-piece design with replaceable axial-thrust collar. The bearing material must be chemically resistant and suitable for the fluid that is being pumped.
 - c. Provide pump shafts that are silicon carbide or high-purity alumina ceramic. Fully encapsulate the driven magnet, as recommended by the pump manufacturer. Ensure that the outer drive magnet is dynamically balanced and capable of mounting directly to standard National Electrical Manufacturers Association (NEMA) motors. Ensure that the pump frame includes a non-metallic reinforced plastic base and that it does not use the motor for support.

- d. Size the pumps by the odor control bioscrubber manufacturer for the proper flow rate and head conditions as required for the installation. Ensure that the pump is free from cavitation and damaging vibration over the range of operating conditions under which it will perform.
 - e. Recirculation pumps must be Iwaki America Inc., Sundyne, or Finish Thompson Inc.
 - f. Ensure that the noise emission does not exceed 85 decibels (dBA) at a distance of 3 feet from the equipment.
 - g. Recirculation pumps must be driven by a 480 volts alternating current (VAC), 3 phase, 60 hertz, inverter duty, Totally Enclosed Fan-Cooled (TEFC) electrical motor and include a 1.15 service factor. Ensure that the motors conform to the requirements specified in Section 26 05 00.01: Common Work Results for Electrical for Small Projects.
 - h. Design and construct all motors and electrical equipment in complete accordance with the latest edition and revision of all applicable Institute of Electrical and Electronics Engineers (IEEE), NEMA, National Electric Code (NEC), and National Fire Protection Association (NFPA) codes and regulations. Design and construct mechanical components in accordance with the latest edition and revision of all applicable NBS, ASTM, ANSI, and ASME codes and regulations.
 - i. Provide a variable frequency drive in the system control panel to drive the recirculation pump. Conform to the requirements listed in Section 26 05 00.01. The VFD shall provide all necessary pump data to the PCS to meet the monitoring and control requirements of the system control strategy.
3. Piping and Appurtenances:
- a. Ensure that the recirculation system piping and spray header piping is Schedule 80 CPVC.
 - b. Install the pressure gauge and sample port with CPVC ball valves at the recirculation pump discharge and vessel recirculation water inlet.
- J. Nutrient Feed System:
- 1. Biological nutrients stored in the nutrient tank are delivered to the spray nozzle where the solution is circulated through the bioscrubber media. Include all piping and equipment necessary to deliver nutrients from the reservoir to the recirculation lines as part of the nutrient feed system.
 - 2. Ensure that the nutrient feed pump is a positive displacement, peristaltic type utilizing a flexible tube and spring loaded roller or track. The pump shall be suitable for metering service with adjustable speed drives to control the dosage with accuracy of one percent variation from the pump setting. Ensure that the pump output is adjustable while the pump is running. Each pumping unit shall be complete with pump, drive unit, base, and all appurtenances to provide a complete pumping system for biological nutrients typically used in bioscrubber systems. Each pump shall be capable of self-priming when completely dry with a suction lift capability of up to 30 feet of water. The pump shall be capable of running dry without damaging effects to the pump or tubing. All materials used for the metering pumps and accessories shall be designed by the manufacturer to have the necessary strength, stability and stiffness for the intended service. All exposed fasteners must be Type 316L stainless steel.

- a. The manufacturer shall furnish the appropriate hose material for the conditions of use (e.g., extruded Marprene, Neoprene, Silicone, PVC, or Viton). The tubing shall be of 64 shore A durometer.
 - b. Pump tubing diameter may vary for different drive sizes. For drive speeds ranging from 10 to 360 rpm, the pump must accept tubing with a wall thickness of 3/16 inch and an inside diameter ranging from 3/4 inch to 1 inch. For drive speeds ranging from 5 to 265 rpm, the pump must accept a wall thickness of 1/8 inch and a variation in inside diameter ranging from 1/2 inch to 5/8 inch. For drive speeds ranging from 10 to 220 rpm, the pump must accept tubing with an inside diameter of 1/8 inch.
 - c. The rotor assembly shall be equipped with two or four self-lubricating geared compression rollers mounted on spring loaded arms. One roller shall at all times be fully engaged with the tubing providing complete compression to prevent back flow or siphoning. The pumping action shall be created by the occlusion of the pump hose and its subsequent restitution causing a vacuum effect to draw the fluid into the suction side of the hose. Hose occlusion shall be adjustable with a lead screw, which limits the travel of the spring, loaded roller.
 - d. Pumps shall be provided with an integrally mounted adjustable speed drive. The speed setting of the drive shall be continuously adjustable over a minimum 110:1 operating range. The adjustable speed drive shall be for use with brush motors and be located in a NEMA 4X cabinet.
 - e. Local controls shall consist of a speed adjusting potentiometer, a START pushbutton, a STOP pushbutton, and an AUTO/MANUAL switch. Control shall be such that when the drive is running in the MANUAL mode, speed shall be adjusted with the local potentiometer. In the AUTO mode, the drive shall operate in response to an external run command and 4-20 mA external speed reference signal as shown on drawings
 - f. Provide a stainless-steel workbench/pump stand, anchored to the concrete slab shown on the drawings. Mount the nutrient pump to the stand.
 - g. The nutrient feed pumps must be supplied by Watson-Marlow. The Owner has standardized plant equipment around this manufacturer and will not accept substitution requests.
3. Provide a nutrient tank of FRP construction for containment of the biological nutrients. Ensure that the tank is suitable for storage in direct sunlight. Provide pipe connections for the tank drain, outlet, inlet, and vent with the nutrient tank. Ensure that the flanged connections are of the same materials as the tank wall. Threaded connections must be standard NPT. Provide plug, cap, or blind flange on tank drain and inlet connections. Connect outlet connection to nutrient feed pump. Provide screened vent at vent connection. Provide clear section of tank that can be utilized to view nutrient level inside tank.
 4. Size the nutrient tank to provide a minimum of 30 days of nutrient supply—based on projected odor and H₂S loads as specified in this section—before requiring a refill.
 5. Provide nutrients sufficient for the first 6-months of bioscrubber operation.

K. Instrumentation and Control:

1. General:

- a. Contractor shall provide conduit and wiring as specified in Specification Section 26 05 00.01: Common Work Results for Electrical for Small Projects, the Electrical Plan Sheets, and this Section, to the control panel for all power and control circuiting.
 - b. Contractor shall provide all wiring from the system control panel to system components as part of the odor control bioscrubber manufacturer system specified in this section. Ensure that panel construction meets the requirements of Division 26 and this Section.
 - c. All instrumentation, control panels, and electrical equipment within 3 feet of foul air duct, fans, and scrubber vessels must be rated for Class I, Division 2, Group D. Conduit and wiring methods must meet NEC requirements for Class 1, Division 2 within 3 feet of the foul air stream. Provide intrinsically safe circuit extensions from control panels in unclassified locations into hazardous classified locations in accordance with the NEC as required by UL 698A.
2. Control Panel:
- a. NEMA 4X, 316L stainless steel, free-standing enclosure UL listed for 480 volt (V), 3 phase, 60 ampere (A), 35kAIC minimum interrupt rating. Provide a door mounted, lockable, cabinet disconnecting means and internal power distribution equipment. Power feed for the control panel shall be provided from an onsite MCC, see Electrical Plan sheets for details. Any voltages other than 480V, required either internally for the control panel's equipment or externally for equipment or instrumentation fed by the control panel (120V AC, 24V DC, etc.) shall be derived internal to the control panel. Ensure that the power supply and controls are coordinated and provided by the Contractor based on the supplied equipment.
 - b. Mount the control panels independent of the odor control system at least 3 feet away from any odor leakage source.
 - c. Ensure that the controls are as shown on the P&IDs, wiring diagrams, and as described in the Control Strategy in Paragraph 2.02K.6 below.
 - d. Provide the control panel with all required associated hardware to serve as a remote I/O panel for interface with the existing PCS. Communication between the remote I/O panel and PCS shall be Ethernet/IP. Contractor shall coordinate PCS interface and odor control bioscrubber system programming requirements with the Owner.
 - e. Provide the control panel and all required associated hardware for this panel, as specified in Division 26, to provide operation as described in the contract documentation.
3. Remote I/O
- a. Provide a complete remote I/O system for communication to the existing PCS via Ethernet/IP. The remote I/O system shall accommodate all equipment and instrumentation I/O points associated with the bioscrubber system.
 - b. The bioscrubber system control panel shall provide all necessary data to the PCS to meet the monitoring and control requirements of the system control strategy.
 - c. Manufacturer:
 - 1) Rockwell/Allen Bradley ControlLogix. The Owner has standardized around this equipment and will not accept any substitutes.

- d. Power Supply:
 - 1) 120 VAC input
- e. Networking Connections:
 - 1) Remote I/O Chassis shall have ability for single or redundant network connections in a single PLC card. Single connection requirements shall be Allen Bradley 1756-EN2T. Redundant connection requirements for ring configurations shall be Allen Bradley 1756-EN2TR.
- f. Input/Output Modules:
 - 1) Analog Input (4-20 mA_{dc}/1-5 V_{dc}, isolated channel-to-channel, 8 channels, HART): 1756-IF8H
 - 2) Analog Output (8 channel): 1756-OF8
 - 3) Digital Input (120V): 1756-IA16
 - 4) Digital Output (120V isolated): 1756-OW16I
 - 5) Spare Input/Outputs: The greater of a minimum 1 channel or 20 percent of each type.
- g. Miscellaneous: Provide all cables, taps, terminators, power supplies, and accessories for a complete operating remote I/O system to be compatible with the onsite PCS.
- 4. Communication
 - a. The Bioscrubber system control panel shall communicate to the onsite PCS via Ethernet/IP communication. The remote I/O device, Recirculation Pump VFD, and Foul Air Fan VFD, residing in the Bioscrubber system control panel, shall be integrated into the existing plant Ethernet device level ring, as shown on the Electrical drawings.
- 5. Irrigation Water Controls:
 - a. Provide a flow transmitter installed in the irrigation piping to monitor flow. A software interlock in the PCS shall alarm and shut the recirculation pump off (if running) at low-flow conditions.
 - b. Ensure that the flow transmitter is an Endress and Hauser 400 Series magnetic flow meter/transmitter with internal calibration check feature, local flow indication, and Ethernet/IP communication to the Vendor control panel. The Owner has standardized around this equipment and will not accept any substitutes. Ensure installation meets manufacturer recommended straight run of five pipe diameters upstream and two pipe diameters downstream.
 - c. Control of the recirculation pump shall be provided by Ethernet/IP communication to the existing PCS. Contractor to coordinate PCS interface with the Owner.
- 6. Control Strategy:
 - a. General:
 - 1) The bioscrubber is designed to continuously treat foul air from the headspace of the solids holding tank.
 - 2) The odor fan runs continuously, feeding foul air into the bottom of the bioscrubber. The foul air is treated through reactions with organisms in the media. Mist in the foul is removed by the mist eliminator, and treated air is discharged through the stack.

- 3) If necessary, two-stage treatment is achieved by opening a damper from the bioscrubber stack to the existing foul air system.
 - 4) The irrigation system sprays water on the media to maintain required humidity in the media to promote biological growth.
- b. Control Description:
- 1) The odor fan is driven by an electric motor. Motor speed, and therefore air flowrate, is adjusted via a Variable Frequency Drive (VFD). The VFD speed setpoint is operator-adjustable.
 - 2) The existing PCS shall be programmed by the Owner's programmer to execute the process logic described in this section and as specified in other related contract documents. All bioscrubber system control logic shall reside in the PCS. Contractor to coordinate scheduling of programming with the Owner.
 - 3) Irrigation water to the bioscrubber can be supplied via opening a motor operated ball valve to supply plant water or by activating the recirculation water pump.
- c. Normal Operation - Fan:
- 1) The fan has a LOCAL-OFF-REMOTE (LOR) selector switch at the system control panel. The fan operates as follows:
 - a) When in LOCAL, the operator can start and stop the fan and adjust speed via the buttons and speed pot on the system control panel.
 - 2) Fan speed is represented at the VFD as follows:
 - a) 0% is the fan's VFD speed when at 0 hertz.
 - b) Initial minimum and maximum speeds will be determined by the manufacturer to achieve the flow rates specified for the fan.
 - c) 100% is the fan's VFD maximum speed.
 - 3) Placing the LOR switch into the OFF position stops the fan.
 - 4) Placing the LOR switch into the REMOTE position enables control from the PCS. When in REMOTE, the fan starts and stops and has its speed adjusted via the PCS, based on parameters programmed in the PCS control sequence or manually as directed by the operator.
- d. Normal Operation – Recirculation Pump:
- 1) The recirculation pump has a LOCAL-OFF-REMOTE (LOR) selector switch at the system control panel. The pump operates as follows:
 - a) When in LOCAL, the operator can start and stop the pump and adjust speed via the buttons and speed pot on the system control panel.
 - 2) Pump speed is represented at the VFD as follows:
 - a) 0% is the pump's VFD speed when at 0 hertz.
 - b) Initial minimum and maximum speeds will be determined by the manufacturer to achieve the flow rates specified for the pump.
 - c) 100% is the pump's VFD maximum speed.
 - 3) Placing the LOR switch into the OFF position stops the pump.
 - 4) Placing the LOR switch into the REMOTE position enables control from the PCS. When in REMOTE, the pump starts and stops and has its speed

adjusted via the PCS, based on parameters programmed in the PCS control sequence or manually as directed by the operator.

e. Normal Operation – Irrigation Control Valve:

- 1) The control valve has a LOCAL-OFF-REMOTE (LOR) selector switch at the system control panel. The valve operates as follows:
 - a) When in LOCAL, the operator can open and close the valve via the buttons on the system control panel.
- 2) Placing the LOR switch into the OFF position stops the valve.
- 3) Placing the LOR switch into the REMOTE position enables control from the PCS. When in REMOTE, the valve opens and closes via the PCS, based on parameters programmed in the PCS control sequence or manually as directed by the operator.

f. Alternative Operation:

- 1) Power Failure Restart: On return of electrical power, the bioscrubber system shall follow the existing plant restart strategy.

g. Status Monitoring:

- 1) The remote I/O device and/or VFDs will be capable of passing, by Ethernet/IP, the following I/O points from the Bioscrubber Odor Control Equipment to the onsite PCS for status:
 - a) Fan running status.
 - b) Fan speed.
 - c) Fan fault.
 - d) Recirculation pump running.
 - e) Recirculation pump fault.
 - f) Sump pH value.

h. Alarms:

- 1) All alarms shall be integrated into the PCS.
- 2) All MAJOR alarms cause related equipment to shut down and prevent restart until the alarm condition has been cleared.
- 3) Alarms related to the bioscrubber system:

Asset Tag	Asset Name	Alarm Type	Criticality	Note
TSH-13311A	Bioscrubber Fan Motor	High Temperature	Major	
LSHH-13311	Bioscrubber Sump	High Level	Major	
AIT-13311F	Bioscrubber Drain	High pH	Minor	Normal pH range set by manufacturer at startup
FIT-13311E	Irrigation Water	Low Flow	Minor	
FIT-13311E	Irrigation Water	No Flow	Major	

L. Accessories:

1. Pressure differential indicators: Provide the bioscrubber vessel with pressure differential indicators for measuring the pressure drop across each media bed and the integral mist eliminator. The pressure differential indicator gauges must

be operator accessible from the ground level or by using provided ladders and platforms. Configure the differential pressure indicator assembly to prevent the migration of water from the tubing into the gauge and equip with a valve/petcock to drain condensate from the tubing. Provide Ashcroft 1134 gauges or equal, capable of indicating up to 2 inches water column difference between high and low sides.

2. Temperature indicators: Provide temperature indicators for measuring the foul air temperature at the inlet and outlet to the bioscrubber. The temperature indicator gauges must be operator accessible from the ground level or by using provided ladders and platforms. Provide temperature indicators with 4-1/2-inch gas pressure operated bourdon tube elements, 270-degree movement, phenolic case, shatterproof glass window, 1/2-inch NPT process connection, with indicator head capable of being swivel mounted to the stem. Provide bulb, sized 3 inches long by 3/8-inch diameter for all ranges. Select stem length to place bulb in middle third of pipe. Provide Ashcroft Duratemp Type 600B gauges or equal, sized for the full range of temperatures, 20-240°F. Provide a Type 316L stainless steel thermowell, complying with ASME B40.200, to allow removal of the temperature indicators without interrupting the process service.
3. Equipment identification plates: Ensure that the equipment identification plates consist of a 16-gauge, type 316L stainless-steel plate or FRP laminate, that they are securely mounted on the equipment in a readily visible location. The plate must bear the 0.25-inch die-stamped equipment number specified in Paragraph 1.01 Equipment List.
4. Lifting lugs: Provide equipment more than 100 pounds with lifting lugs.
5. Anchor bolts and tie down lugs: Provide all anchor bolts. Ensure that the anchor bolts and tie down lugs are type 316L stainless steel. The final size must be coordinated with the final shop drawings.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Equipment Mounting:
 1. Install bioscrubber vessel in accordance with the structural requirements equipment mounting details shown on the drawings.
 2. Install recirculation pump on an equipment pad as shown on the Drawings and in accordance with manufacturer's recommendations.
 3. Install makeup water system, nutrient feed system, and control panel in accordance with manufacturer's recommendations and as shown on the Drawings.
- B. Install the bioscrubber media in strict accordance with the manufacturer's recommendations. Ensure that the media contain no void pockets, including bed areas near the vessel walls. Ensure that the media have a uniform depth throughout.
- C. Coatings: Repair and touch up of factory finish.

3.02 START UP, TESTING AND COMMISSIONING

- A. Carry out start up and testing in accordance with Section 01 91 14.
- B. Ensure that the system start up is performed by the odor control bioscrubber manufacturer and that it commences following a visual inspection of the system by the odor control bioscrubber manufacturer's technical representative. The odor control bioscrubber manufacturer will test the equipment operation in both manual and automatic in coordination with the Owner's programmer to meet the requirements of the Contract Documents.
- C. Carry out the commissioning period under the supervision of the odor control bioscrubber manufacturer's representative. Provide the Owner with access to the facility during commissioning at all times.
- D. Commissioning of the bioscrubber odor control system is projected to extend for 28 days to allow for successful acclimation of the biological system, and to provide sufficient treatment of odors as specified herein. The Contractor is responsible for operations of the bioscrubber odor control system and associated components until the Owner accepts all performance testing.

3.03 ODOR CONTROL SYSTEM TESTING

- A. Factory Acceptance Testing:
 - 1. Control system equipment shall be subject to a Factory Acceptance Test to verify that the equipment is manufactured and assembled correctly, is operating as designed, and is in compliance with the contractual requirements. Any remote I/O panels shall be wired to a PLC to allow full testing. The FAT shall be performed at the factory with the option for witness by the Owner or Owner's representatives.
 - 2. The FAT shall include the following:
 - a. Visual inspection of equipment, instruments, and control panels.
 - b. Exercise all inputs and outputs, both individually and collectively, by simulated signals for analog inputs and by shorting discrete inputs.
 - c. Demonstrate analog input and analog output accuracy.
 - d. Demonstrate the correct operation of all digital communication devices.
 - e. Deficiencies shall be corrected prior to shipment.
 - f. Provide certified test results for the deliverable equipment.
 - g. Test shall be fully documented and signed by the Contractor's factory supervisor.
- B. Functional Testing:
 - 1. Alignment test: An alignment test checks complete assemblies for correct rotation, proper alignment and connection, and quiet operation.
 - 2. Air balancing test: Provide for services of an independent air balancing and testing firm to measure and report the foul air into odor control system as specified in the contract documents. Ensure that certification of functional acceptance prior to commencing performance testing is provided by the Contractor.

3. Odor control system tests: Test all system components for proper adjustment and operation in both the manual and automatic operating modes. The Contractor and the odor control bioscrubber manufacturer's programmer will coordinate the testing of the equipment operation in both manual and automatic with the Owner's programmer. The odor control bioscrubber manufacturer's technical representative system tests will include the bioscrubber odor control system operation through the monitoring and alarming at the PCS in coordination with the Owner's programmer.

C. Performance Testing General Conditions:

1. After completion of the functional testing, subject the bioscrubber odor control system to a performance test to verify the removal of odor from the foul air. Include all sampling and laboratory analysis in the Contractor system cost.
2. Conduct performance testing to demonstrate that the system furnished hereunder is installed and performs in accordance with the provisions of these specifications. Conduct the performance testing after a minimum acclimation period of 28 days following startup of the system.
3. Ensure that the performance test does not commence until a Performance Testing Plan has been submitted and approved, and the functional testing has been completed. The Performance Test Plan will contain written procedures and guarantee points to be used.
4. Perform the testing for a minimum of 12 hours on actual odors from the sources to be controlled. The odor control bioscrubber manufacturer will coordinate with the Owner to test during a period where both the daily average and peak odors specified in this section are expected to occur.
5. The odor control bioscrubber manufacturer will provide, install, and maintain (if required) all temporary metering and analytical equipment that is necessary to measure the various performance parameters.
6. The odor control bioscrubber manufacturer will inform the Owner at least 10 working days prior to the start of any performance testing. The Owner will have the right to observe, sample, and make any parallel determinations during the performance test.
7. Within 20 working days after the conclusion of the test period, the odor control bioscrubber manufacturer will submit a Performance Test Report, including all laboratory and field test data, stating the conclusions of the test with regard to the performance criteria.

D. Sampling and Data Measurement:

1. During the test period, as a minimum, take data and measurements at the frequency specified in the Performance Testing Plan, which will be (at most) a 30-minute interval for the following:
 - a. Bioscrubber inlet and outlet air flow rate, measured in units of cubic foot/feet per minute (cfm). Perform the measurement of air flow rates using an anemometer or pitot tube instrument previously approved by Owner.
 - b. Bioscrubber inlet and outlet temperature, measured in degrees Fahrenheit. Perform using supplied temperature gauges.
 - c. Bioscrubber H₂S inlet and outlet concentrations, measured in units of part(s) per million by volume (ppm). Field measurements will be collected by the

odor control bioscrubber manufacturer using a field H₂S measurement unit. The outlet concentration will use a hand-held unit with the analytical capability of measuring field H₂S concentrations as low as 1 part per billion by volume (ppb). Ensure that the hand-held unit is the Jerome 631-X Analyzer, Jerome 605 Analyzer, or equal.

- d. Continuous bioscrubber H₂S inlet and outlet concentrations, measured in units of ppm. Continuous field measurements will be collected by the odor control bioscrubber manufacturer using an OdaLog or Acrulog data logger with an appropriate measurement range given the projected inlet H₂S concentrations to the odor control system. One data logger will continuously measure H₂S concentrations at the inlet of the bioscrubber and one data logger will continuously measure H₂S concentrations at the outlet of the bioscrubber. The odor control bioscrubber manufacturer will use the sample ports as shown on the drawings. Commence data logging data collection after the biological system has reached acclimation and ensure that collection lasts for at least 48 continuous hours.
 - e. Measure the fan discharge pressure in units of inches (in.) water column (w.c.), Measure the fan discharge pressure using a hand-held digital manometer. The hand-held unit must be Dwyer, or equal. Record the pressure every 2 hours for one 8-hour period.
 - f. Media bed pressure drop, measured in units of in. w.c. Read the pressure differential off of the installed pressure differential gauge installed on the bioscrubber vessel per this specification. Pressure differential measurements will demonstrate that differential pressure (pressure drop) across the media bed does not exceed the specified pressure limits. Record the pressure every 2 hours for one 8-hour period.
2. Sampling log: Maintain a sampling log that includes the date, time, location, sampler, and results of each sample, weather conditions for the sampling day, a qualitative description of the operation of the wastewater and wastewater treatment processes, and a description of exceptions from the sampling plan.

E. H₂S Removal Performance Testing:

1. Conduct performance testing only after the equipment has achieved stable performance following commissioning period. The performance testing must include system inlet and outlet H₂S monitoring to demonstrate the odor-removal efficiency of the equipment. Removal efficiency for H₂S for this performance testing is defined as:

$$\text{percent removal} = \frac{(\text{inlet H}_2\text{S concentration} - \text{outlet H}_2\text{S concentration})}{\text{inlet concentration}} \times 100$$

2. The performance test will be deemed successful if the average percent removal through the bioscrubber as measured by the data loggers consistently meets performance requirements in Paragraph 1.05 when measured during the 48-hour testing period.

F. Performance Testing Report:

1. The Contractor is responsible for submitting written documentation of the bioscrubber system's successful performance in meeting requirements set forth in this section. The performance must meet requirements for H₂S removal and

media bed pressure drop and the system must be operating within established ranges listed in this section.

2. Summarize the testing results in a report. If the testing results do not meet the removal requirements of this specification, perform a retest as stated in Paragraph 3.03 Retesting. The additional performance tests will be at no cost to the Owner until the removal requirements are met. Submittal of the report is the responsibility of the Contractor.
3. Maintain a sampling log that includes the date, time, location, sampler, and results of each sample, weather conditions for the sampling day, a qualitative description of the operation of the wastewater and wastewater treatment processes, and a description of exceptions from the sampling plan.
4. Within 10 working days of submission of the Performance Test Report documenting compliance with specified performance requirements, the Owner will give written notice of the final acceptance of the system to the odor control bioscrubber manufacturer.

G. Retesting:

1. In the event the system fails to meet the performance requirements, the Vendor will immediately make the necessary modifications, adjustments, or facility expansions to meet them. The steps taken by the Vendor will include (as necessary): (1) design and construction of additional system capacity, (2) upgrades to the air distribution system, and (3) replacements of the media at no additional cost to the Owner. Additional performance tests will be conducted by the Vendor until the performance requirements are met, at no additional cost to the Owner.
2. If after two retests the performance requirements are still not met, the Owner will have the option (at the Owner's sole discretion) to accept the system as it is or to obtain a replacement at the expense of the Vendor. The maximum time between each retest will be 20 working days.

3.04 MANUFACTURER'S REPRESENTATIVE

- A. Ensure that an odor control bioscrubber manufacturer's certified representative for the equipment specified herein is present at the job site or classroom designated by the Owner for the minimum person-days listed for the services list herein (travel time excluded). The services will be at such times as requested by the Owner:
 1. One person-days during construction for installation assistance, inspection, and certification of the installation
 2. Provide start up, testing and commissioning under the supervision of the manufacturer's representative. Provide a manufacturer's start up technician for a minimum of three trips consisting of a minimum of 3 total days on site.
 3. One person-day for classroom or site training.
 4. See Sections 26 05 00.01 and 43 11 19.13 for additional training for associated unit responsibility equipment.
- B. Training will be as specified in Section 01 43 33 and certified on the Manufacturers Instruction Certification Form, appended at the end of this section.

END OF SECTION 44 31 21

44 31 21-A MANUFACTURER'S INSTRUCTION CERTIFICATION FORM

Contract No:	Specification Sections: 44 31 21, 43 11 19.13 and 26 05 00.01
Equipment name:	
Contractor:	
Manufacturer of equipment item:	
The undersigned manufacturer certifies that a service engineer has instructed the wastewater treatment plant operating personnel in the proper maintenance and operation of the equipment designated herein.	

Operations Check List (check appropriate spaces)

Startup procedure reviewed	
Shutdown procedure reviewed	
Normal operation procedure reviewed	
Others:	

Maintenance Check List (check appropriate spaces)

Described normal oil changes (frequency)	
Described special tools required	
Described normal items to be reviewed for wear	
Described preventive maintenance instructions	
Described greasing frequency	
Others:	

Manufacturer Representative

Contractor Representative

Signature

Signature

Date

Date

Owner's Representative

Signature

Date

44 32 21-B UNIT RESPONSIBILITY CERTIFICATION FORM

NETP ODOR CONTROL BIOSCRUBBER
CERTIFICATE OF UNIT RESPONSIBILITY
FOR SPECIFICATION SECTION 44 31 21
BIOSCRUBBER ODOR CONTROL EQUIPMENT

In accordance with Section 44 31 21-1.02.H Unit Responsibility of the contract documents, the undersigned manufacturer of driven equipment ("manufacturer") accepts unit responsibility for all components of equipment furnished to the Project under specification Section 44 31 21, and for related equipment manufactured under sections 43 11 19.13, 26 05 00.01 and 23 31 16.16.

We have reviewed the requirements for section 44 31 21 and all sections referencing this section, including but not limited to drivers, supports for driving and driven equipment and all other specified appurtenances to be furnished to the Project by manufacturer. And, we have further reviewed, and modified as necessary, the requirements for associated variable speed drives and motor control centers. We hereby certify that all specified components are compatible and comprise a functional unit suitable for the specified performance and design requirements whether or not the equipment was furnished by us. We will make no claim nor establish any condition that problems in operation for the product provided under this specification Section 44 31 21 are due to incompatibility of any components covered by this Certificate of Unit Responsibility. Nor will we condition or void any warranty for the performance of the product of this specification Section 44 31 21 due to incompatibility of any components covered under this Certificate of Unit Responsibility.

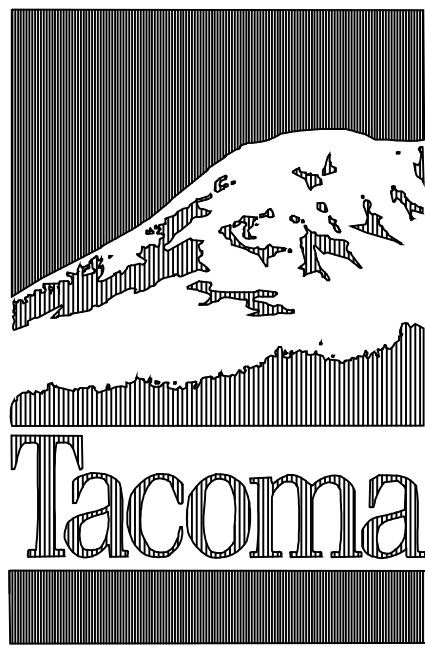
Our signature on this Certificate of Unit Responsibility does not obligate us to take responsibility for, nor to warrant the workmanship, quality, or performance of related equipment provided by others under specification sections 43 11 19.13, 26 05 00.01, and 23 31 16.16. Our obligation to warranty all equipment provided by us shall remain unaffected.

Notary Public		Name of Corporation
Commission expiration date		Address
Seal:		By:
		Duly Authorized Official
		Legal Title of Official
		Date

END OF TECHNICAL SPECIFICATIONS

APPENDIX A

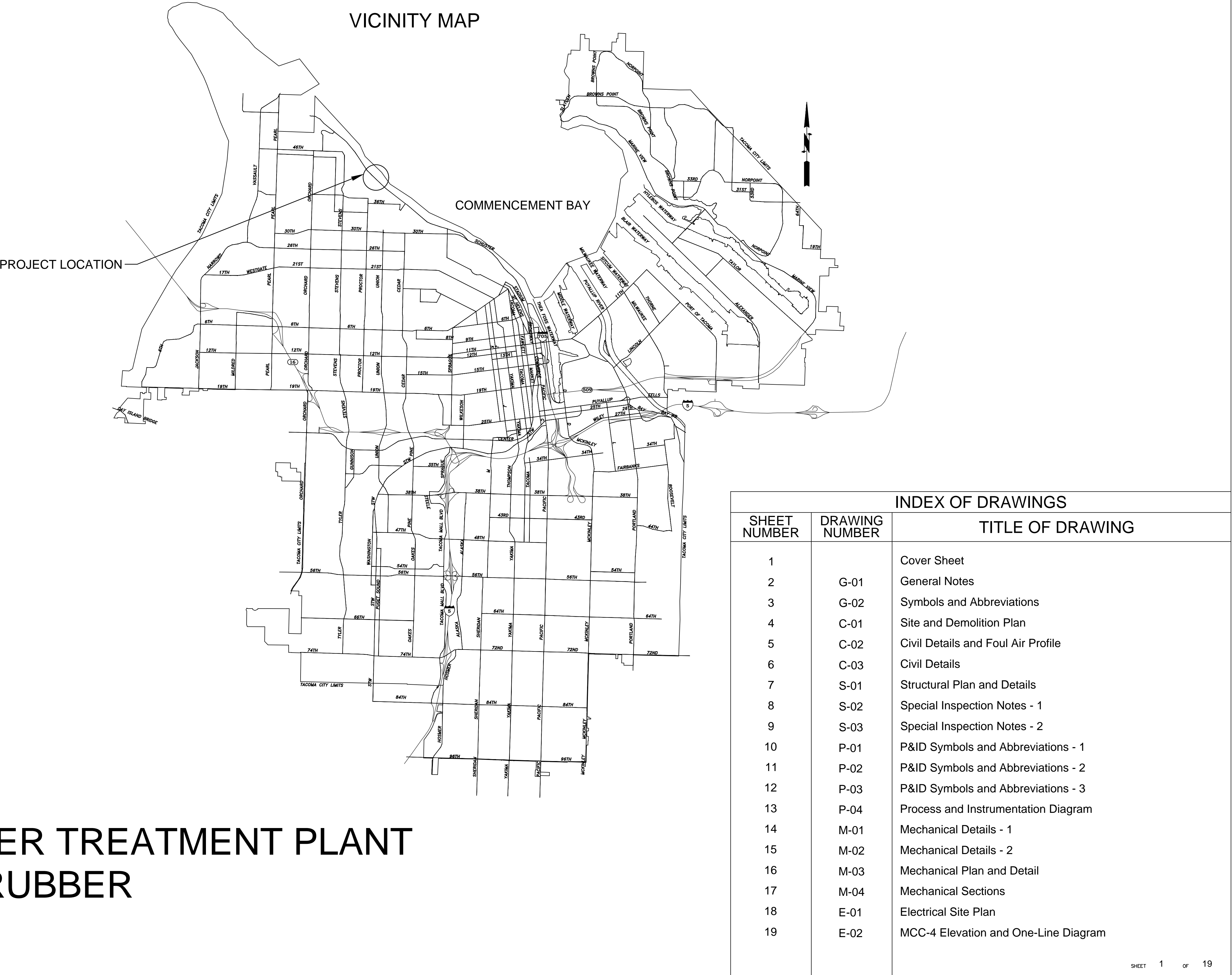
PLANS



ENVIRONMENTAL SERVICES DEPARTMENT
SPECIFICATION NO. ES22-0060F
PROJECT NO. ENV-04016-07

MAY 2022

BID DOCUMENTS



NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER

GENERAL NOTES:

- G1 ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL LAWS AND THE CONTRACT DOCUMENTS.
- G2 CONTRACTOR SHALL VERIFY LOCATION OF ANY/ALL EXISTING UTILITIES IN THE VICINITY OF WORK. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROMPTLY NOTIFY THE OWNER OF ANY CONFLICT WITH EXISTING UTILITIES.
- G3 CONTRACTOR SHALL NOTIFY THE OWNER A MINIMUM OF 72 HOURS (3 WORKING DAYS) IN ADVANCE OF ALL REQUESTS FOR TESTING OR INSPECTIONS.
- G4 CONTRACTOR SHALL FURNISH SHOP DRAWINGS FOR APPROVAL WHERE REQUIRED BY THE DETAILED SPECIFICATIONS OR DRAWINGS.
- G5 CONTRACTOR SHALL INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND CITY OF TACOMA REQUIREMENTS.
- G6 THE CONTRACTOR SHALL HAVE A SET OF THESE APPROVED PLANS AND APPLICABLE DETAILS ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS. NO CHANGES ARE TO BE MADE WITHOUT PRIOR WRITTEN APPROVAL BY THE ENGINEER.
- G7 RESTORE ALL PRIVATE AND PUBLIC PROPERTY AFFECTED BY THIS WORK TO A CONDITION EQUAL TO OR BETTER THAN EXISTED BEFORE COMMENCING CONSTRUCTION WORK UNLESS SPECIFICALLY EXEMPTED BY THE DRAWINGS. RESTORATION WORK INCLUDES, BUT IS NOT LIMITED TO, PAVEMENT, BASE, COURSE, SUBGRADE, CONCRETE CURBS, SIDEWALKS, SIGNAGE, ETC. ALL RESTORATION WORK SHALL BE PER SPECIFICATIONS.
- G8 CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL PLANS AND ALL DELINEATORS, FLAGMEN, ETC. CONSTRUCTION STAGING SHALL BE COORDINATED WITH THE CITY PRIOR TO ANY WORK OR MATERIALS BEING BROUGHT ONSITE. THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT CONDITIONS
- G9 CONTRACTOR TO ADHERE TO COVID-19 EXPOSURE PROTOCOLS RELATED TO T'HE LATEST CDC AND WASHINGTON STATE GUIDANCE, WHICHEVER IS MORE STRINGENT. CONTRACTOR TO SUBMIT A PROJECT SAFETY PLAN FOR APPROVAL PRIOR TO MOBILIZATION.

CONSTRUCTION SEQUENCE AND CONSTRAINTS:

- CS1 FIELD VERIFY ALL NECESSARY DIMENSIONS PRIOR TO PROCEEDING WITH THE WORK.
- CS2 SUBMIT SHOP DRAWINGS FOR MATERIALS AND EQUIPMENT PRIOR TO FABRICATION AND INCORPORATION IN THE WORK.
- CS3 COVER SOLIDS HOLDING TANK LID TO PREVENT FOUL AIR LEAKAGE AT THE END OF EACH WORKING DAY.
- CS4 FOR TIE-IN OF 10-INCH FOUL AIR TO EXISTING 15-INCH FOUL AIR LINE, EXISTING AIR FLOW FROM UPSTREAM CONNECTIONS MAY BE CURTAILED FOR UP TO 6 HOURS. NOTIFY PLANT OPERATORS 72 HOURS IN ADVANCE OF WORK TO SCHEDULE ADJUSTMENT OF CONNECTED AIR FLOWS.
- CS5 FOR TIE-IN TO PLANT WATER SYSTEM, COORDINATE WITH PLANT OPERATORS 72 HOURS IN ADVANCE OF WORK. OUTAGE DURATION MAY BE UP TO 6 HOURS.

CIVIL NOTES:

- C1 PROTECT EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.
- C2 SAWCUT ALL PAVEMENT AND CONCRETE AT CUTS. MATCH EXISTING GRADE WHERE CONNECTING NEW PAVEMENT TO EXISTING PAVEMENT.
- C3 NEW PAVEMENT WORK PER DETAIL C, SHEET C-03.
- C4 GENERAL PIPE INSTALLATION REQUIREMENTS PER WSDOT STANDARD SPECIFICATIONS 7-08.

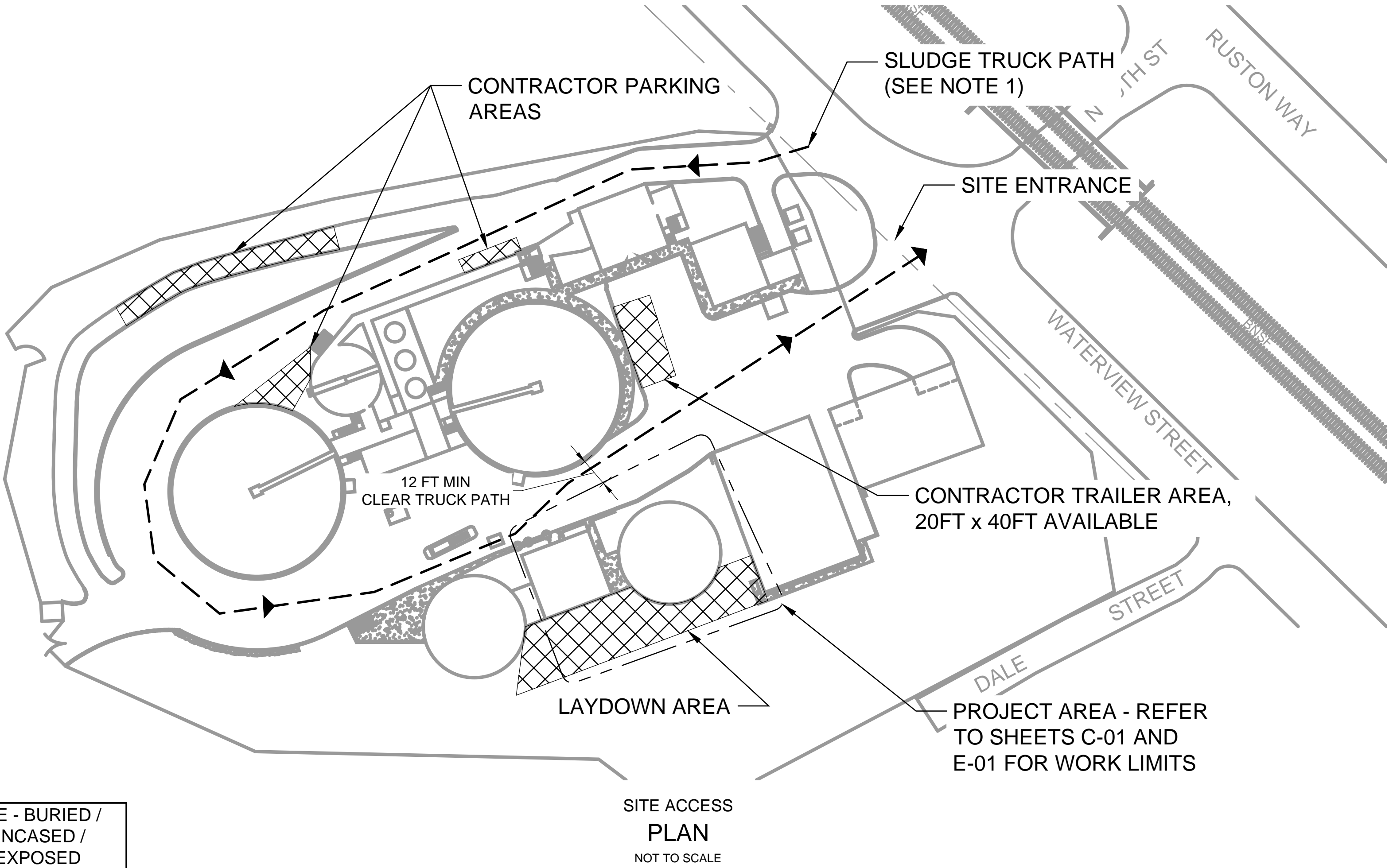
PROJECT DATUM:

VERTICAL DATUM:
NATIONAL GEODETIC VERTICAL DATUM 1929 (CITY OF TACOMA DATUM)

MECHANICAL NOTES:

PIPING

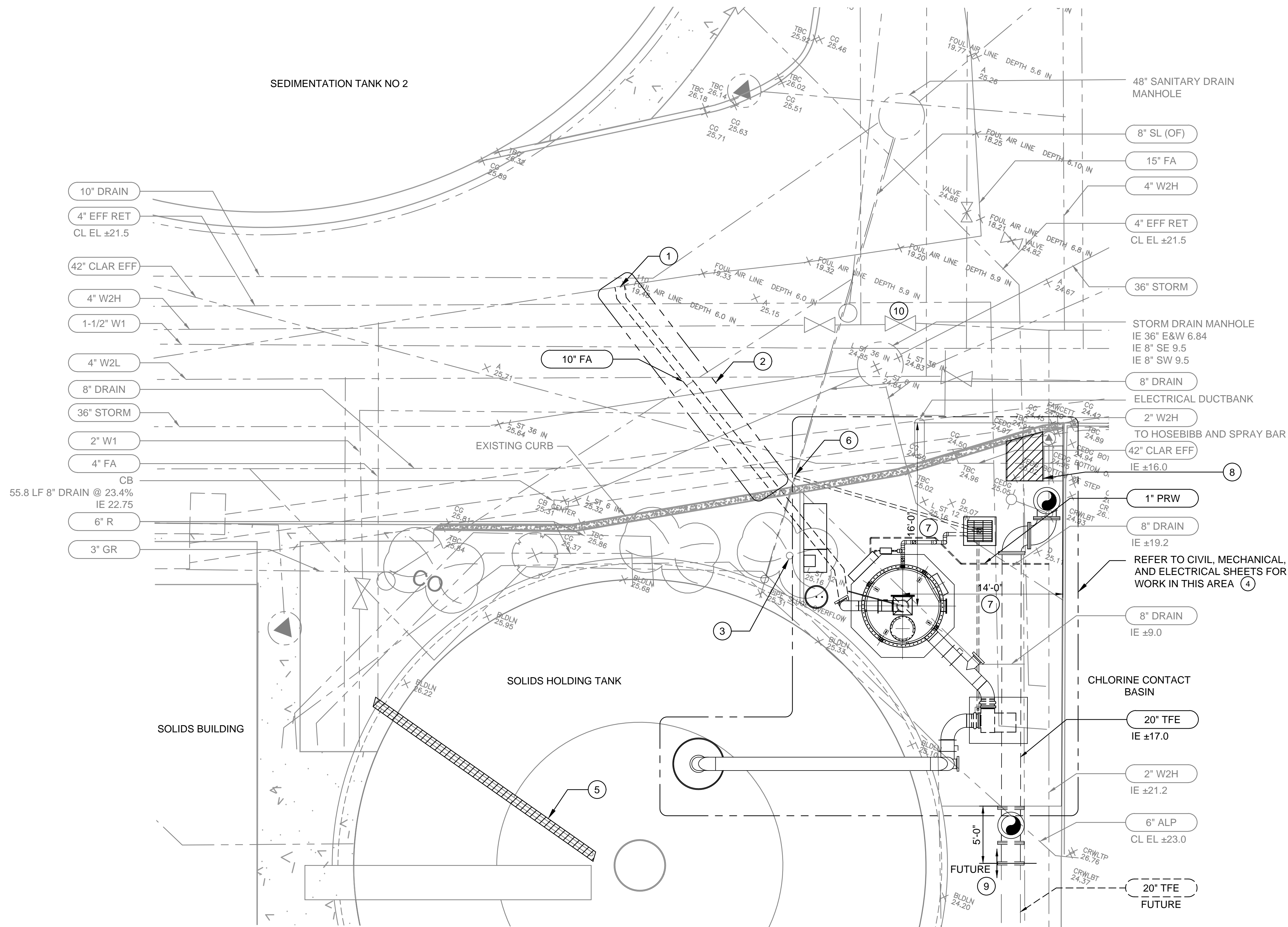
- MP1 FOUL AIR (FA) DUCTWORK IS SPECIFIED IN SECTION 23 31 16.16. THE FOLLOWING REQUIREMENTS PERTAIN ONLY TO THE FOLLOWING PIPING SERVICES IDENTIFIED ON THE DRAWINGS:
PD PROCESS DRAINAGE
PRW PROTECTED WATER
TFE TRICKLING FILTER EFFLUENT
NUT RECIRCULATION WATER
W2H NO 2 (PLANT) WATER, HIGH PRESSURE
- MP2 PROVIDE NEW PIPE AND FITTINGS, FREE FROM DEFECTS, AND CONFORMING TO THE REQUIREMENTS IN THE TABLE BELOW.
- MP3 SUBMIT PRODUCT DATA TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION OF PIPING COMPONENTS.
- MP4 FLANGE BOLTS / NUTS: PROVIDE ASTM A307-B HEAVY HEX BOLTS WITH ASTM A563-A HEAVY HEX NUTS, EACH COATED WITH TRIPAC 2000 BLUE OR EQUAL. BOLT LENGTH PER ASME B16.5 PLUS THREE ADDITIONAL THREADS. CLASS 2A / 2B STANDARD COARSE SERIES THREADS PER ASME B1.1.
- MP5 INSULATE ALL ABOVEGRADE PIPING WITH 1" THICK CELLULAR ELASTOMERIC INSULATION PER ASTM C534, TYPE 1, GRADE 1. PROVIDE PVC JACKETS AND COVERS.



NOTES:

1. MAINTAIN 12-FOOT WIDE SLUDGE TRUCK TRAVEL PATH AT ALL TIMES. SHORT TERM OBSTRUCTIONS OF THE TRUCK PATH, LASTING UP TO 1-HOUR, MAY BE COORDINATED WITH PLANT STAFF. PROVIDE MINIMUM 48 HOUR NOTICE IN ADVANCE OF TRAVEL RESTRICTIONS.

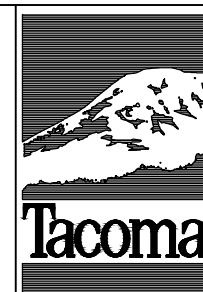
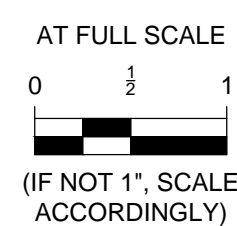
	NUT, PD - EXPOSED	NUT, PD - BURIED / ENCASED	PRW (W2H) - BURIED / ENCASED / EXPOSED	TFE - BURIED / ENCASED / EXPOSED
MATERIALS	SCHEDULE 80 CPVC PER ASTM D1784 CLASS 23447-B, DIMS PER ASTM F441		SCHEDULE 40 STEEL PER ASTM A53, GRADE B, TYPE E OR S, GALVANIZED, DIMS PER ASME B36.10	DUCTILE IRON PER AWWA C151, CLASS 250
CONNECTIONS	SOLVENT WELD OR FLANGED	SOLVENT WELD	THREADED	RESTRAINED MJ, RESTRAINED PUSH-ON, OR FLANGED
INTERNAL LINING	NONE			CERAMIC EPOXY, MFGR STD
EXTERNAL COATING	NONE		PE OR PVC ADHESIVE CORROSION PROTECTION TAPE	ASPHALTIC PER AWWA C151
FITTINGS	ASTM D-1784 - CLASS 23447-B, DIMENSIONS PER ASTM F439		CLASS 3000 STEEL PER ASTM A105, DIMS PER ASME B16.11	DUCTILE IRON PER ASTM A536-GR 65/45/12, DIMS PER AWWA C110 OR C153
FLANGES	ASTM A-1784 CLASS 23447-B, FULL FACE, DIMENSIONS PER ASME B16.5		N/A	AWWA C115 OR C110
GASKETS	NITRILE OR NEOPRENE, 1/16" THICK			
TESTING	PRESSURE TEST PIPE TO 100 PSIG FOR A MINIMUM OF 2 HOURS. ZERO LEAKAGE ALLOWED.			
CLEANING	FLUSH PIPING WITH CLEAN WATER TO REMOVE ALL CONSTRUCTION DEBRIS.			
NOTES	PERFORM SOLVENT WELDING WITH WELD-ON 724 OR EQUAL. UNIVERSAL PLASTIC PIPE SOLVENT IS NOT ACCEPTABLE. PRIOR TO SOLVENT WELDING, CLEAN ALL JOINTS AND PRIME WITH STAINING PRIMER.		TRANSITION POINT FROM BURIED TO EXPOSED MATERIAL 1' ABOVE GRADE.	



1. SHEET BACKGROUND ARE BASED ON RECORD INFORMATION AND A LIMITED SURVEY PROVIDED BY THE CITY OF TACOMA. FIELD VERIFY LOCATIONS AND SIZES OF EXISTING STRUCTURES, EQUIPMENT, PIPES, FEATURES, ELEVATIONS PRIOR TO STARTING WORK.
2. PROTECT EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION. PROVIDE TEMPORARY SUPPORT AS NEEDED.
3. SAWCUT ALL PAVEMENT AND CONCRETE AT CUTS. MATCH EXISTING GRADE WHERE RESTORING NEW PAVEMENT TO EXISTING PAVEMENT. SEE CITY OF TACOMA STANDARD PLAN NO. SU-15B ON DRAWING C-03.
4. ANY DAMAGE TO LANDSCAPE, UTILITIES, AND PAVEMENT SHALL BE REPLACED AT CONTRACTORS EXPENSE.
5. DAMAGED OR REMOVED CURB SHALL BE REPLACED IN-KIND PER WSDOT STANDARD PLAN F-10.12.
6. WORK LIMITS ARE THE EXTENT OF THE SITE AND DEMOLITION PLAN SHOWN ON THIS DRAWING. COORDINATE WITH PLANT OPERATORS FOR AVAILABLE PARKING, STAGING AND LAYDOWN AREAS NOT SHOWN WITHIN WORK LIMITS.
7. A 12-FOOT CORRIDOR SHALL BE MAINTAINED AT ALL TIMES EAST-WEST ON PLANT ACCESS ROAD FOR DOUBLE TANKER TRUCK INGRESS TO SOLIDS TRUCK LOADING STATION WEST OF THE SOLIDS BUILDING. PROVIDE TRAFFIC RATED STEEL PLATES AND SHORING NECESSARY TO PROTECT OPEN TRENCHES WITHIN PLANT ACCESS ROAD. PROVIDE SIGNAGE, FENCING, AND OTHER MEANS TO DELINEATE WORK AREAS.

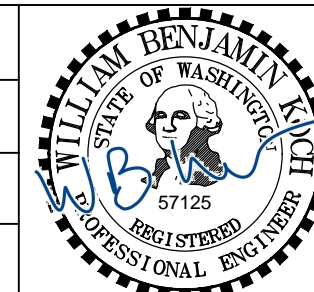
- 1 CONNECT NEW 10" FA TO EXISTING 15" FA BURIED IN ROADWAY PER DETAIL B, SHEET C-02. INVERT ELEVATION OF EXISTING FA 19.48'.
- 2 MULTIPLE UTILITY CROSSINGS EXIST IN THIS AREA. EXCAVATE CAREFULLY ALONG ROUTE. MINIMIZE BENDS IN FA PIPING WHERE POSSIBLE. PROVIDE MINIMUM 2% SLOPE TOWARDS CONNECTION TO EXISTING. REFER TO DRAWING C-02 FOR 10" FA PROFILE.
- 3 DEMOLISH TWO SHRUBS AND ONE 7" TREE. RELOCATE 4" x 4" LANDSCAPING TIMBER PARALLEL TO NEW CONCRETE PAD.
- 4 DEMOLISH RIVER ROCK GROUNDCOVER TO EXTENTS NECESSARY TO INSTALL NEW CONCRETE FOUNDATIONS AND SIDEWALK. SEE MECHANICAL AND STRUCTURAL DRAWINGS.
- 5 DEMOLISH EXISTING 4" FA PIPE. CUT AND CAP PIPE 2' ABOVE GRADE AND 1' ABOVE TOP OF SOLIDS TANK. DEMOLISH ALL SUPPORTS. SEE SECTION B/M-04.
- 6 CONNECT NEW 3" PD TO EXISTING 8" SLUDGE OVERFLOW. INVERT ELEVATION ASSUMED FROM RECORD DRAWINGS IS 20.6'. EXISTING PIPING SLOPES AWAY FROM SOLIDS HOLDING TANK. SPLICE TEE INTO SLUDGE OVERFLOW TO CONNECT TO NEW PD, UTILIZING NEW REDUCING TEE AND TWO FERNCO 1051-88 COUPLINGS, OR SIMILAR, DEPENDING ON DIAMETER AND MATERIAL OF EXISTING 8" LINE.
- 7 CENTER OF ODOR CONTROL BIOSCRUBBER LOCATED FROM CORNER OF CHLORINE CONTACT BASIN.
- 8 REMOVE EXISTING SIDEWALK.
- 9 INSTALL BLIND FLANGE OR RESTRAINED MJ PLUG ON 18" BFE LINE FOR FUTURE USE.
- 10 4" ISOLATION VALVE FOR 1" PRW TIE-IN TO EXISTING 2" W2H.

Brown AND Caldwell



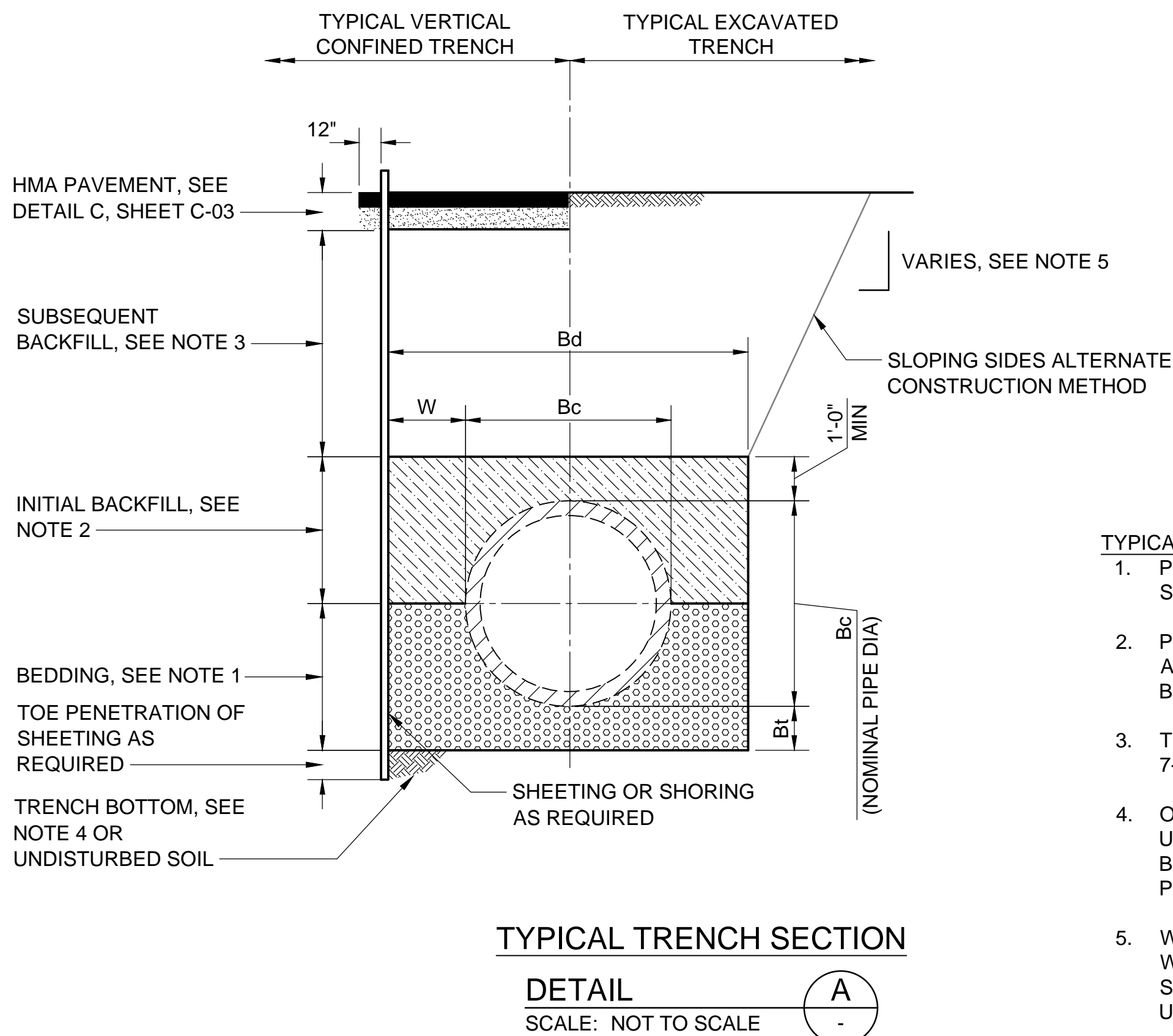
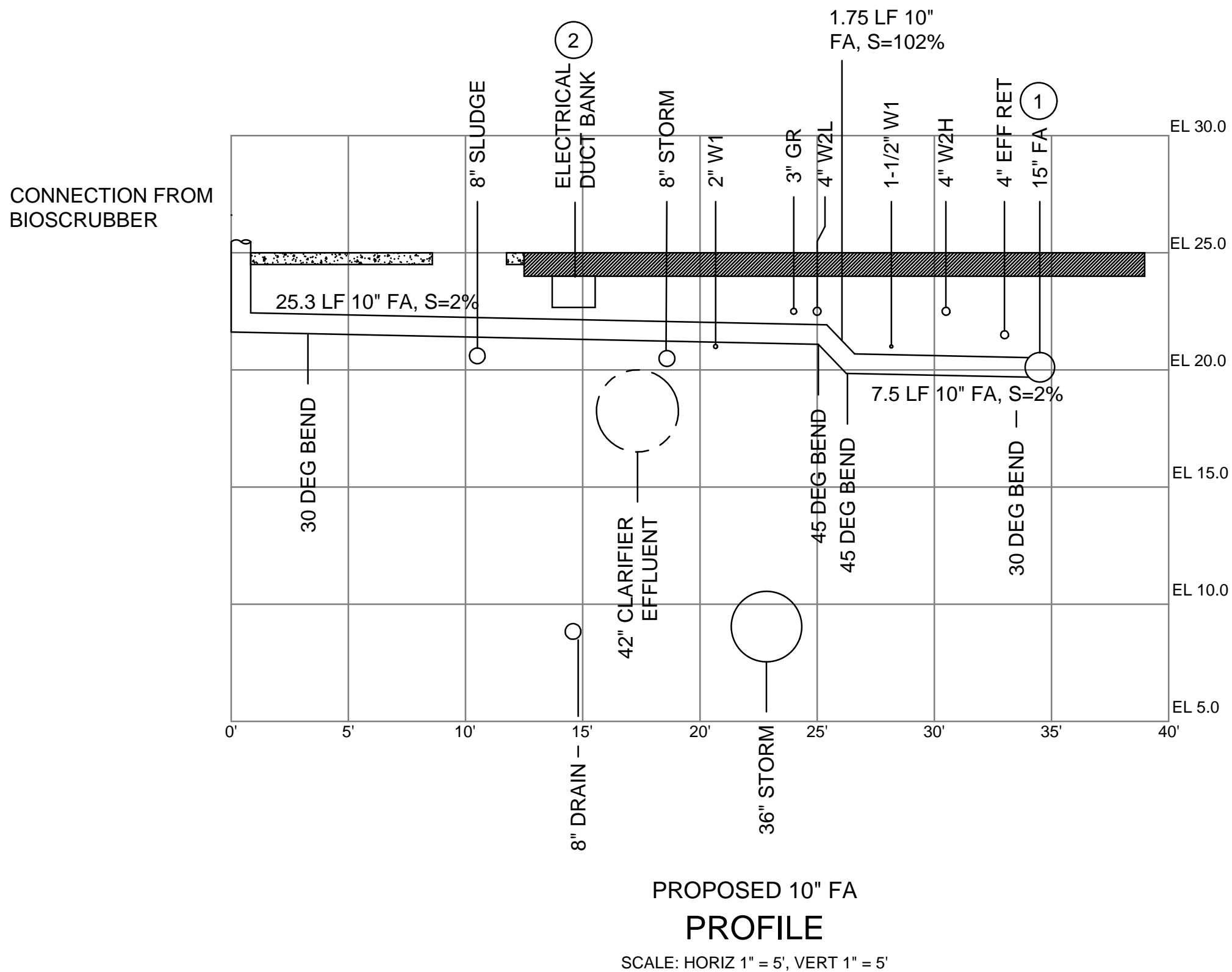
				FINAL CONSTRUCTION CHECKED
				BY
				DATE
NO	R E V I S I O N		DATE	APPROVED
FIELD BOOKS				

DATE 5/5/2021	SCALE 1" = 5'
DESIGNED WBK	CHECKED DJM
DRAWN WBK	PROJECT NAME
DRAWING NAME 152790 C-01	



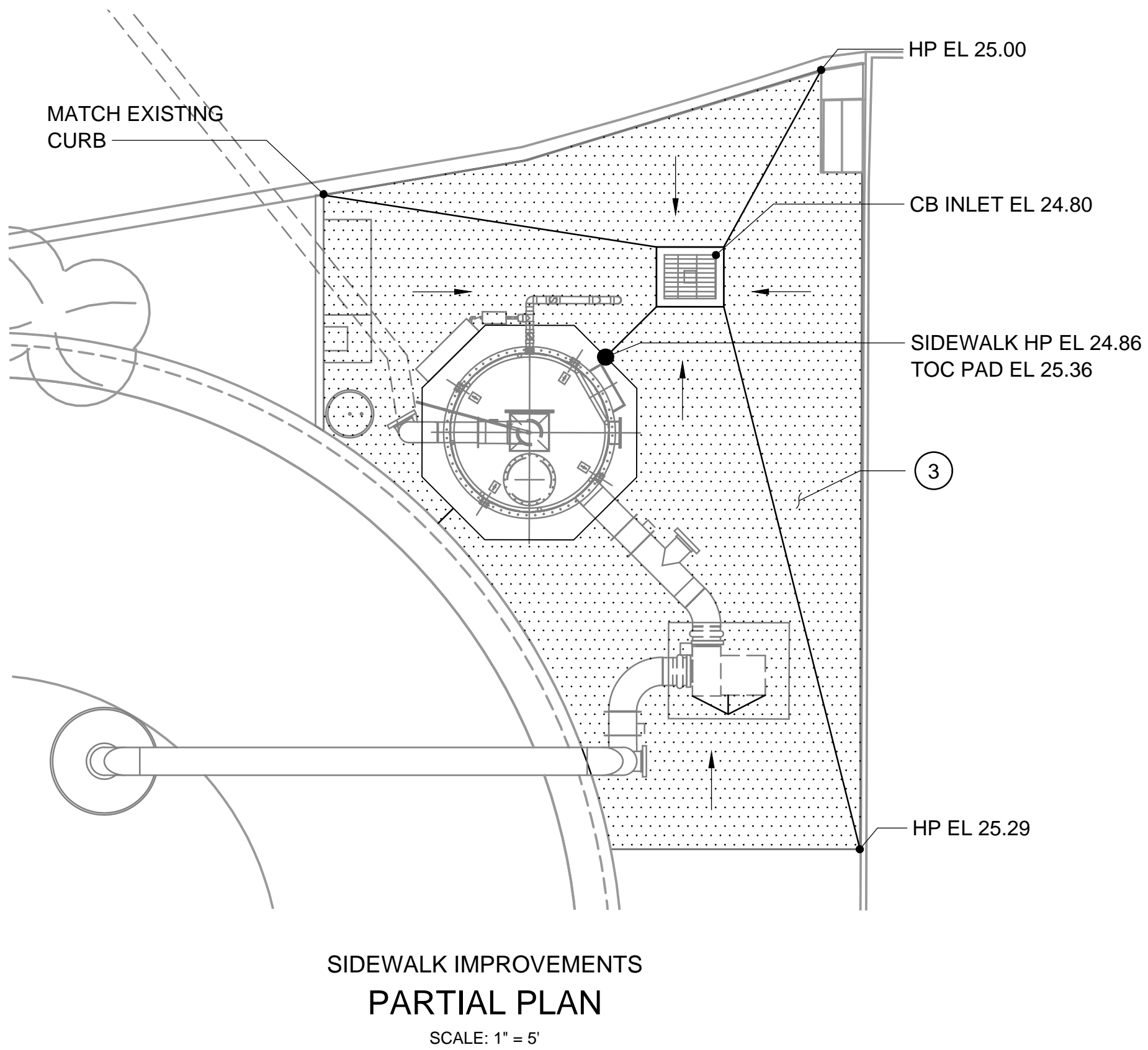
CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT
NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
SITE AND DEMOLITION PLAN

DRAWING NO.	C-01
WBS NO.	ES22-0060F ENV-04016-07
SHEET NO.	4 of 19



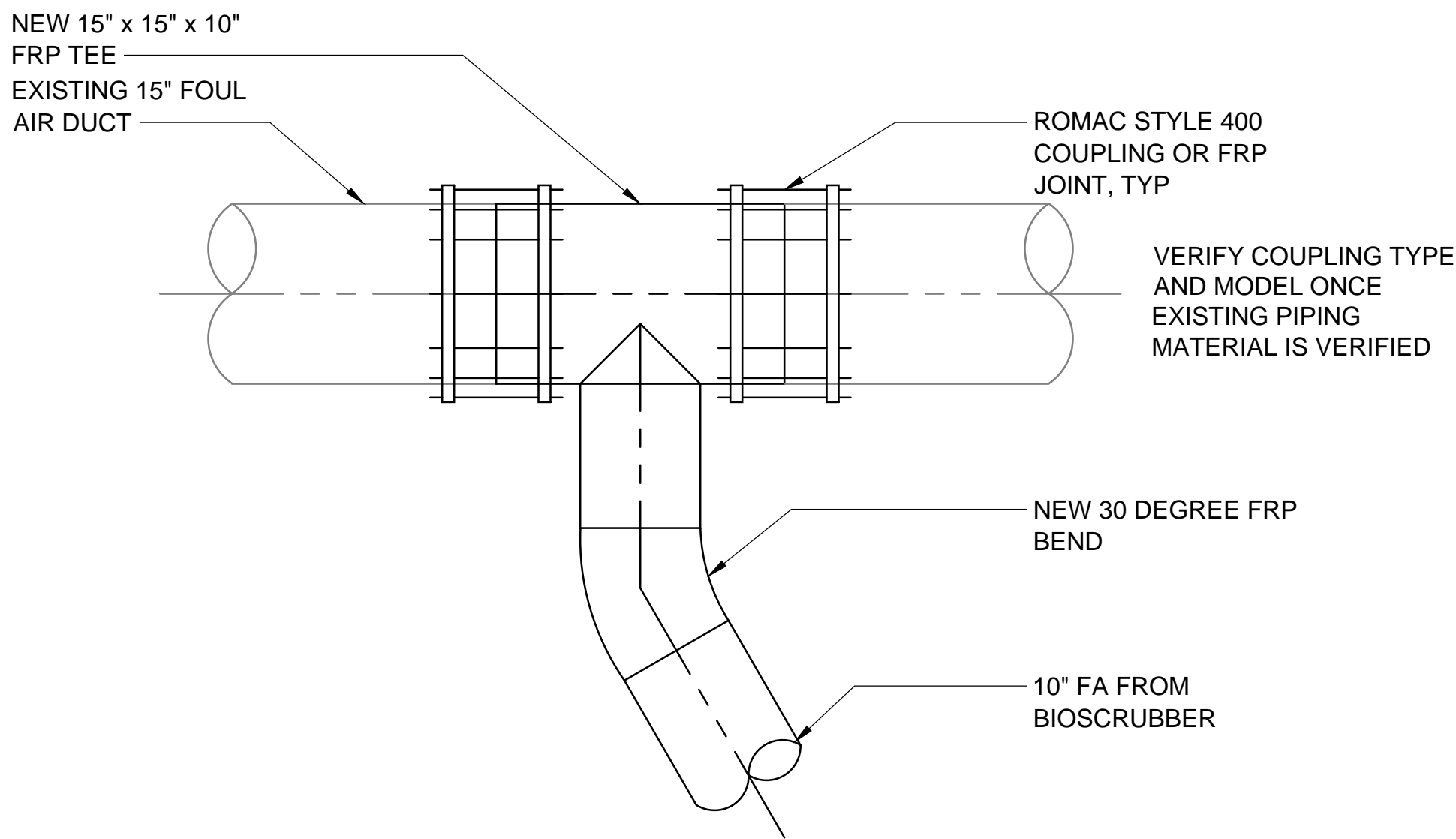
Bc INCHES	W MIN INCHES	Bd MAX INCHES	Bt MAX INCHES
0-6	6	Bc + 24	6
8-24	8	Bc + 24	6

- TYPICAL TRENCH NOTES:
- PIPE BEDDING FOR MATERIAL PER WSDOT STD SPECIFICATION 9-03.12(3)
 - PIPE ZONE MATERIAL:
 - PIPE BEDDING THERMOPLASTIC AND FRP PIPES
 - TRENCH BACKFILL FOR METAL PIPES
 - TRENCH BACKFILL PER WSDOT STD SPECIFICATION 7-08.3(3)
 - OVEREXCAVATION REQUIRED BY ENGINEER WHERE UNSUITABLE SOILS ARE EXPOSED AT SUBGRADE. BACKFILL OVEREXCAVATION WITH STRUCTURAL FILL PER WSDOT STD SPECIFICATION 9-03.14(2)
 - WHERE THE ALLOWABLE SIDE SLOPE OF EXCAVATIONS WOULD CUT WITHIN 5 FEET OF EXISTING OR NEW STRUCTURES AND PIPELINES, SHEETING, SHORING, OR UNDERPINNING SHALL BE UTILIZED.

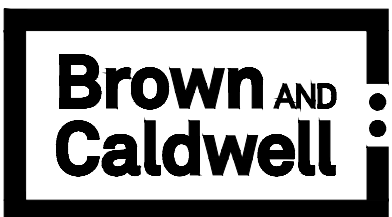


- GENERAL NOTES:
- EXISTING UTILITIES ARE BASED ON RECORD INFORMATION AND A LIMITED SURVEY PROVIDED BY THE CITY OF TACOMA. FIELD VERIFY LOCATIONS AND SIZED OF EXISTING STRUCTURES, EQUIPMENT, PIPES, FEATURES, ELEVATIONS, ETC. PRIOR TO STARTING WORK.
 - PROTECT EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.
 - SLOPE SIDEWALK TOWARDS DRAIN AT 1/4" PER FOOT.

- KEY NOTES:
- CONNECT NEW 10" FA TO EXISTING 15" FA BURIED IN ROADWAY PER DETAIL B, THIS SHEET. INVERT ELEVATION OF EXISTING FA SURVEYED BY CITY IN SEPTEMBER 2019 IS 19.48'.
 - ELECTRICAL DUCTBANK SHALL BE TREATED AS CONTAINING LIVE CONDUCTORS FOR BIDDING PURPOSES.
 - SLAB ON GRADE SIDEWALK PER WSDOT STANDARD PLAN F-30.10-03, EXCEPTING SIDEWALK SHALL BE 5" THICKNESS, WITH MAXIMUM 5-FOOT PANELS CONTAINING SCORE MARKS $\pm 1/8"$ WIDE BY $\pm 1/4"$ DEEP. FOR SIDEWALKS OVER 8' IN WIDTH, A LONGITUDINAL SCORE MARK SHALL BE MADE ALONG CENTER OF WALKING SURFACE. PROVIDE 2" CRUSHED SURFACING TOP COURSE ON COMPACTED SUBGRADE. FORM AND SUBGRADE INSPECTION REQUIRED BEFORE POURING CONCRETE. W4.0 X W4.0 WELDED WIRE FABRIC AT 2-INCHES FROM BOTTOM OF SLAB ON GRADE SIDEWALK. APPLY A LIGHT BROOM FINISH. SIDEWALK IS A NON-DRIVING SURFACE. H-20 LOADING IS NOT ALLOWABLE.



CONNECTION TO EXISTING 15" FA
DETAIL B
SCALE: NOT TO SCALE



AT FULL SCALE
0 1/2 1
(IF NOT 1", SCALE ACCORDINGLY)



NO

REVISION

DATE

APPD

FINAL
CONSTRUCTION
CHECKED

DATE
5/5/2021

SCALE

BY

DESIGNED
WBK

CHECKED
DJM

DATE

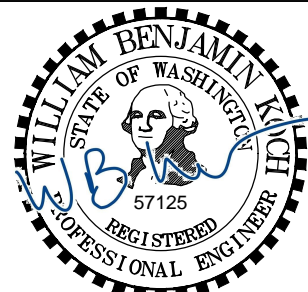
DRAWN
WBK

PROJECT NAME

FIELD BOOKS

DRAWING NAME

152790 C-02



CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT
NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
CIVIL DETAILS AND FOUL AIR PROFILE

DRAWING NO.

C-02

WBS NO.

ES22-0060F
ENV-04016-07

SHEET NO.

SHEET 5

OF 19

NOTES

1. This Standard Plan shall only apply to streets that are exempt from the City of Tacoma's Restoration Policy. See Standard Plan SU-15A for any streets not exempt from this policy.

2. Temporary Surface Restoration:
Arterials, industrial areas and/or roads with bus traffic: Temporary patches shall be compacted and leveled to a minimum of 3-inches of hot-mix asphalt (HMA).
~~Residential and alleys: Temporary patches shall be compacted and leveled to a minimum of 2-inches of either HMA or cold-mix asphalt. Temporary patches between October 1st and March 31st shall be made with HMA unless otherwise approved.~~

3. All permanent final patches shall be rectangular in shape and constructed parallel and perpendicular to the road centerline.

4. Where existing pavement defects are in close proximity to the new cut, the inspector may require additional pavement removal to eliminate the pavement defect.

5. The final cut edge of paved surfaces shall be smooth and straight, consistent with grinding or saw cutting devices. No jagged, broken or undermined edges are allowed. Cutting wheel run-out beyond the limits of the opening shall be filled in accordance with WSDOT Standard Specification 5-05.3(8)B for cement concrete surfaces and 5-04.3(5)C for asphalt concrete surfaces.

6. Final compaction of HMA shall be 91% of maximum density.
Testing shall be performed by a certified independent testing laboratory or certified tester, as approved by the City's Construction Division. Tests shall be completed and reports identifying the project number submitted to the City Construction Division within 48 hours of test.

7. All joints between the new and original asphalt pavement shall be sealed with hot asphalt or asphalt emulsion and covered with dry paving sand before the asphalt solidifies. Existing surfaces shall be prepared in accordance with WSDOT Standard Specification 5-04.3(5)A prior to placing any new pavement surfaces.

8. HMA pavement shall not be placed over CDF until approved by the City.

9. If remaining pavement adjacent to the patch is less than 3' wide, remove and replace with asphalt concrete pavement to match existing (minimum 2").

TABLE 1
PAVEMENT REPLACEMENT DEPTH
IN CUT BACK ZONE

	MIN.	MAX.
ARTERIALS, INDUSTRIAL AREAS & ROADS WITH BUS TRAFFIC	MATCH EXISTING +1", OR 4", WHICHEVER IS GREATER	6"
RESIDENTIALS AND ALLEYS	MATCH EXISTING +1", OR 2", WHICHEVER IS GREATER	4"

CUT BACK ZONE

SAWCUT

HMA PAVEMENT
CL. 1/2" PG 64-22,
SEE TABLE 1

EXISTING ASPHALT OR
OIL MAT PAVEMENT

CRUSHED SURFACING
TOP COURSE (CSTC),
MATCH EXISTING
THICKNESS, 8" MIN

12" MIN. CUT BACK OVER
UNDISTURBED SOIL

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

APPROVED FOR PUBLICATION

CITY ENGINEER

7/17/09

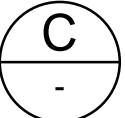
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TYPICAL PAVEMENT RESTORATION
FOR ASPHALT CONCRETE/OIL MAT
PAVEMENT

STANDARD PLAN NO. SU-15B

TYPICAL PAVEMENT RESTORATION FOR ASPHALT CONCRETE/OIL MAT PAVEMENT

DETAIL
SCALE: NOT TO SCALE



AT FULL SCALE
0 1/2 1
(IF NOT 1", SCALE
ACCORDINGLY)



NO

REVISION

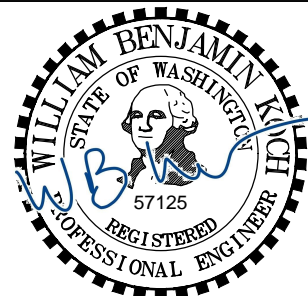
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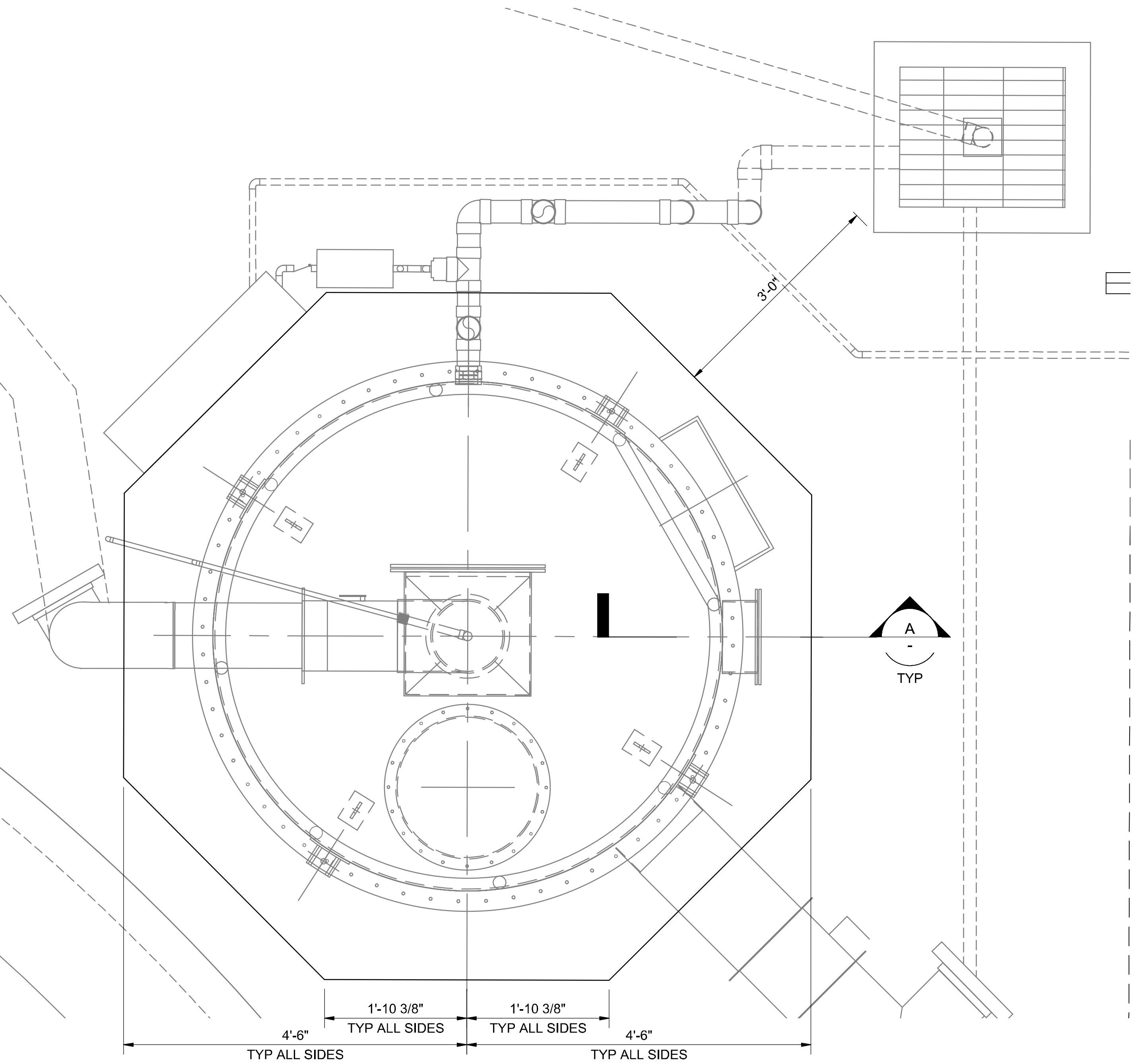
DATE
5/5/2021
DESIGNED
WBK
DRAWN
WBK
DRAWING NAME
152790 C-03

SCALE
CHECKED
DJM
PROJECT NAME



CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT
NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
CIVIL DETAILS

DRAWING NO.
C-03
WBS NO.
ES22-0060F
ENV-04016-07
SHEET NO.
SHEET 6 OF 19



STRUCTURAL
PLAN

SCALE: 1" = 1'-0"

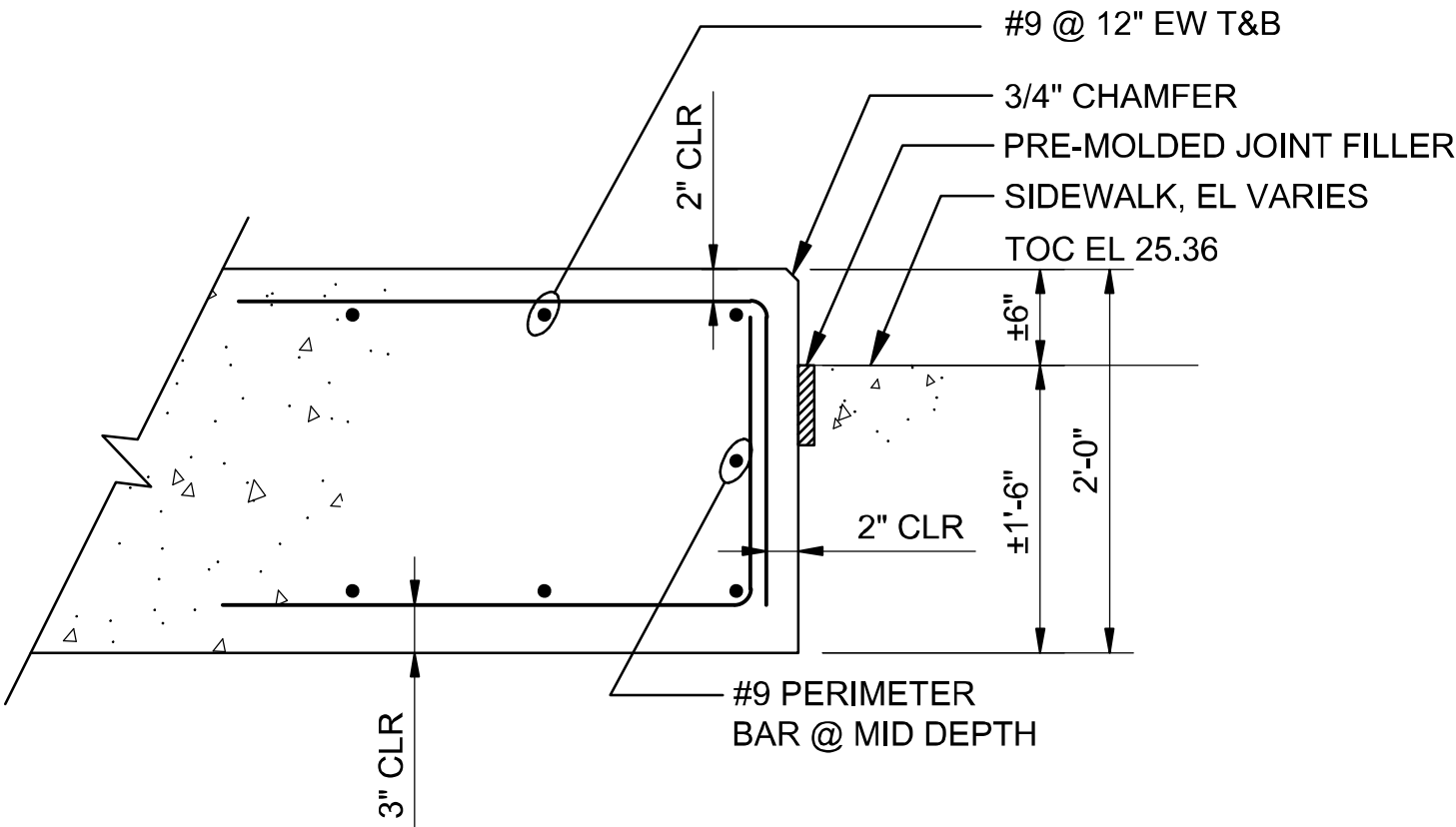
STRUCTURAL NOTES:

- GENERAL
- SG1 REFER TO CIVIL AND MECHANICAL DRAWINGS FOR EQUIPMENT TO BE MOUNTED ON PAD.
- SG2 STRUCTURAL DIMENSIONS CONTROLLED BY OR RELATED TO THE MECHANICAL EQUIPMENT AND DIMENSIONS RELATED TO EXISTING FACILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL CONSTRUCTION DIMENSIONS AND NOTIFYING OWNER OF DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.
- SG3 ANCHOR BOLTS SHALL BE STAINLESS STEEL TYPE 316 MATERIAL UNLESS OTHERWISE NOTED
- DESIGN CRITERIA
- SD1 GOVERNING CODES
2018 INTERNATIONAL BUILDING CODE, ASCE 7-16
MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
- SD2 LIVE LOAD.....100 PSF
- SD3 SNOW LOAD
GROUND SNOW..... 20 PSF
RISK CATEGORY..... III
IMPORTANCE FACTOR, I_s 1.10
EXPOSURE FACTOR, C_e 1.10
THERMAL FACTOR, C_T 1.0
- SD4 WIND LOAD
RISK CATEGORY..... III
BASIC WIND SPEED, V 115 MPH
IMPORTANCE FACTOR, I_w 1.0
EXPOSURE CATEGORY..... C
TOPOGRAPHICAL FACTOR, K_{zt} 1.0
- SD5 SEISMIC
RISK CATEGORY..... III
IMPORTANCE FACTORS, I_c 1.25
 I_p 1.0
MCE ACCELERATION, SHORT PERIOD, S_s .. 1.25 g
MCE ACCELERATION, 1-SEC PERIOD, S_1 0.55 g
SITE CLASS..... D
DESIGN ACCEL, SHORT PERIOD, S_{DS} 0.84 g
DESIGN ACCEL, 1-SEC PERIOD, S_{D1} 0.55 g
SEISMIC DESIGN CATEGORY..... D

- CEMENTITIOUS NON-SHRINK GROUT
- SN1 CEMENTITIOUS NON-SHRINK NONMETALLIC AGGREGATE GROUT SHALL BE FIVE STAR PRODUCTS, INC. FIVE STAR GROUT, MASTER BUILDERS MASTERFLOW 928, BURKE COMPANY NON-FERROUS, NON-SHRINK GROUT, HI-FLOW GROUT BY EUCLID CHEMICAL COMPANY, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S PROCEDURES FOR PLACEMENT AND PERFORMANCE.
- CONCRETE
- SC1 APPLICABLE CODES
CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 301-10 "SPECIFICATIONS FOR STRUCTURAL CONCRETE", AND THE FOLLOWING CODES:
ACI 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"
ACI 350-06 (FOR LIQUID CONTAINING STRUCTURES) - "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES"
- SC2 CONCRETE STRENGTH $f_c = 4,500$ PSI
- SC3 REINFORCING STEEL ASTM 615, GRADE 60 DEFORMED BARS
- SC4 SUBMIT CONCRETE MIX DESIGN AND REBAR SHOP DRAWINGS FOR APPROVAL PRIOR TO CONSTRUCTION.
- STEEL
- SS1 ALL STRUCTURAL STEEL WORK SHALL BE IN ACCORDANCE WITH THE AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (AISC 360-10) AND AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (AISC 303-10).
- SS2 MATERIALS
1. STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. OTHER STEEL SHAPES AND PLATES SHALL CONFORM TO ASTM A36.
2. STRUCTURAL STEEL PIPE SHALL CONFORM TO ASTM A53 TYPES E OR S, GRADE B. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500 GRADE B ($F_y = 46$ KSI).
3. ALL STAINLESS STEEL SHALL BE TYPE 316 MEETING ASTM A276 FOR BARS AND SHAPES, AND ASTM A240 FOR PLATES, UNLESS OTHERWISE SPECIFIED.
- SS3 WELDING
1. WELDING SHALL CONFORM TO AWS D1.1-1 AND AISC 341-10.
2. ELECTRODES FOR SHOP AND FIELD WELDS SHALL CONFORM TO AWS A5.1 OR A5.5, CLASS E70XX.
3. STAINLESS STEEL WELDING SHALL CONFORM TO AWS D1.6 WITH A5.4 OR A5.9 ELECTRODES.
- SS4 BOLTS
HIGH STRENGTH BOLTS SHALL BE FULLY TENSIONED UNLESS CONNECTING HSS SHAPES OR OTHERWISE NOTED. STAINLESS STEEL TYPE 316 BOLTS SHALL BE USED FOR CONNECTION OF STAINLESS STEEL AND ALUMINUM FRAMING.
- SS5 EXPANSION ANCHORS SHALL BE STAINLESS STEEL "KWIK BOLT TZ" BY HILTI INC. OR EQUAL APPROVED BY OWNER.

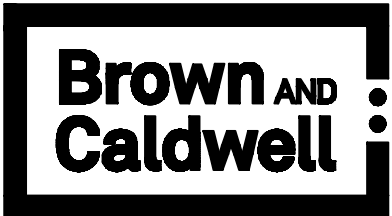
SPECIAL INSPECTIONS:

- SI1 AN INDEPENDENT TESTING COMPANY RETAINED BY THE OWNER AND APPROVED BY THE BUILDING OFFICIAL SHALL INSPECT THE FOLLOWING (SEE EXPANDED LIST ON DRAWINGS S-02 AND S-03, SPECIFICATIONS, AND GOVERNING CODE):
1. SOIL COMPACTION AT FOUNDATIONS.
2. REINFORCING BAR, CONCRETE PLACEMENT AND TAKING OF CONCRETE TEST SPECIMENS.
3. ANCHOR BOLTS.
4. FIELD WELDING OF STRUCTURAL STEEL AND ALUMINUM.
5. SHOP WELDING OF STRUCTURAL STEEL EXCEPT WHERE WELDING IS DONE IN AN AISC APPROVED FABRICATOR'S SHOP IN ACCORDANCE WITH THE PROVISIONS OF THE GOVERNING BUILDING CODE.
6. EXPANSION ANCHOR INSTALLATION.
7. ANCHORS INSTALLED USING EPOXY ADHESIVE.
8. HIGH STRENGTH BOLTING.
9. MECHANICAL AND ELECTRICAL EQUIPMENT, PERIODIC SPECIAL INSPECTION OF STRUCTURAL COMPONENTS FOR SEISMIC RESISTANCE:
A. ANCHORAGE OF ELECTRICAL EQUIPMENT.
B. HVAC AND FOUL AIR DUCTWORK THAT WILL CONTAIN HAZARDOUS MATERIALS.
C. INSTALLATION OF COMPONENTS WHERE THE COMPONENT IMPORTANCE FACTOR IS 1.5.
D. ELECTRICAL MOTORS, TRANSFORMERS, SWITCHGEAR UNIT SUBSTATIONS AND MOTOR CONTROL CENTERS.
E. TANKS, HEAT EXCHANGERS AND PRESSURE VESSELS.
F. EQUIPMENT VIBRATION ISOLATION SYSTEMS.
- SI2 CONTRACTOR SHALL NOTIFY THE TESTING COMPANY FOR ALL INSPECTIONS.

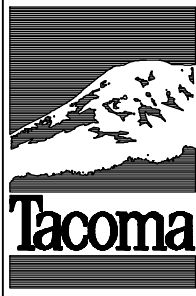


SECTION

SCALE: 1" = 1'-0"



AT FULL SCALE
0 1/2 1
(IF NOT 1", SCALE ACCORDINGLY)



NO

REVISION

DATE

APPD

FINAL
CONSTRUCTION
CHECKED

DATE
5/5/2021

SCALE

BY

DESIGNED
REM

CHECKED
GCB

DATE

DRAWN
WBK

PROJECT NAME

FIELD BOOKS

DRAWING NAME

152790 S-01



CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT

NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
STRUCTURAL PLAN AND DETAILS

DRAWING NO.

S-01

WBS NO.

ES22-0060F
ENV-04016-07

SHEET NO.

SHEET 7

OF 19

TABLE 1				
REQUIRED SPECIAL INSPECTIONS - STRUCTURAL SYSTEMS				
SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
SOILS	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL		X	
	VERIFY SOIL MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE DESIGN BEARING CAPACITY		X	
	PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X	
	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X	SEE TABLE 3
	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	X		SEE TABLE 3
CONCRETE	INSPECT FORMWORK FOR LOCATION AND DIMENSIONS OF MEMBER BEING FORMED		X	
	VERIFY MATERIAL FOR REINFORCEMENT		X	CONTRACTOR TO SUBMIT CERTIFIED MILL TEST REPORTS
	REINFORCING STEEL PLACEMENT		X	
	INSPECT ANCHORS TO BE CAST IN CONCRETE		X	PRIOR TO AND DURING CONCRETE PLACEMENT
	INSPECT POST-INSTALLED CONCRETE ANCHORS: - HORIZONTAL AND UPWARDLY INCLINED ADHESIVE ANCHORS - OTHER ANCHORS UNLESS ICC REPORT REQUIRED CONTINUOUS INSPECTION	X	X	INSPECTION TO CONFORM TO IBC AND TO ANCHOR MANUFACTURER'S RECOMMENDATIONS AND ICC REPORTS
	VERIFY USE OF REQUIRED CONCRETE MIX DESIGN(S)		X	
	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND TEMPERATURE OF CONCRETE	X		CONTINUOUS DURING PREPARATION OF SAMPLES
	CONCRETE PLACEMENT	X		
	INSPECTION FOR MAINTENANCE OF CURING PROCEDURES AND TEMPERATURE		X	VERIFY APPROPRIATE CURING METHOD HAS BEEN IMPLEMENTED AFTER EACH POUR
	VERIFY IN-SITU CONCRETE STRENGTH PRIOR TO REMOVAL OF SHORES AND FORMS FROM STRUCTURAL SLABS AND BEAMS		X	
	CEMENTITIOUS GROUTING OF BASE PLATES AND EPOXY GROUTING FOR EQUIPMENT MOUNTING	X		

TABLE 1				
REQUIRED SPECIAL INSPECTIONS - STRUCTURAL SYSTEMS				
SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
STRUCTURAL STEEL AND ALUMINUM	FABRICATION OF STRUCTURAL ELEMENTS			FABRICATOR SHALL BE APPROVED IN ACCORDANCE WITH IBC, CHAPTER 17 TO PERFORM WORK WITHOUT SPECIAL INSPECTION
	VERIFY MATERIAL OF ANCHOR BOLTS AND THREADED RODS		X	CONTRACTOR TO SUBMIT MANUFACTURER'S CERTIFIED TEST REPORTS
	VERIFY MATERIAL OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS		X	CONTRACTOR TO SUBMIT MANUFACTURER'S CERTIFIED TEST REPORTS
	VERIFY MATERIAL FOR STRUCTURAL STEEL AND ALUMINUM SHAPES, PLATES, BARS, ETC.		X	CONTRACTOR TO SUBMIT CERTIFIED MILL TEST REPORTS
	VERIFY MATERIALS FOR WELD FILLER MATERIALS		X	
	VERIFY WELDER QUALIFICATIONS		X	CONTRACTOR TO SUBMIT WELDERS CERTIFICATES
	VERIFY USE OF PROPER WELDING PROCEDURES		X	
	INSPECT COMPLETE AND PARTIAL-PENETRATION GROOVE WELDS, MULTI-PASS FILLET WELDS, AND SINGLE-PASS FILLET WELDS GREATER THAN 5/16"	X		
	INSPECT SINGLE-PASS FILLET WELDS LESS THAN OR EQUAL TO 5/16"		X	VISUALLY INSPECT ALL WELDS
	INSPECT HIGH-STRENGTH BEARING-TYPE BOLTED CONNECTIONS		X	
	INSPECT HIGH-STRENGTH SLIP CRITICAL-TYPE BOLTED CONNECTIONS	X		
	VERIFY TYPE, DEPTH AND GAGE OF DECKING AND GRATING		X	
	INSPECT INSTALLATION (ATTACHMENT) OF DECKING AND GRATING		X	
	INSPECT WELDING OF HEADED STUDS IN COMPOSITE STRUCTURAL SLABS		X	
	INSPECT FRAME AND TRUSSES TO VERIFY THAT BRACING, STIFFENERS, MEMBER LOCATIONS AND JOINT DETAILS COMPLY WITH APPROVED CONSTRUCTION DRAWINGS		X	
	INSPECT INSTALLATION OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS		X	

QUALITY ASSURANCE NOTES

1. THE QUALITY OF THE WORKMANSHIP AND THE QUALITY OF THE MATERIALS OF CONSTRUCTION ARE GOVERNED BY THE INTERNATIONAL BUILDING CODE, 2018 EDITION (IBC).
2. ALL NEW STRUCTURES AND MODIFICATIONS TO EXISTING STRUCTURES TO BE CONSTRUCTED AS A PART OF THIS PROJECT ARE CLASSIFIED AS RISK CATEGORY III, WASTE WATER TREATMENT FACILITY, IN ACCORDANCE WITH THE IBC. THE STRUCTURES ARE CLASSIFIED AS SEISMIC DESIGN CATEGORY D.
3. TO ASSURE THE QUALITY OF THE CONSTRUCTION OF THIS PROJECT, STRUCTURAL TESTS, SPECIAL INSPECTION AND STRUCTURAL OBSERVATION WILL BE PERFORMED IN ACCORDANCE WITH IBC, CHAPTER 17.
4. WHERE FREQUENCY OF INSPECTION IS SPECIFIED TO BE CONTINUOUS, THE SPECIAL INSPECTOR IS EXPECTED TO BE PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED AND PROVIDING FULL-TIME OBSERVATION OF THE WORK REQUIRING SPECIAL INSPECTION.
5. WHERE FREQUENCY OF INSPECTION IS SPECIFIED TO BE PERIODIC, THE SPECIAL INSPECTOR IS EXPECTED TO BE PRESENT IN THE AREA WHERE THE WORK HAS BEEN OR IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK (PRIOR TO THE NEXT CONSTRUCTION TASK).
6. SPECIAL INSPECTIONS ARE IN ADDITION TO INSPECTIONS BY THE BUILDING OFFICIALS. CONSTRUCTION IS SUBJECT TO INSPECTION BY THE BUILDING OFFICIAL. COORDINATE WITH BUILDING DEPARTMENT TO DETERMINE REQUIRED INSPECTIONS.
7. CONTRACTOR SHALL PROVIDE ACCESS TO THE WORK FOR REQUIRED INSPECTIONS. CONTRACTOR SHALL PROVIDE NOTIFICATION IN ADVANCE OF REQUIRED INSPECTIONS, TESTING AND STRUCTURAL OBSERVATIONS.

TABLE 1 (Continued)				
REQUIRED SPECIAL INSPECTIONS - STRUCTURAL SYSTEMS				
SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
FRP	VERIFY MATERIAL FOR FRP SHAPES, PLATES, BAR, ETC.		X	
	VERIFY BOLTS, NUTS AND WASHERS USED AT FRP CONNECTIONS		X	
	VERIFY TYPE AND DEPTH OF FRP GRATING		X	
	INSPECT ATTACHMENT OF FRP GRATING TO SUPPORTS		X	

TABLE 2				
REQUIRED SPECIAL INSPECTIONS - NONSTRUCTURAL SYSTEMS				
SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
ARCHITECTURAL	INSPECT WELDING OF GUARD AND HANDRAIL SYSTEMS		X	
MECHANICAL	INSPECT ANCHORAGE OF ALL MECHANICAL SYSTEMS (INCLUDING EQUIPMENT PIPING, DUCT WORK, ETC.) REQUIRING STANDBY POWER		X	
	CERTIFICATE OF COMPLIANCE FOR ALL MECHANICAL EQUIPMENT REQUIRING STANDBY POWER			EQUIPMENT MANUFACTURER SHALL PROVIDE CERTIFICATE OF COMPLIANCE
ELECTRICAL	INSPECT ANCHORAGE OF ELECTRICAL EQUIPMENT FOR STANDBY POWER		X	
	INSPECT ANCHORAGE OF ALL OTHER ELECTRICAL EQUIPMENT REQUIRING STANDBY POWER		X	
	CERTIFICATE OF COMPLIANCE FOR ALL ELECTRICAL EQUIPMENT FOR STANDBY POWER AND ALL ELECTRICAL EQUIPMENT REQUIRING STANDBY POWER			EQUIPMENT MANUFACTURER SHALL PROVIDE CERTIFICATE OF COMPLIANCE
	EMERGENCY LIGHTING		X	

TABLE 3			
REQUIRED TESTING FOR SPECIAL INSPECTIONS			
SYSTEM OR MATERIAL	TESTING		REMARKS
	CODE OR STANDARD REFERENCE	FREQUENCY	
GEOTECHNICAL			
PREPARED SUBGRADE DENSITY	ASTM D6938	EACH 300 SF OF PREPARED SUBGRADE	
FILL IN-PLACE DENSITY	ASTM D6938	EACH 300 SF OF EACH LIFT PLACED EACH DAY	
CONCRETE			
CONCRETE COMPRESSIVE STRENGTH	ASTM C31,ASTM C39,ASTM C172	WHENEVER CYLINDERS ARE CAST	TEST 2" CUBES FOR EACH GROUT SHIPMENT TO THE FIELD
CONCRETE SLUMP	ASTM C143	WHENEVER CYLINDERS ARE CAST	
CONCRETE AIR CONTENT	ASTM C231	WHENEVER CYLINDERS ARE CAST	
CONCRETE TEMPERATURE	ASTM C1064	WHENEVER CYLINDERS ARE CAST	
CEMENTITIOUS AND EPOXY GROUT COMPRESSIVE STRENGTH	ASTM C942 (CEMENTITIOUS) ASTM C579 (EPOXY)		

TABLE 1: INSTRUMENT TAG IDENTIFICATION LETTERS ****																												
INSTRUMENT FUNCTION MEASURED VARIABLE		ELEMENT	TRANSMITTER	INDICATING TRANSMITTER	CONVERTER TRANSDUCER, RELAY SPECIAL DEVICES	INDICATOR	RECORDER	CONTROLLER	INDICATING CONTROLLER	RECORDING CONTROLLER	SWITCH	SWITCH LOW LOW	SWITCH LOW	SWITCH HIGH	SWITCH HIGH HIGH	SWITCH COMBINATION HIGH LOW	OPENED / CLOSED (OC)	ALARM LOW LOW	ALARM LOW	ALARM HIGH	ALARM HIGH HIGH	GENERAL / COMMON ALARM	TOTALIZE INDICATOR TRANSMITTER	VALVE	GAUGE	LIGHT	SPEED SETTING	REMOTE
A	ANALYSIS	AE	AT	AIT	AY	AI	AR	AC	AIC	ARC	AS	ASLL	ASL	ASH	ASHH	ASHL		AALL	AAL	AAH	AAHH					AL		
B	BURNER FLAME	BE	BT	BIT	BY	BI	BR	BC	BIC	BRC	BS	BSLL	BSL	BSH	BSHH			BALL	BAL	BAH	BAHH					BL		
C																												
D																												
E	VOLTAGE					EI		EC					ESL						EAL									
F	FLOW	FE	FT	FIT	FY	FI	FR	FC	FIC	FRC	FS	FSL	FSL	FSH	FSHH	FSHL		FALL	FAL	FAH	FAHH		FQI		FG	FL		
FF	FLOW RATIO				FFY	FFI		FFC	FFIC		FFS															FFL		
G	GAUGING (DIMENSION)																											
H	HAND (MANUAL)*										HS*																	
I	CURRENT		IT	IIT	IY	II	IR	IC	IIC	IRC	IS	ISLL	ISL	ISH	ISHH	ISHL		IALL	IAL	IAH	IAHH					IL		
J	POWER	JE	JT	JIT							JS	JSLL	JSL	JSH	JSHH	JSHL		JALL	JAL	JAH	JAHH	JF						
K	TIME				KY	KI	KR	KC	KIC	KRC	KS	KSLL	KSL	KSH	KSHH			KALL	KAL	KAH	KAHH					KL		
L	LEVEL	LE	LT	LIT	LY	LI	LR	LC	LIC	LRC	LS	LSLL	LSL	LSH	LSHH	LSHL		LALL	LAL	LAH	LAHH				LG	LL		
LD	LEVEL DIFFERENTIAL					LDI													LDAL	LDAH								
M	MOISTURE OR HUMIDITY	ME	MT	MIT	MY	MI	MR	MC	MIC	MRC	MS	MSLL	MSL	MSH	MSHH			MALL	MAL	MAH	MAHH					ML		
N	TORQUE										NS			NSH	NSHH					NAH								
O																												
P	PRESSURE OR VACUUM	PE	PT	PIT	PY	PI	PR	PC	PIC	PRC	PS****	PSLL	PSL	PSH	PSHH	PSHL		PALL	PAL	PAH	PAHH					PL		
PD	DIFFERENTIAL PRESSURE		PDT	PDIT	PDY	PDI	PDR	PDC	PDIC	PDRC	PDS	PDSLL	PDSL	PDSH	PDSHH			PDALL	PDAL	PDAH	PDAHH					PDL		
Q	QUANTITY	QE	QT	QIT	QY	QI	QR				QS	QSLL	QSL	QSH	QSHH			QALL	QAL	QAH	QAHH							
R	RADIOACTIVITY																											
S	SPEED / STROKE	SE	ST	SIT	SY	SI	SR	SC	SIC	SRC	SS	SSLL	SSL	SSH	SSHH			SALL	SAL	SAH	SAHH							
T	TEMPERATURE	TE	TT	TIT	TY	TI	TR	TC	TIC	TRC	TS	TSLL	TSL	TSH	TSHH	TSHL		TALL	TAL	TAH	TAHH					TL		
TD	DIFFERENTIAL TEMPERATURE		TDT	TDIT	TDY	TDI	TDR	TDC	TDIC	TDRC	TDS	TDSLL	TDSL	TDSH	TDSHH			TDALL	TDAL	TDAH	TDAHH					TDL		
U	MULTIVARIABLE					UI	UR	UC	UIC	URC	US															UL		
V	VIBRATION	VE	VT	VIT	VY	VI	VR	VC	VIC	VRC	VS	VSLL	VSL	VSH	VSHH			VALL	VAL	VAH	VAHH					VL		
W	WEIGHT	WE	WT	WIT	WY	WI	WR				WS	WSLL	WSL	WSH	WSHH			WALL	WAL	WAH	WAHH							
X	UNCLASSIFIED	XE	XT	XIT	XY	XI	XR	XC	XIC	XRC	XS	XSLL	XSL	XSH	XSHH			XALL	XAL	XAH	XAHH	XF			XG	XL		
Y	STATUS					YI											YOC					YF				YL**		YR
Z	POSITION	ZE	ZT	ZIT	ZY	ZI		ZC	ZIC		ZS**													ZV**		ZL		

* REFER TO HAND SWITCH / HAND ACTION DESIGNATIONS
** LETTER INDICATES POSITION (O=OPEN, C=CLOSED, R=RAISE, L=LOWER, ETC)
*** COULD ALSO BE PIS - FOR PRESSURE INDICATING SWITCH

**** USE NUMERIC COUNTERS FOR MULTIPLE OCCURENCES OF THE SAME DESIGNATION ASSOCIATED WITH THE SAME EQUIPMENT (YI, YI2, ETC). THE FIRST OCCURENCE WILL NOT BE FOLLOWED BY A NUMBER (YI). THE SECOND OCCURENCE WILL BE YI2, ETC.

TABLE 4: INSTRUMENT TYPE DESIGNATIONS			
AM	AMMONIA	P-SUB	PRESSURE SUBMERSIBLE
CAP	CAPACITANCE	PC	PARTICLE COUNTER
CG	COMBUSTIBLE GAS	PHO	PHOSPHOROUS
CL	CHLORINE	PTOF	PULSE TIME OF FLIGHT
CMF	COROLIUS MASS FLOW	R/I	RESISTANCE TO CURRENT
COND	CONDUCTIVITY	ROT	ROTAMETER
DEN	DENSITY	RTD	RESISTANCE TEMP DETECTOR
DO	DISSOLVED OXYGEN	SB	SLUDGE BLANKET
FMCW	FREQ. MODULATED CONT. WAVE	SC	STREAMING CURRENT
FP	FLOW PACE	SH	SODIUM HYPOCHLORITE
FS	FLOAT	SM	SMOKE DETECTOR
HSF	FLUORIDE	SQRT	SQUARE ROOT EXTRACTOR
H2S	HYDROGEN SULFIDE	TC	THERMOCOUPLE
LEAK	LEAK	TDR	TIME DOMAIN REFLECTOMETRY
LEL	LOWER EXPLOSIVE LIMIT	TEMP	TEMPERATURE
MAG	MAGNETIC	TH	THERMAL
MDC	MAGNETIC DRIVE CONTROLLER	TSS	TOTAL SUSPENDED SOLIDS
MFC	MASS FLOW CONTROLLER	TURB	TURBIDITY
MO	MOTION DETECTOR	US	ULTRASONIC
O ₂	OXYGEN	UVI	UV INTENSITY
O3	OZONE	UVT	UV TRANSMITTANCE
ORP	OXIDATION REDUCTION POTENTIAL	VAC	VACUUM
PD	PRESSURE DIFFERENTIAL	VEL	VELOCITY
PRESS	PRESSURE	VM	VENTURI
pH	POTENTIAL HYDROGEN		

TABLE 5: DISCRETE I/O TYPE DESIGNATIONS			
ALM	ALARM (HORN / LIGHT)	MSF	MOTOR START FORWARD
AUX1*	RUNNING	MSH	MOTOR START HIGH
AUX2*	FAILED	MSL	MOTOR START LOW
AUX3*	RUN, LATCH, AVAILABLE	MSM	VALVE MODULATE
AUXF	RUNNING FORWARD	MSO	VALVE OPEN
AUXH	RUNNING HIGH	MSP	MOTOR STOP
AUXL	RUNNING LOW	MSR	MOTOR START REVERSE
AUXR	RUNNING REVERSE	MST	MOTOR START
MS	RUN	SVC	SOLENOID VALVE CLOSE
MSC	VALVE CLOSE	SVO	SOLENOID VALVE OPEN

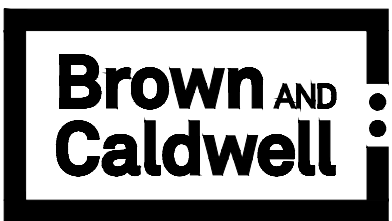
* USE A, B, C, ETC. COUNTERS FOR MULTIPLE OCCURENCES OF THE SAME DESIGNATION ASSOCIATED WITH THE SAME LOOP NUMBER (AUX2A, AUX2B, ETC.).

TABLE 6: SPECIFIC ABBREVIATIONS			
AS	AIR SUPPLY	GS	GAS SUPPLY
CHUTE	CHUTE	HOSE	HOSE
CIP	CLEAN IN PLACE	HPS	HYDRAULIC POWER SUPPLY
CPT	CONTROL POWER TRANSFORMER	HT	HEAT TRACE
CPTS	CATHODIC PROTECTION TEST STATION	HT-INS	HEAT TRACE AND INSULATION
CR	CONTROL RELAY	INS	INSULATION
CW	CITY WATER	PET	PLANT EMERGENCY TRIP
DWP	DOUBLE WALLED PIPE	PQM	POWER QUALITY METER
EPS	ELECTRICAL POWER SUPPLY	PRW	PROTECTED WATER
ETM	ELAPSED TIME METER	SP	SET POINT
FLOW	NOT A PIPE - DEPICTS FLOW PATH	YW	YARD WATER

TABLE 2: HAND SWITCH DESIGNATIONS					
HSA	LOR	LOCAL - OFF - REMOTE	HSM	MNT	MAINTENANCE
HSA	LR	LOCAL - REMOTE	HSN	OO	ON / OFF
HSB	START	START	HSO	OC	OPEN - CLOSE
HSC	STOP	STOP	HSO	OCA	OPEN - CLOSE - AUTO
HSD			HSO	OPEN	OPEN
HSE	E-STOP	EMERGENCY STOP	HSO	OSC	OPEN - STOP - CLOSE
HSE	E-CALL	EMERGENCY CALL	HSP	CLOSE	CLOSE
HSF	FR	FORWARD - REVERSE	HSQ		
HSF	FOR	FORWARD - OFF - REVERSE	HSR	RESET	RESET
HSF	FWD	FORWARD	HSS	SPD	SPEED
HSG			HST	SS	START / STOP
HSH	HOA	HAND - OFF - AUTO	HSU	BYPASS	BYPASS
HSH	OA	OFF - AUTO	HSV	REV	REVERSE
HSI	IC	CURRENT ADJUST	HSW	LH	LOW - HIGH
HSJ	JOG	JOG	HSX	SEL	SELECT
HSK	ACK	ACKNOWLEDGE	HSY	SILENCE	SILENCE
HSL	LAL	LEAD - ALTERNATE - LEAD	HSZ	POS	POSITION
HSL	LL	LEAD - LAG	HSZ	RAISE	RAISE - OFF - LOWER
HSL	LLS	LEAD - LAG - STANDBY			

* USE A, B, C, ETC. (HSX-XXXX-A) FOR MULTIPLE I/O POINTS DERIVED FROM THE SAME SWITCH.
** USE NUMERIC COUNTERS FOR MULTIPLE OCCURENCES OF THE SAME DESIGNATION ASSOCIATED WITH THE SAME EQUIPMENT (HSA, HSA2, ETC). THE FIRST OCCURENCE WILL NOT BE FOLLOWED BY A NUMBER (HSA). THE SECOND OCCURENCE WILL BE HSA2, ETC.

TABLE 3: HAND ACTION DESIGNATIONS (OIT/HMI)					
HAA			HAN	OO	ON / OFF
HAB	START	START	HAO	OC	OPEN - CLOSE
HAC	STOP	STOP	HAO	OSC	OPEN - STOP - CLOSE
HAD	DS	DUTY STANDBY	HAP	PO	PROGRAM - OPERATOR
HAE			HAQ		
HAF	FWD	FORWARD	HAR	RESET	RESET
HAF	FR	FORWARD - REVERSE	HAS	SPD	SPEED
HAG	PURGE	PURGE	HAT	SS	START / STOP
HAH			HAU		
HAI			HAV	REV	REVERSE
HAJ	JOG	JOG	HAW	LH	LOW - HIGH
HAK			HAX	SEL	SELECT
HAL	LL	LEAD - LAG	HAY		UNCLASSIFIED
HAL	LLS	LEAD - LAG - STANDBY	HAZ	POS	POSITION
HAM	SP-OM	OPERATOR MANUAL SP			



AT FULL SCALE
0 1/2 1
(IF NOT 1", SCALE ACCORDINGLY)



NO

R E V I S I O N

DATE

APPD

FINAL
CONSTRUCTION
CHECKED

DATE
5/5/2021

SCALE
NOT TO SCALE

DESIGNED
WBK

CHECKED
DJM

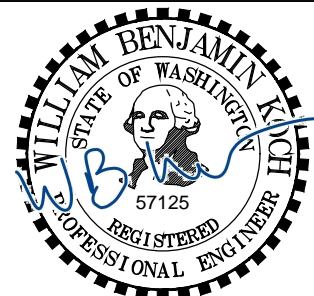
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PROJECT NAME

FIELD BOOKS

DRAWING NAME

152790 P-02



CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT
NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
P&ID SYMBOLS AND ABBREVIATIONS - 2

DRAWING NO.

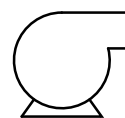
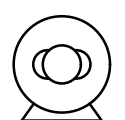
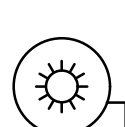
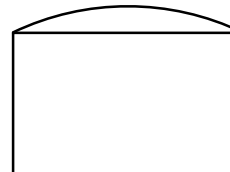
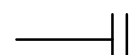
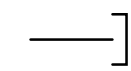
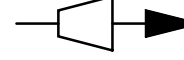
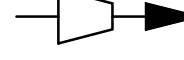



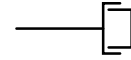

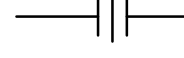

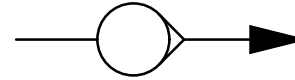

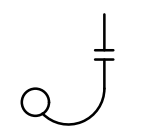









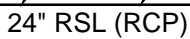
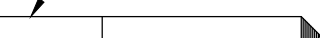
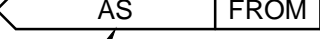
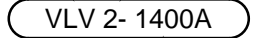



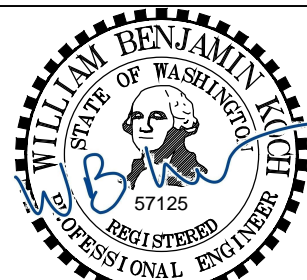
P-02

WBS NO.

ES22-0060F
ENV-04016-07

SHEET NO.

SHEET 11 OF 19

INSTRUMENT LINE SYMBOLS			EQUIPMENT		PIPELINE DEVICES		MEASURING DEVICES			
<div><div>INSTRUMENT OR CONNECTION TO PROCESS</div><div><div>PNEUMATIC SIGNAL</div><div>ELECTRIC SIGNAL</div><div>HYDRAULIC SIGNAL</div><div>CAPILLARY TUBE</div><div>ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)</div><div>ELECTROMAGNETIC OR SONIC SIGNAL (UN-GUIDED)</div><div>INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)</div></div><div><div>ELECTRIC SIGNAL LINE ARROW</div><div>HARDWIRED INTERLOCK</div></div></div> <div><div>FIBER DEVICE LEVEL RING</div><div>COPPER DEVICE LEVEL RING</div><div>HART</div><div>MODBUS</div><div>SERIAL</div><div>CONTROL NET</div><div>COPPER ETHERNET</div><div>FIBER OPTIC ETHERNET</div><div>WIRELESS ETHERNET</div><div>DEVICENET</div><div>PROFIBUS DP</div><div>PROFIBUS PA</div><div>F(DLR)</div><div>C(DLR)</div><div>H</div><div>MB</div><div>S</div><div>CN</div><div>C</div><div>F</div><div>W</div><div>DN</div><div>PBD</div><div>PBA</div></div>			<div><div>CENTRIFUGAL PUMP</div><div>PERISTALTIC PUMP</div><div>CENTRIFUGAL FAN (BLOWER)</div><div>VERTICAL TANK CLOSED TOP</div><div><div>*</div><div>ODOR CONTROL BIOSCRUBBER MANUFACTURER SUPPLIED EQUIPMENT</div></div></div>		<div><div>BLIND FLANGE</div><div>CAP / PLUG</div><div>CONCENTRIC INCREASER</div><div>CONCENTRIC REDUCER</div><div>DRAIN</div><div>EXPANSION COUPLING (STRAIGHT; NON-REDUC./INCREAS.)</div><div>FLEXIBLE CONNECTION</div><div>QUICK CONNECT</div><div>Y-STRAINER</div><div>UNION</div><div>INJECTION QUILL</div></div>		<div><div>ROTAMETER</div><div>MAGNETIC FLOW METER</div><div>FLOAT (BALL TYP.)</div></div>			
PROCESS / FIELD PANEL LINE SYMBOLS			VALVES							
<div><div>NEW</div><div>EXISTING</div><div>FUTURE</div></div> <div><div>EQUIPMENT ENCLOSURE</div><div>PRIMARY PROCESS FLOW IN PIPE</div><div>SECONDARY PROCESS FLOW IN PIPE</div><div>PRIMARY PROCESS FLOW IN CHANNEL OR IN TANK</div></div>			<div><div>MOTOR OPERATOR (OPEN / CLOSE)</div><div>BALL VALVE</div><div>BUTTERFLY VALVE</div><div>CHECK VALVE</div><div>GATE VALVE</div><div>PRESSURE REDUCING VALVE (SELF CONTAINED)</div><div>DIAPHRAGM VALVE</div><div>PRESSURE RELIEF VALVE (PRV)</div></div> <div><div>VALVE POSITIONS</div><div><div>NO</div><div>NC</div><div>FO</div><div>FC</div><div>FLP</div><div>NORMALLY OPEN</div><div>NORMALLY CLOSED</div><div>FAIL OPEN</div><div>FAIL CLOSE</div><div>FAIL LAST POSITION</div></div></div>							
CONNECTORS & PIPE CALLOUT										
<div><div><div>TANK AND/OR CHANNEL</div><div>TYPE (SEE TABLE 6)</div><div>INSULATION /HEAT TRACE OR INFORMATION CALL OUT</div><div>SIZE OF PIPE PIPE MATERIAL (SEE PIPE MATERIAL CODES TABLE ON GENERAL DRAWING) PROCESS SERVICE TYPE (SEE PIPE LABELING TABLE ON GENERAL DRAWING)</div><div>PIPE CALL OUT</div><div>UNIQUE IDENTIFIER</div><div>SHEET CONTINUATION ARROW</div><div>DRAWING NUMBER ORIGIN DESTINATION SERVICE TYPE SUPPLY</div><div>SERVICE TYPE SUPPLY (FOR TYPE REFER TO THE DESIGNATIONS IN THE SPECIFIC ABBREVIATIONS TABLE)</div><div>EQUIPMENT DESIGNATION CODE EQUIPMENT TYPE SEQUENCE NUMBER</div><div>EQUIPMENT CALLOUT</div><div>LOOP# & MODIFIER</div></div></div>										
<div><div></div><div><div>AT FULL SCALE</div><div></div><div>(IF NOT 1", SCALE ACCORDINGLY)</div></div><div></div></div>			<div><div>NO</div><div>REVISION</div><div>DATE</div><div>APPD</div></div>		<div><div>FINAL CONSTRUCTION CHECKED</div><div>DATE</div><div>5/5/2021</div><div>DESIGNED</div><div>WBK</div><div>DRAWN</div><div>WBK</div><div>FIELD BOOKS</div></div> <div><div>SCALE</div><div>NOT TO SCALE</div><div>CHECKED</div><div>DJM</div><div>PROJECT NAME</div><div>DRAWING NAME</div><div>152790 P-03</div></div>		<div></div> <div><div>CITY OF TACOMA</div><div>ENVIRONMENTAL SERVICES DEPARTMENT</div><div>NORTH END WASTEWATER TREATMENT PLANT</div><div>ODOR CONTROL BIOSCRUBBER</div><div>P&ID SYMBOLS AND ABBREVIATIONS - 3</div></div>		<div><div>DRAWING NO.</div><div>P-03</div><div>WBS NO.</div><div>ES22-0060F</div><div>ENV-04016-07</div><div>SHEET NO.</div><div>12</div><div>OF</div><div>19</div></div>	

PCS/OIT

PCM CABINET

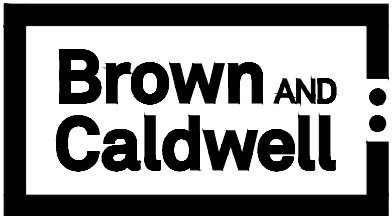
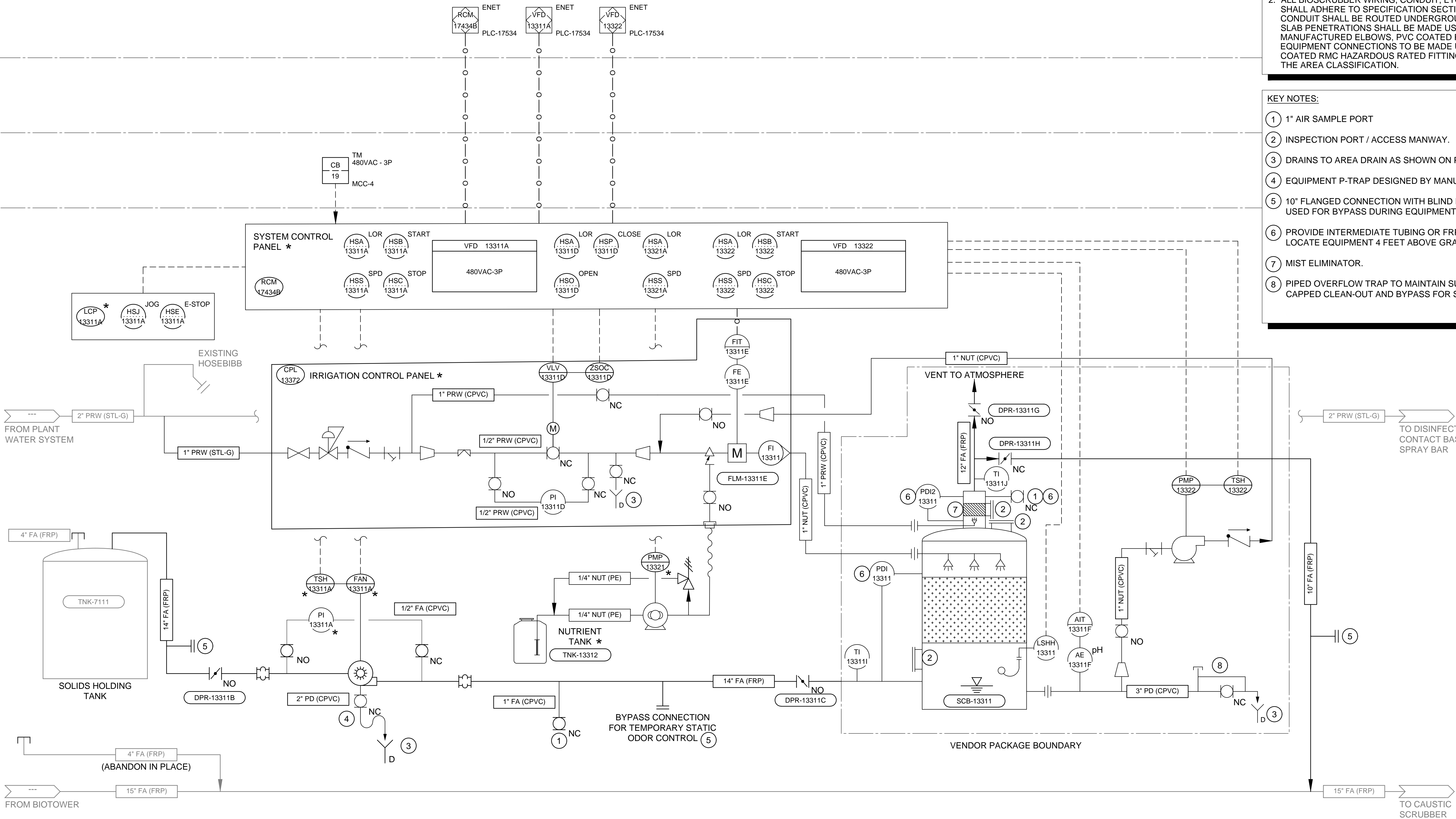
I/O
HMI CONTROL DEVICES

POWER SOURCE

FIELD

- GENERAL NOTES:
1. BIOSCRUBBER EQUIPMENT AND CONTROL PANEL WILL BE SHIPPED LOOSE. CONTRACTOR TO PROVIDE ALL CONDUIT, WIRE, LABOR, ETC., TO CONNECT ALL BIOSCRUBBER EQUIPMENT DURING INSTALLATION. INSTALL PER BIOSCRUBBER MANUFACTURER'S SUPPLIED WIRING SCHEMATICS.
 2. ALL BIOSCRUBBER WIRING, CONDUIT, ETC. INSTALLATION SHALL ADHERE TO SPECIFICATION SECTION 26 05 00.01. CONDUIT SHALL BE ROUTED UNDERGROUND, BELOW SLAB. SLAB PENETRATIONS SHALL BE MADE USING MANUFACTURED ELBOWS, PVC COATED RMC. FINAL EQUIPMENT CONNECTIONS TO BE MADE USING PVC COATED RMC HAZARDOUS RATED FITTINGS, OR LFSC PER THE AREA CLASSIFICATION.

- KEY NOTES:
- ① 1" AIR SAMPLE PORT
 - ② INSPECTION PORT / ACCESS MANWAY.
 - ③ DRAINS TO AREA DRAIN AS SHOWN ON PLANS.
 - ④ EQUIPMENT P-TRAP DESIGNED BY MANUFACTURER.
 - ⑤ 10" FLANGED CONNECTION WITH BLIND FLANGE TO BE USED FOR BYPASS DURING EQUIPMENT OUTAGE.
 - ⑥ PROVIDE INTERMEDIATE TUBING OR FRP PIPING TO LOCATE EQUIPMENT 4 FEET ABOVE GRADE.
 - ⑦ MIST ELIMINATOR.
 - ⑧ PIPED OVERFLOW TRAP TO MAINTAIN SUMP LEVEL, WITH CAPPED CLEAN-OUT AND BYPASS FOR SUMP DRAINAGE.



AT FULL SCALE
0 1/2 1
(IF NOT 1", SCALE ACCORDINGLY)



NO

REVISION

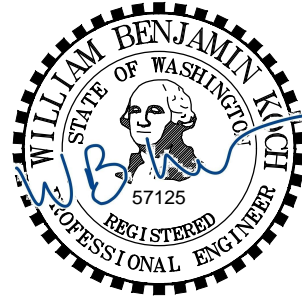
DATE

APPD

FINAL CONSTRUCTION CHECKED
BY
DATE
FIELD BOOKS

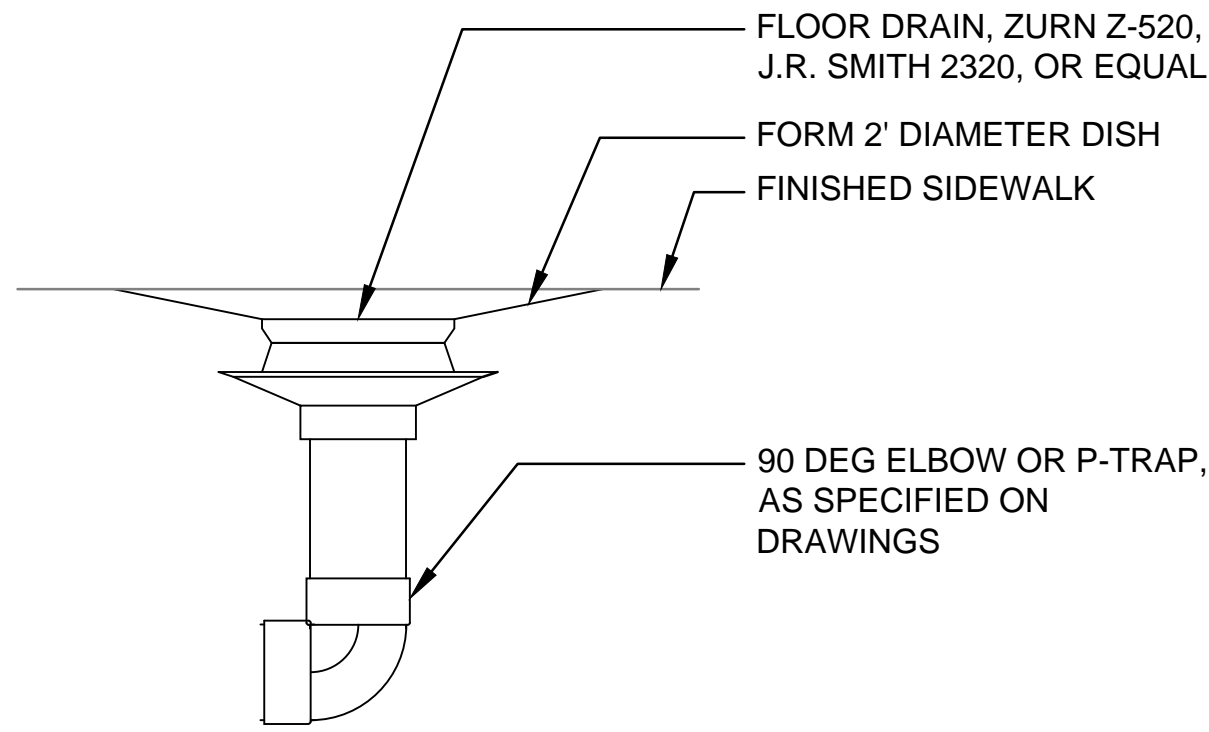
DATE 5/13/2022
DESIGNED WBK
DRAWN WBK
DRAWING NAME 152790 P-04

SCALE NOT TO SCALE
CHECKED SJD/URP
PROJECT NAME



CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT
NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
PROCESS AND INSTRUMENTATION DIAGRAM

DRAWING NO. P-04
WBS NO. ES22-0060F
ENV-04016-07
SHEET NO. 13 OF 19

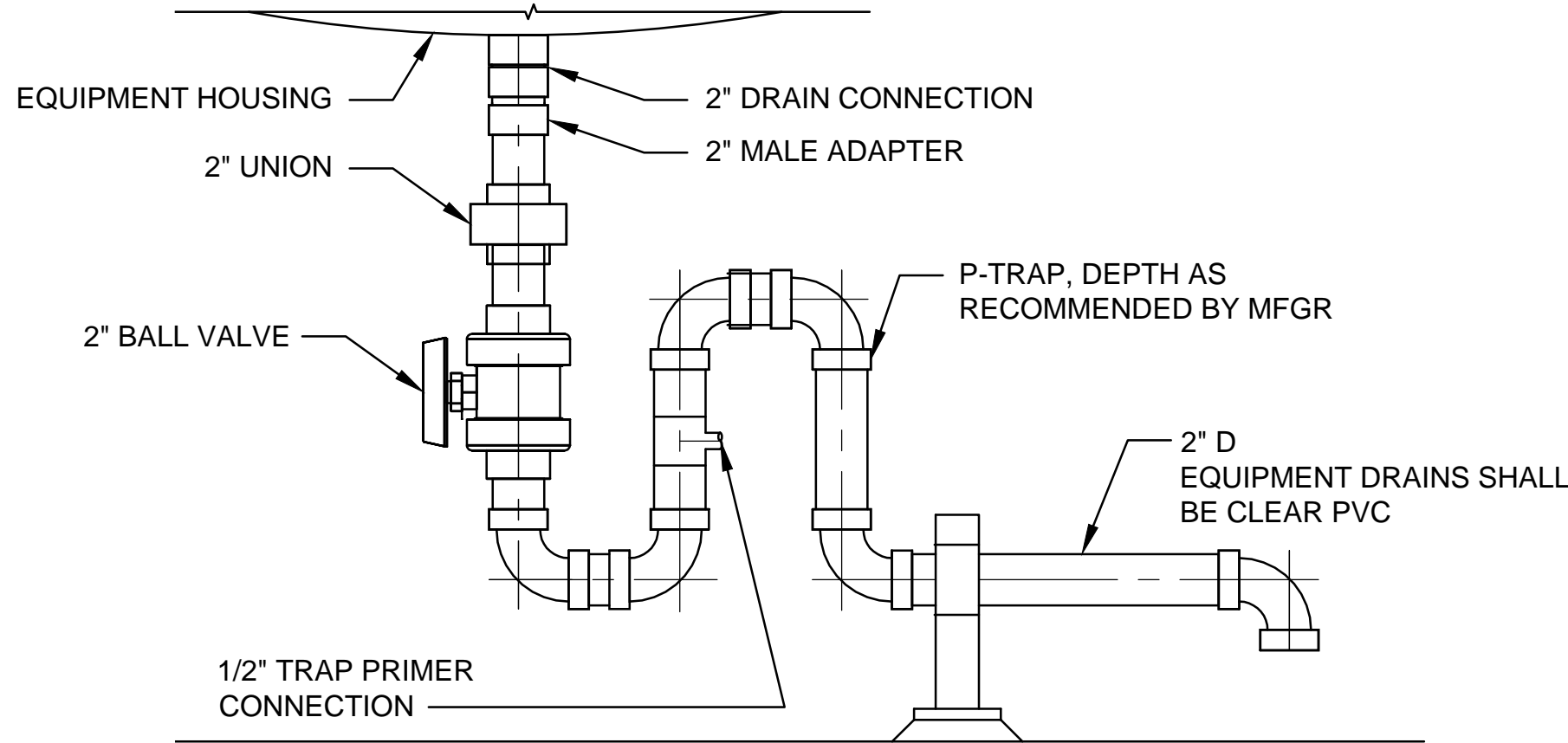


TYPE II DRAIN

DETAIL

SCALE: NOT TO SCALE

A
M-03

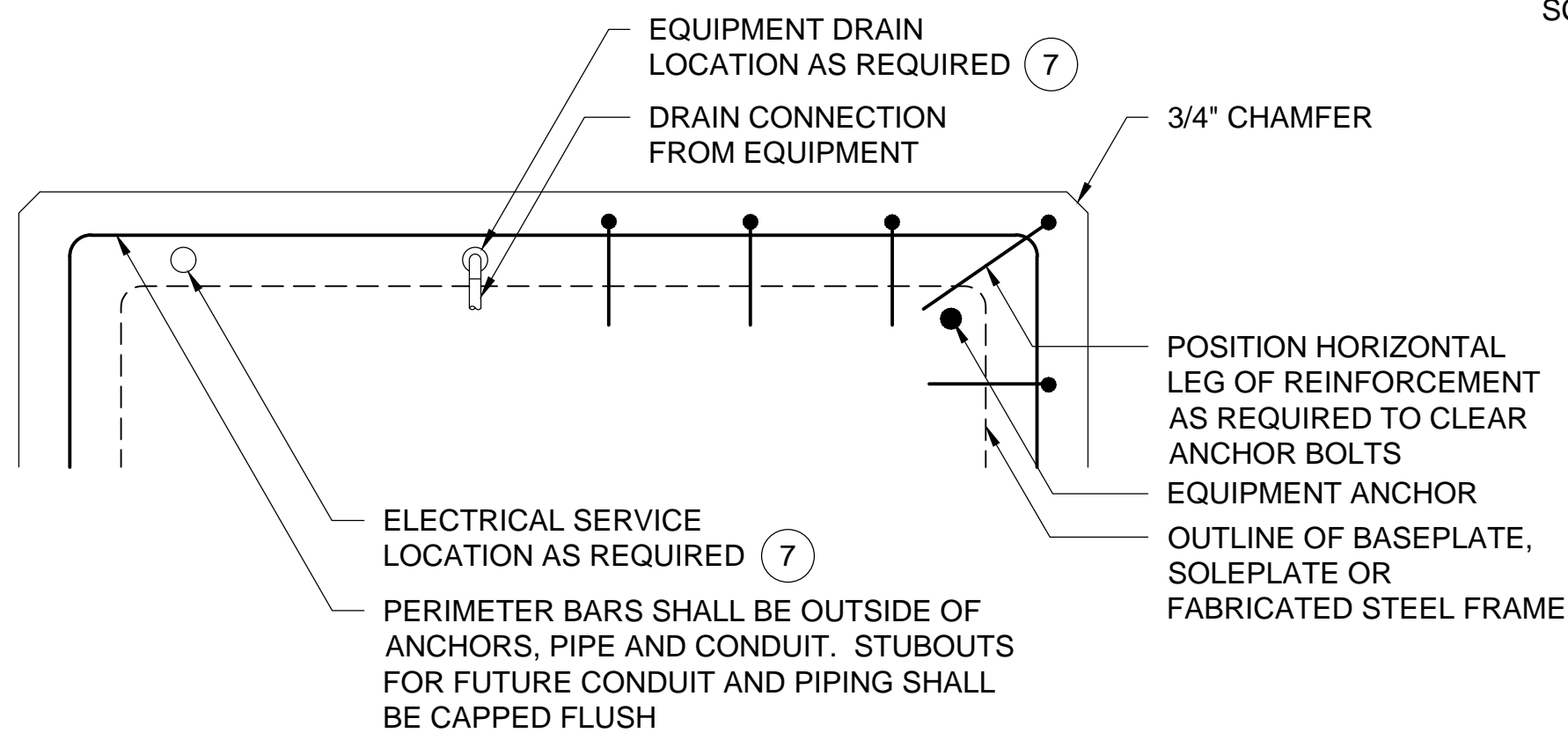


EQUIPMENT HOUSING DRAIN CONNECTION

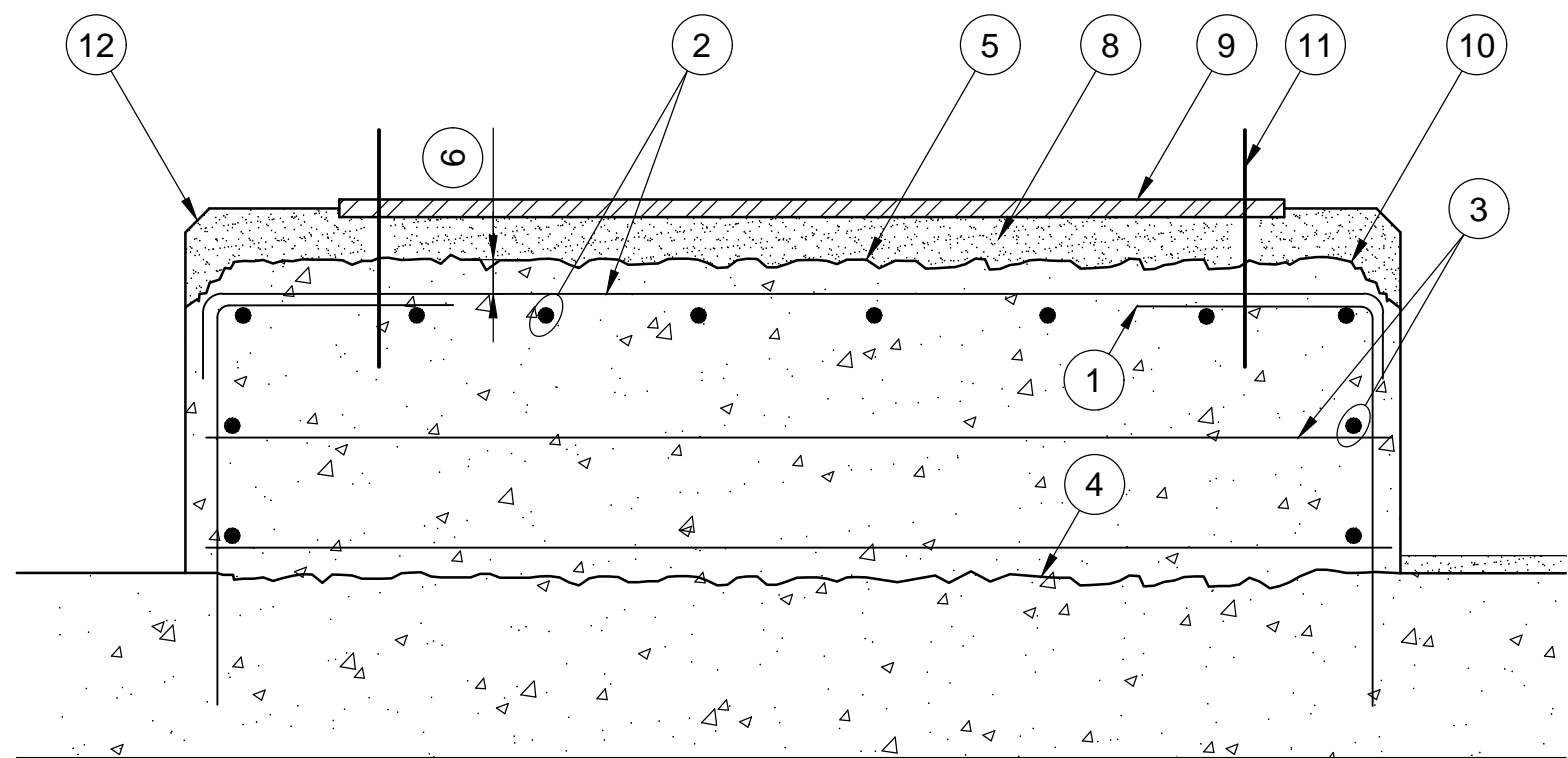
DETAIL

SCALE: NOT TO SCALE

B
M-03



PLAN



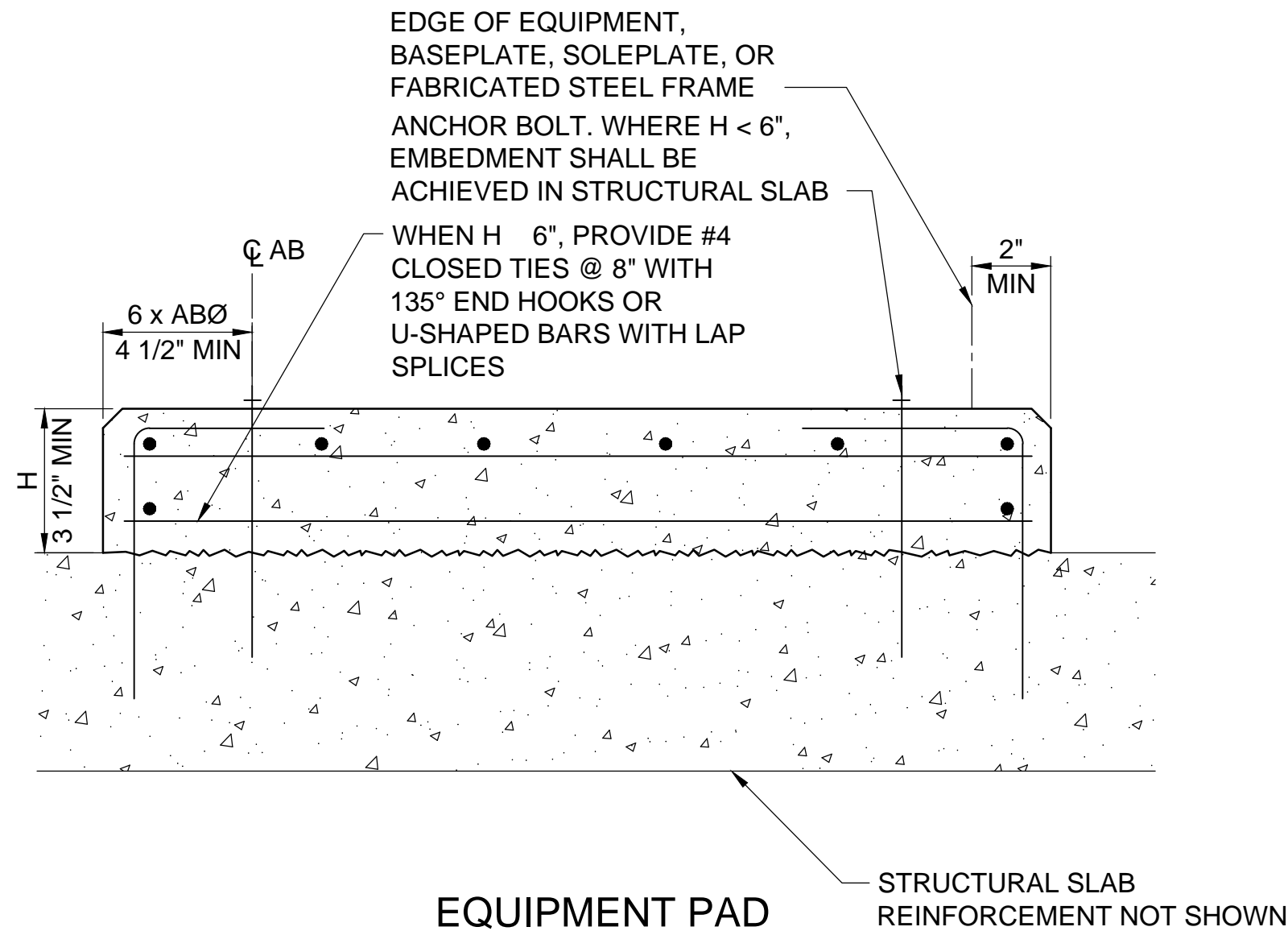
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GENERAL REQUIREMENTS FOR EQUIPMENT PADS

DETAIL

SCALE: NOT TO SCALE

D
M-03



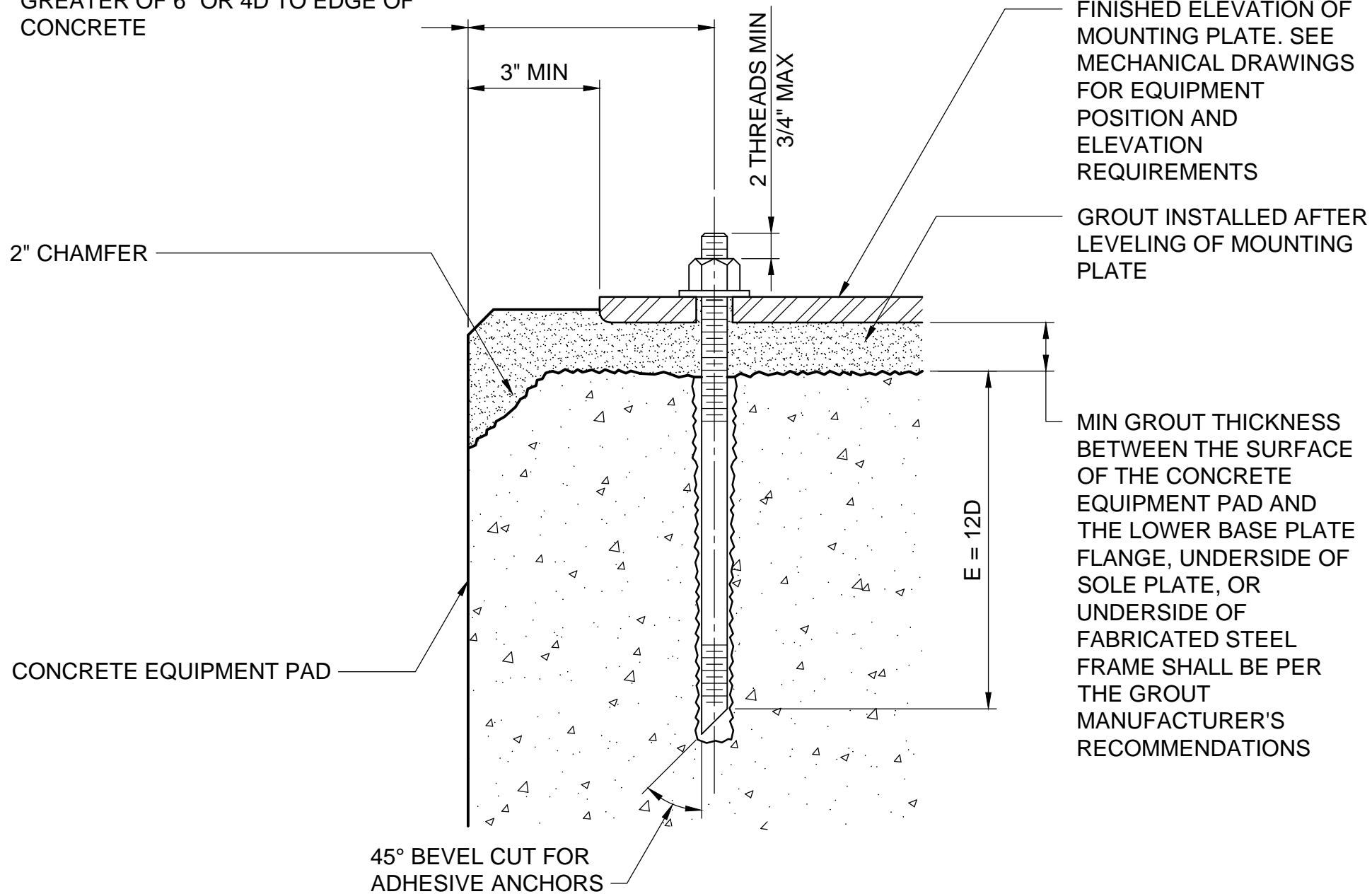
EQUIPMENT PAD

DETAIL

SCALE: NOT TO SCALE

C
M-03

MINIMUM EDGE DISTANCE EQUALS
GREATER OF 6" OR 4D TO EDGE OF
CONCRETE



ADHESIVE ANCHORS FOR RIGID EQUIPMENT MOUNTS

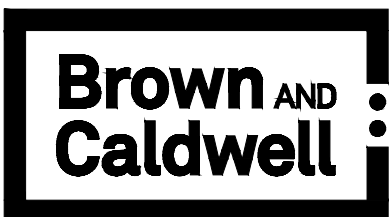
DETAIL

SCALE: NOT TO SCALE

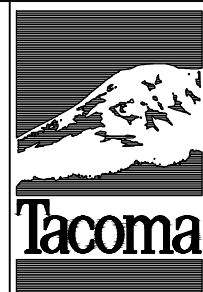
E
M-03

KEY NOTES:

- #4 @ 12" DOWELS FOR PADS 12" HIGH WITH 90 DEGREE STANDARD HOOK. PROVIDE 10" EMBEDMENT INTO STRUCTURAL SLAB.
- #4 @ 12" EACH WAY. TERMINATE WITH STANDARD HOOKS OR CLASS B LAP SPLICE WITH DOWEL HOOKS.
- #4 CLOSED TIES @ 8" WITH 135° END HOOKS OR U-SHAPED BARS WITH LAP SPLICES.
- ROUGHEN SLAB SURFACE TO 1/4" AMPLITUDE. REMOVE ALL LAITANCE AND LOOSE MATERIAL. APPLY BONDING AGENT 30 MINUTES OR LESS BEFORE PLACING CONCRETE. EXTENT OF ROUGHENED AREA SHALL BE 2 INCHES INSIDE THE PERIMETER OF THE EQUIPMENT PAD.
- AFTER THE CONCRETE IS FULLY CURED (28 DAYS), THE TOP OF THE EQUIPMENT PAD SHALL BE ROUGHENED. SEE NOTE 4.
- MINIMUM 1" CLEAR AFTER ROUGHENING TOP OF EQUIPMENT PAD.
- THE CONTRACTOR SHALL COORDINATE LOCATION OF ELECTRICAL CONDUIT AND DRAINAGE PIPING PENETRATIONS WITHIN THE EQUIPMENT PAD. ALL PENETRATIONS SHALL STUB-UP ON THE SAME SIDE OF THE EQUIPMENT AS REQUIRED FOR CONNECTION TO EQUIPMENT. EQUIPMENT PAD DRAINS SHALL BE LOCATED AT DRAINAGE CONNECTIONS FROM EQUIPMENT. EQUIPMENT PAD SHALL BE CONFIGURED ACCORDINGLY.
- EQUIPMENT PAD GROUT. MINIMUM THICKNESS PER GROUT MANUFACTURER'S INSTRUCTIONS.
- BASEPLATE, SOLEPLATE OR FABRICATED STEEL FRAME.
- 2-INCH ROUGHENED CHAMFER IN CONCRETE EQUIPMENT PAD ALL AROUND WHERE GROUT EXTENDS TO EDGE OF PAD.
- PRIOR TO CONCRETE PLACEMENT, EQUIPMENT ANCHORS SHALL BE ACCURATELY SET ACCORDING TO THE EQUIPMENT MANUFACTURER'S MOUNTING TEMPLATE AND FIRMLY SECURED TO PREVENT SHIFTING DURING CONCRETE PLACEMENT. SEE SECTION 43 11 19.13 FOR BLOWER PAD ADDITIONAL REQUIREMENTS.
- 3/4-INCH CHAMFER IN EQUIPMENT PAD GROUT ALL AROUND.



AT FULL SCALE
0 1/2 1
(IF NOT 1", SCALE
ACCORDINGLY)



NO

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DATE

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CHECKED

DATE
5/5/2021

SCALE

BY

DESIGNED
WBK

CHECKED
DJM

DATE

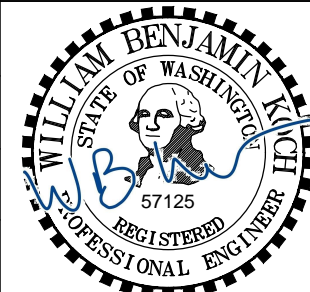
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WBK

PROJECT NAME

FIELD BOOKS

DRAWING NAME

152790 M-01



CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT

NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
MECHANICAL DETAILS - 1

DRAWING NO.

M-01

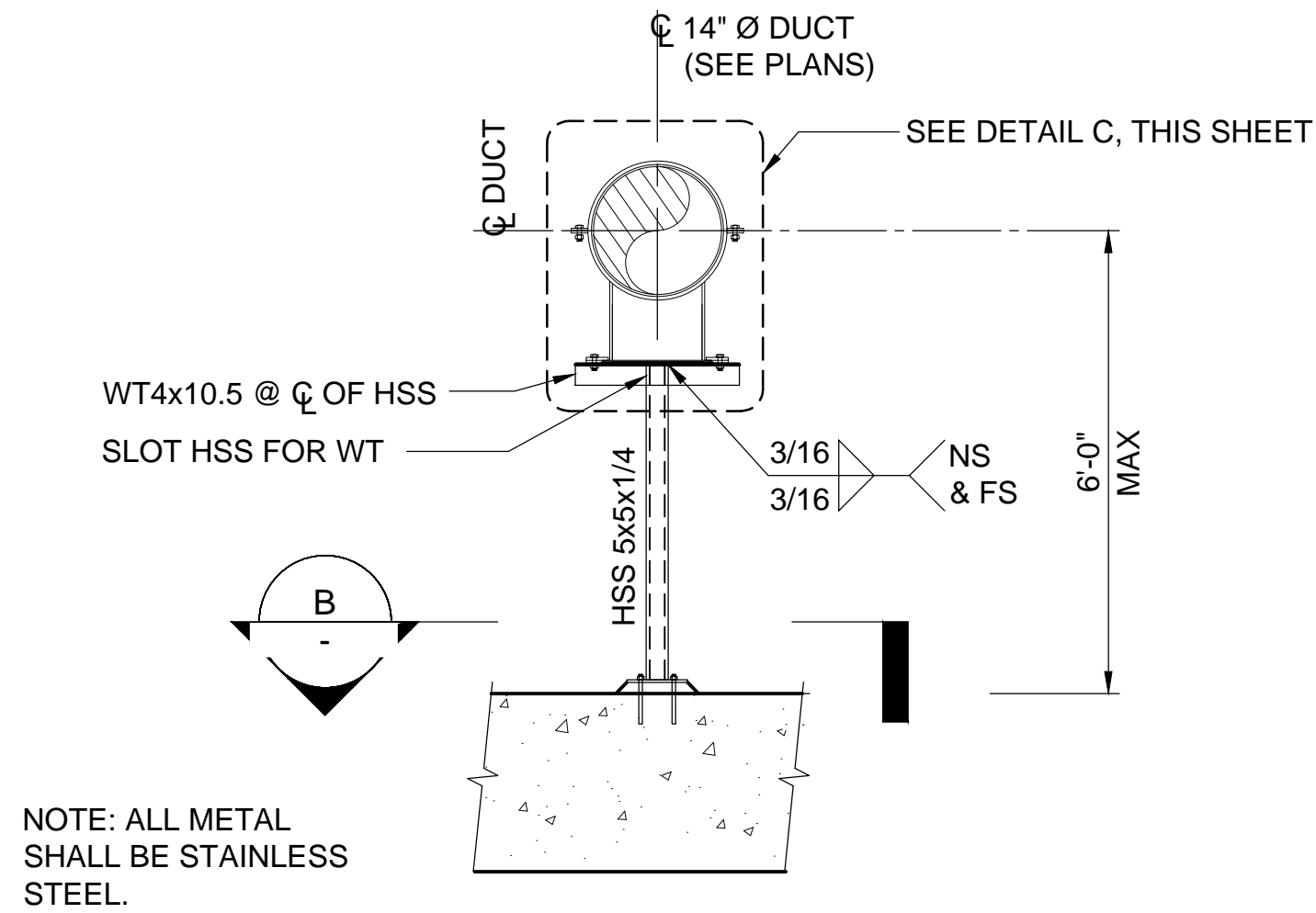
WBS NO.

ES22-0060F
ENV-04016-07

SHEET NO.

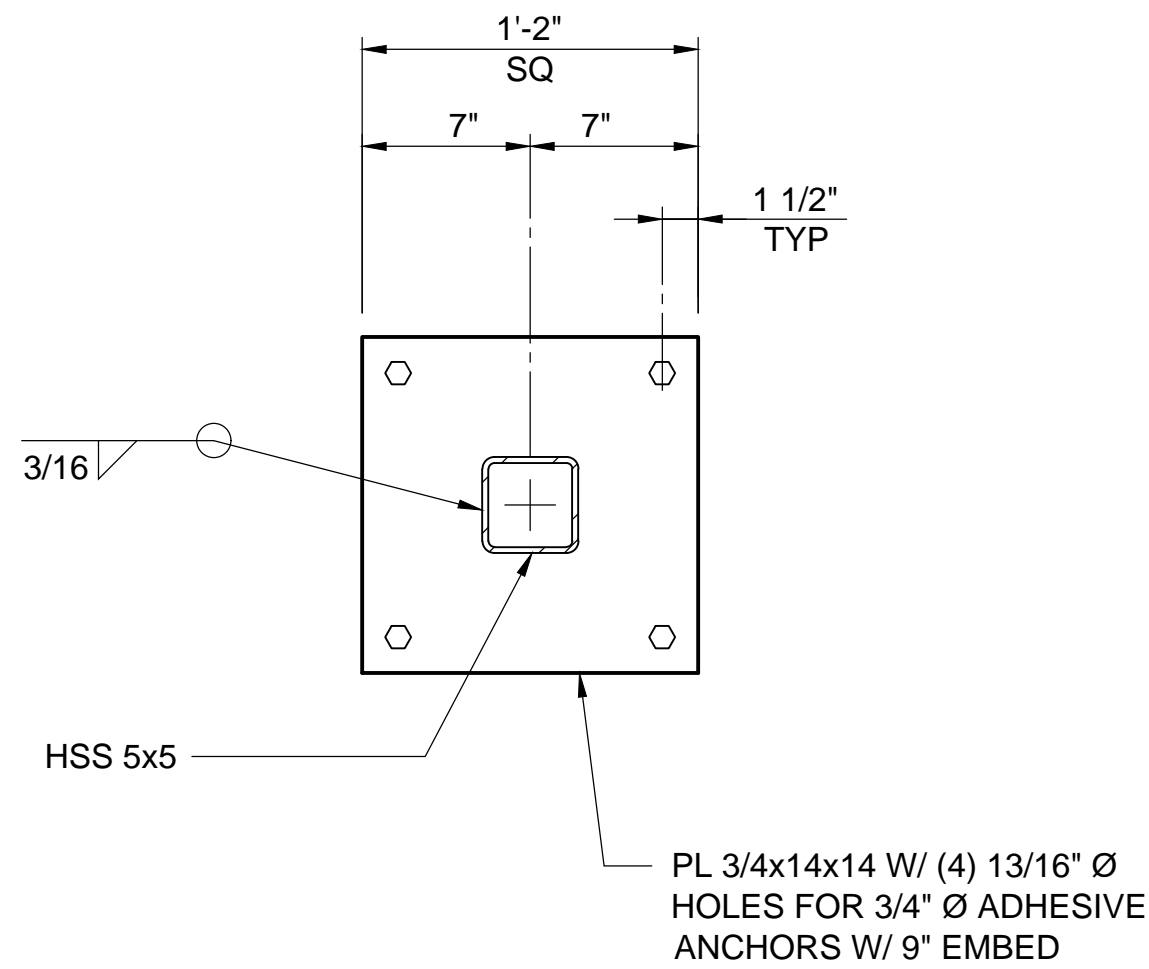
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OF 19



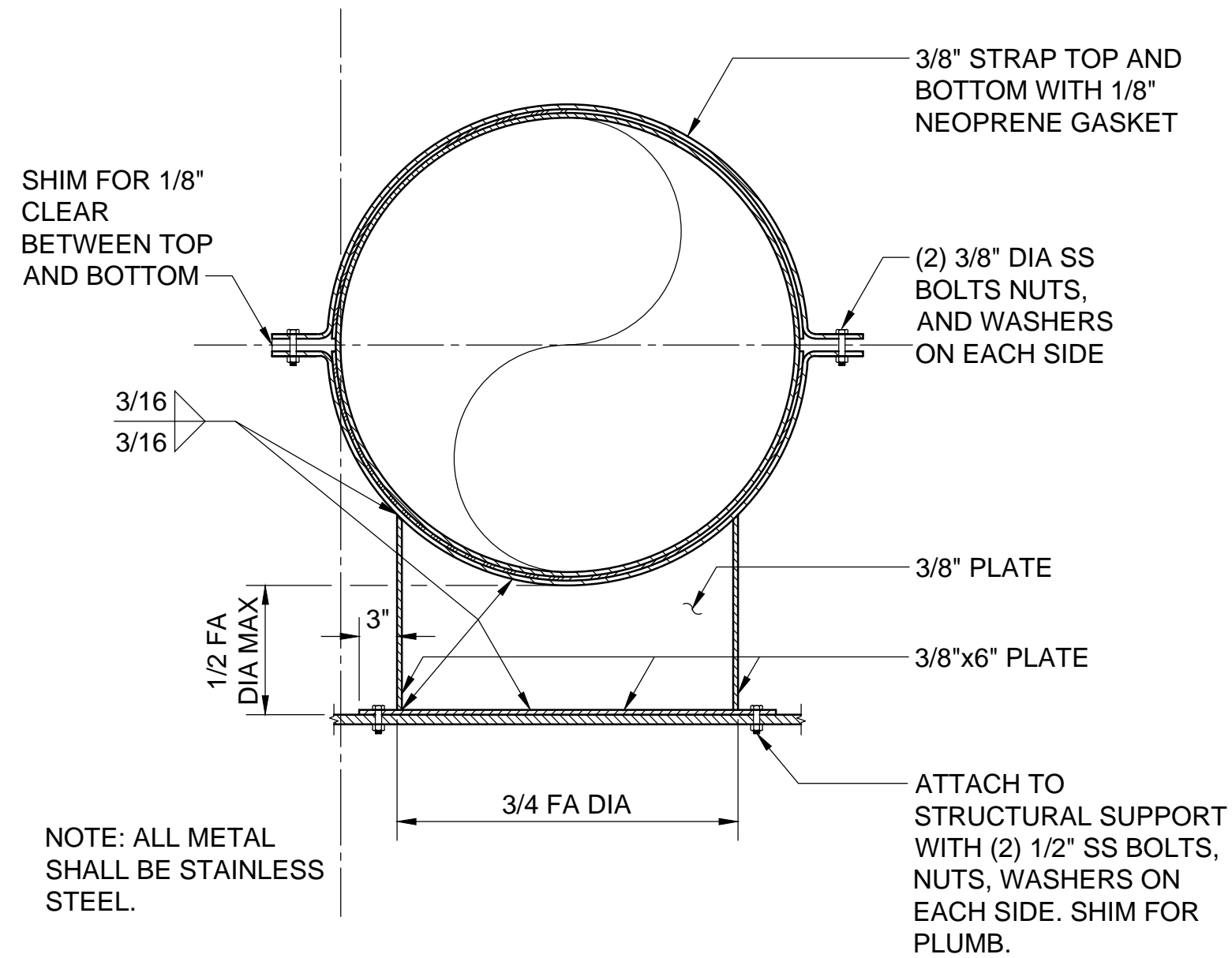
FOUL AIR DUCT SUPPORT

DETAIL A
SCALE: NOT TO SCALE
M-03



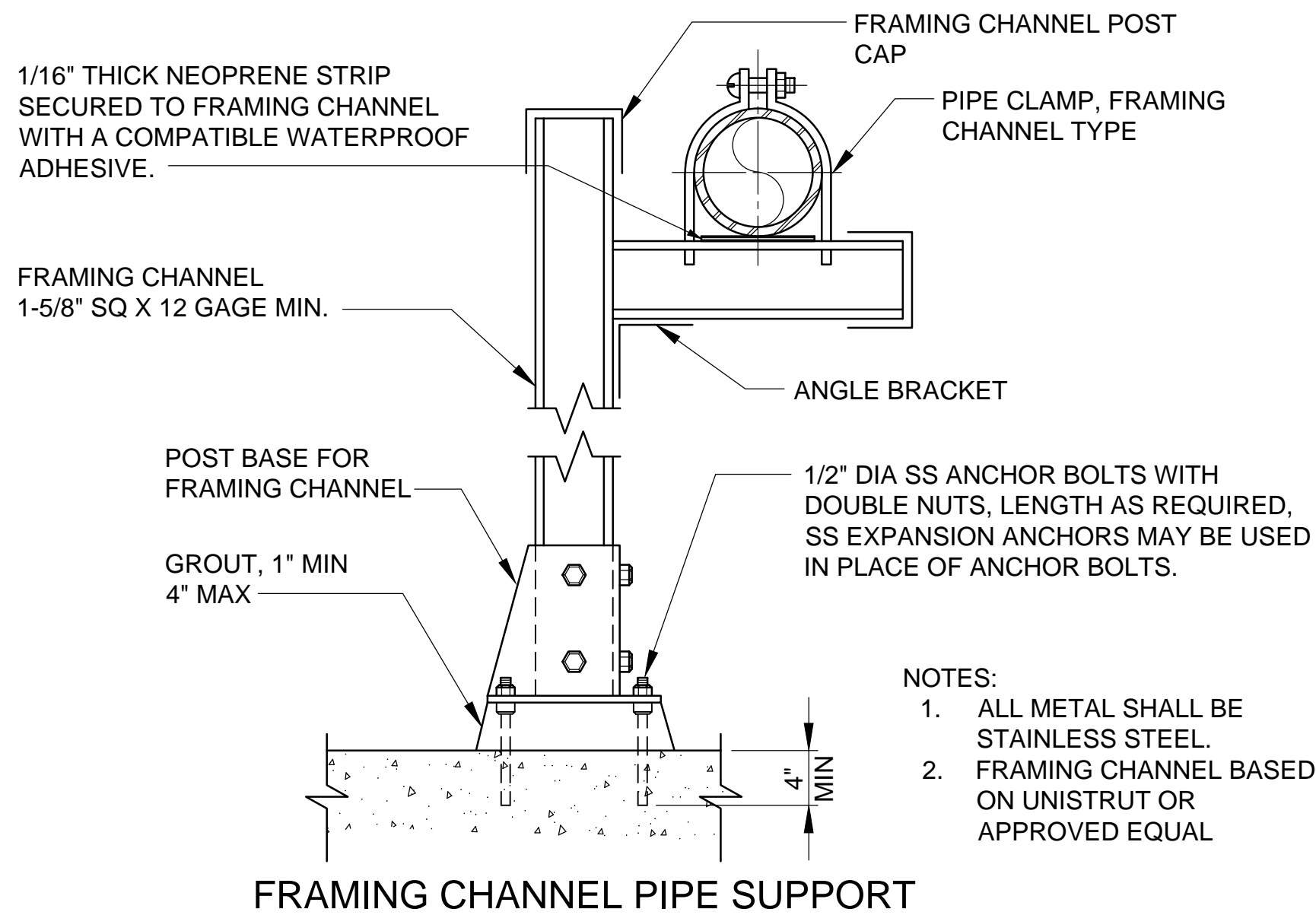
DUCT SUPPORT BASEPLATE

SECTION B
SCALE: NOT TO SCALE
M-03



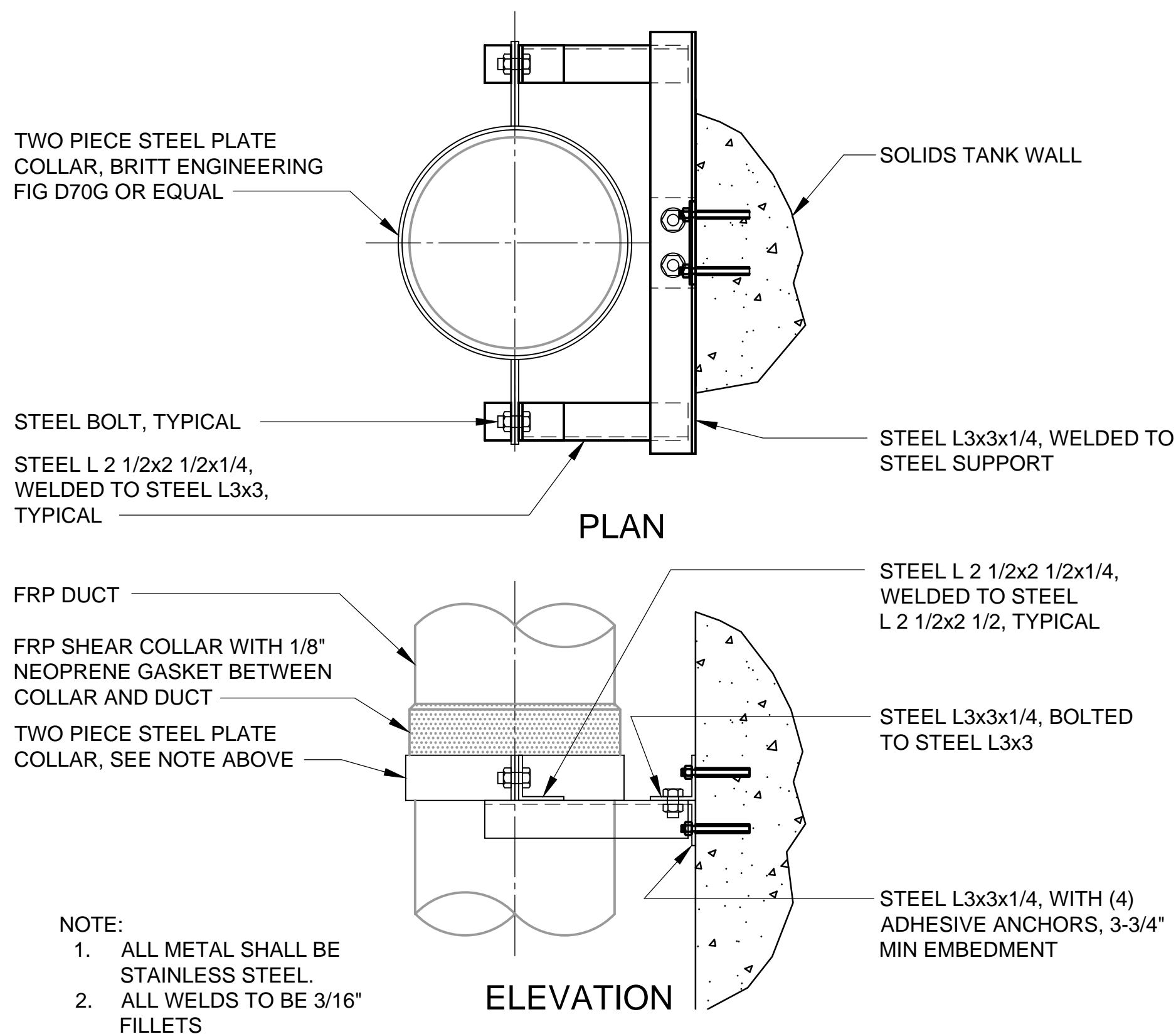
FOUL AIR DUCT SUPPORT

DETAIL C
SCALE: NOT TO SCALE
M-03



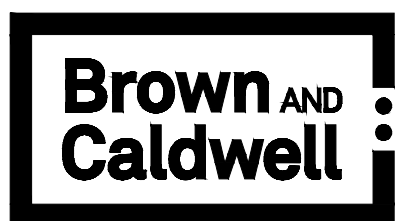
FRAMING CHANNEL PIPE SUPPORT

DETAIL D
SCALE: NOT TO SCALE
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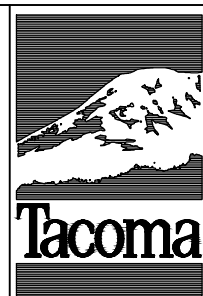


FOUL AIR DUCT SUPPORT

DETAIL E
SCALE: NOT TO SCALE
M-04



AT FULL SCALE
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(IF NOT 1", SCALE
ACCORDINGLY)



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FIELD BOOKS

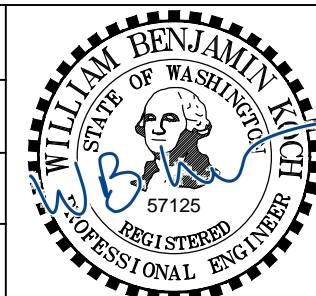
DATE
5/13/2022
DESIGNED
WBK
DRAWN
WBK
DRAWING NAME
152790 M-02

SCALE

CHECKED

DJM

PROJECT NAME



CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT
NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
MECHANICAL DETAILS - 2

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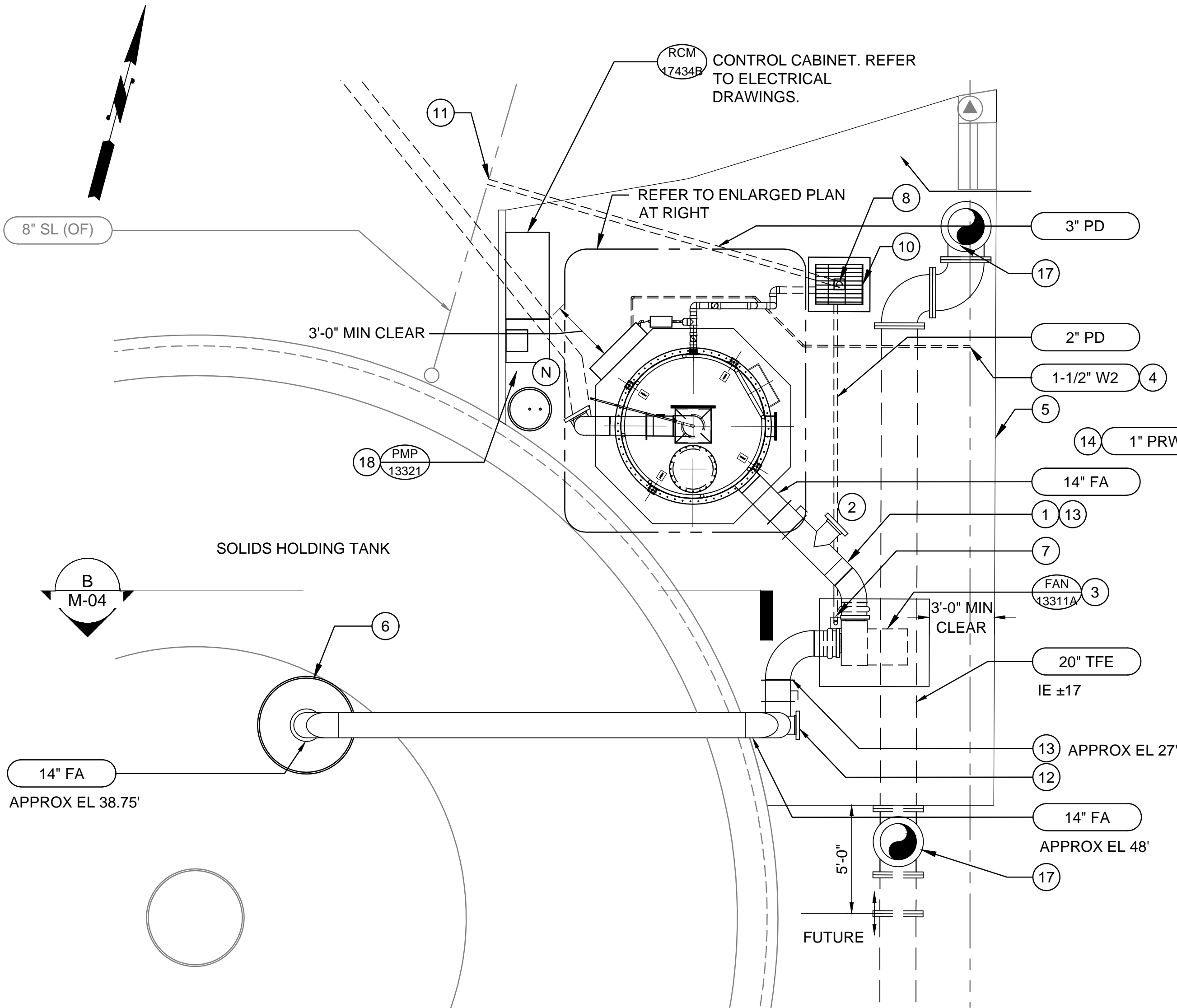
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WBS NO.

ES22-0060F
ENV-04016-07

SHEET NO.

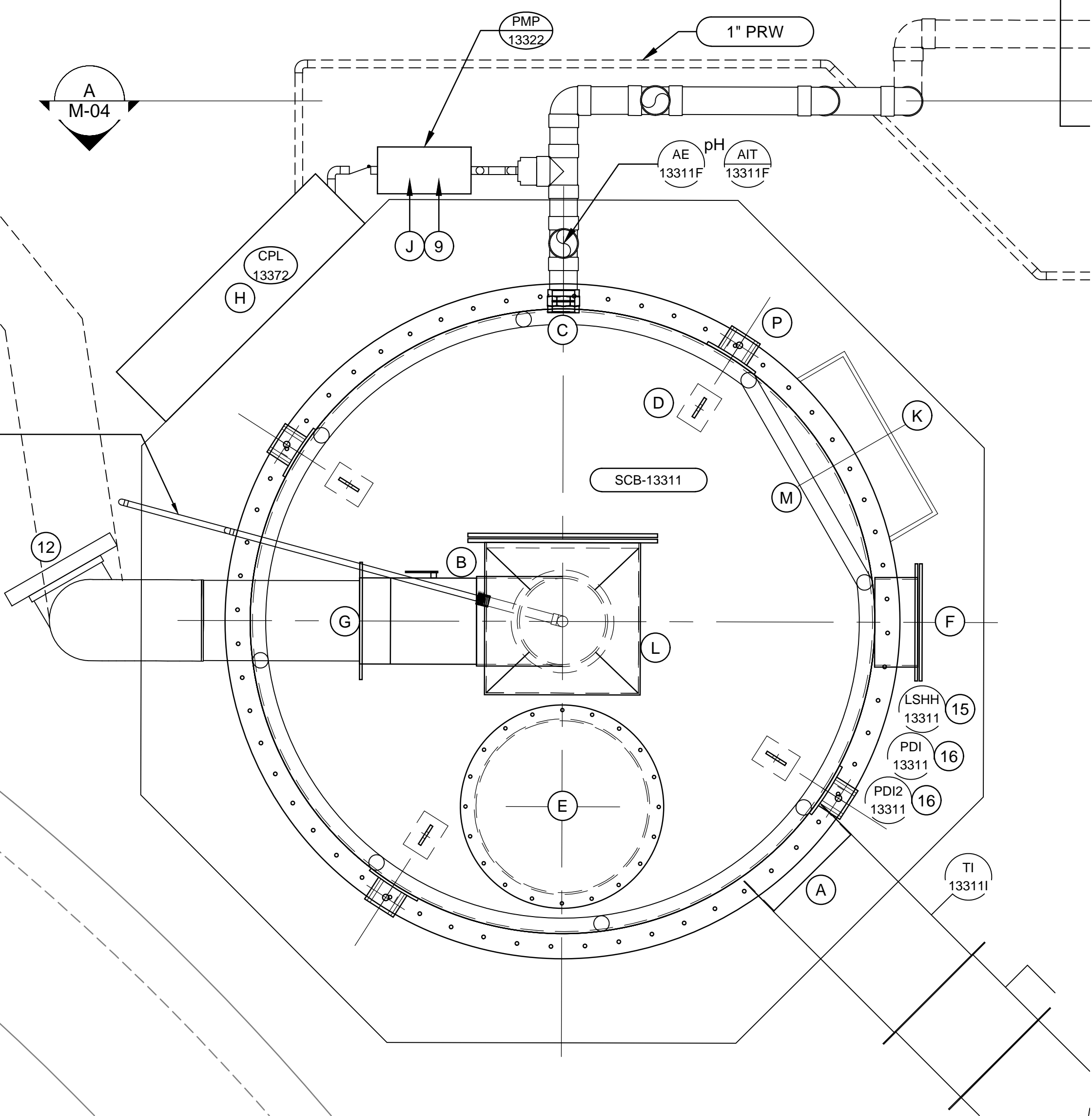
SHEET 15 OF 19



MECHANICAL
PLAN
SCALE: 1/4" = 1'-0"

BIOSCRUBBER APPURTENANCES

MARK	SIZE	DESCRIPTION
A	14"	AIR INLET
B	1"	IRRIGATION INLET
C	3"	DRAIN
D	--	LIFTING LUGS, TYP
E	24"	MANWAY W/ BLIND FLANGE
F	12"	SUMP INSPECTION PORT W/ BLIND FLANGE
G	10"	CONNECTION TO SECOND STAGE TREATMENT
H	--	IRRIGATION CONTROL PANEL
J	--	RECIRCULATION PUMP
K	--	LADDER
L	12"	MIST ELIMINATOR
M	--	HANDRAIL WITH SELF-CLOSING GATE
N	--	NUTRIENT TANK AND PUMP
P	--	ANCHOR LUGS, TYP



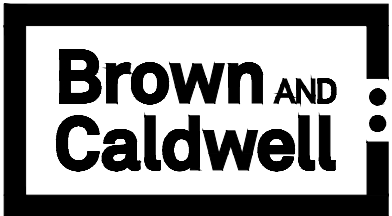
ODOR CONTROL BIOSCRUBBER
ENLARGED PLAN
SCALE: 1" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR SHALL PROTECT ALL UNDERGROUND UTILITIES.
2. ANY DAMAGE TO LANDSCAPE, UTILITIES, AND PAVEMENT SHALL BE REPLACED AT CONTRACTORS EXPENSE.
3. SLOPE PROCESS DRAIN (PD) PIPING AT 2% MINIMUM.

KEY NOTES:

- 1 PROVIDE 1" AIR SAMPLE PORT.
- 2 14" FRP TEE WITH BLIND FLANGE FOR BYPASS CONNECTION TO BYPASS (SEE NOTE 12) OR TEMPORARY STATIC ODOR CONTROL.
- 3 ODOR BLOWER. MOUNT ON VIBRATION ISOLATION BASE PER SPECIFICATION REQUIREMENTS. PROVIDE HOUSING DRAIN CONNECTION PER DETAIL B/M-01. PROVIDE EQUIPMENT PAD PER DETAILS C AND D/M-01.
- 4 CONNECT TO EXISTING 2" W2H DOWNSTREAM OF FREEZE PROOF HOSEBIBB. COORDINATE WITH OPERATORS TO SHUT OFF W2 SUPPLY, INSTALL NEW TEE AND PIPE TOWARDS BIOSCRUBBER IRRIGATION SYSTEM.
- 5 EXTENTS OF NEW CONCRETE SIDEWALK. REFER TO CIVIL DRAWINGS.
- 6 DEMOLISH EXISTING 4'-6" DIAMETER STEEL COVER AND GASKETING. REPLACE WITH NEW COVER AND GASKETING TO ACCOMMODATE 14" FOUL AIR CONNECTION.
- 7 TYPE II UN-TRAPPED DRAIN PER DETAIL A/M-01.
- 8 TYPE II DRAIN WITH P-TRAP PER DETAIL A/M-01.
- 9 INSTALL RECIRCULATION PUMP ON TANK EQUIPMENT PAD. SECURE WITH EPOXY ANCHORS PER MANUFACTURER'S RECOMMENDATIONS.
- 10 EPOXY LINED AREA DRAIN:
STRUCTURE: OLD CASTLE PRECAST TYPE 26 INLET OR EQUAL.
GRATING: FRP "CHEMGRATE" VE-25 RESIN OR EQUAL WITH 1-1/2" SQUARE GRID x 1-1/2" DEEP WITH ANTI-SKID SURFACE AND FIRE RESISTIVE RESIN. MUST BE 2-WAY GRATING, ONE WAY SPANNING GRATING WILL NOT BE ACCEPTED.
EPOXY LINING: COAT INTERIOR OF CATCH BASIN WITH BLENDED AMINE CURED EPOXY SUITABLE FOR LOW PH CONDITIONS. TNAMEC SERIES 434, CARBOLINE PLASITE 5371, OR EQUAL. PRIOR TO APPLICATION, FILL AIR VOIDS AND BUGHOLES IN CONCRETE WITH A SURFACER OR BLOCK FILLER. ADHERE TO COATING MANUFACTURER'S APPLICATION REQUIREMENTS, INCLUDING DRY FILM THICKNESS (DFT). GREY OR BEIGE COLOR
- 11 CONNECT 3" PD TO EXISTING 8" SL (OF) PER CIVIL DRAWINGS.
- 12 TEE WITH 10" BLIND FLANGE LOCATED WITH BOTTOM OF FLANGE 3'-0" ABOVE FINISHED GRADE FOR TEMPORARY BYPASSING OF SYSTEM.
- 13 DUCT SUPPORT PER DETAIL A/M-02.
- 14 MIST ELIMINATOR WASH PIPING. VALVES CONTAINED IN IRRIGATION CONTROL PANEL.
- 15 SUMP HIGH LEVEL SWITCH LOCATED ADJACENT TO INSPECTION PORT TO FACILITATE SWITCH MAINTENANCE.
- 16 REFER TO PROCESS DRAWING FOR CONNECTION LOCATION. MOUNT INDICATOR 4'-0" ABOVE SIDEWALK USING 316 SS STRUT RACK.
- 17 VERTICAL PIPE UP TO 1'-6" ABOVE FINISHED GRADE FOR FUTURE USE. PROVIDE BLIND FLANGE WITH 1" TAP, NIPPLE, AND BALL VALVE FOR AIR RELEASE.
- 18 MOUNT NUTRIENT PUMP 3'-0" ABOVE GRADE ON STAND PROVIDED BY BIOSCRUBBER MANUFACTURER.



AT FULL SCALE
0 1/2 1
(IF NOT 1", SCALE
ACCORDINGLY)



NO

REVISION

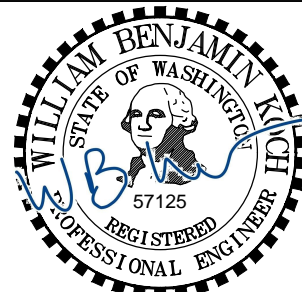
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FINAL
CONSTRUCTION
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FIELD BOOKS

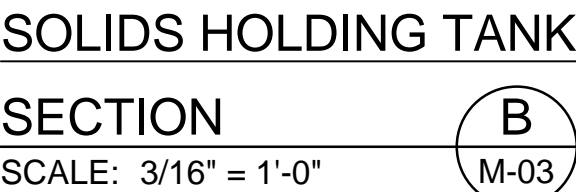
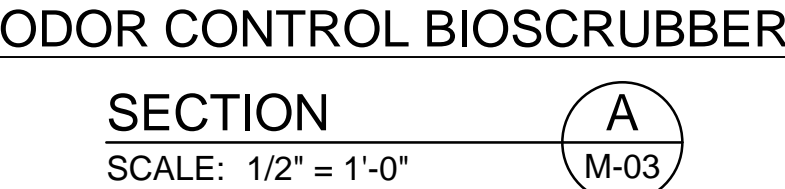
DATE
5/13/2022
DESIGNED
WBK
DRAWN
WBK
DRAWING NAME
152790 M-03

SCALE
AS NOTED
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PROJECT NAME



CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT
NORTH END WASTEWATER TREATMENT PLANT
ODOR CONTROL BIOSCRUBBER
MECHANICAL PLAN AND DETAIL

DRAWING NO.
M-03
WBS NO.
ES22-0060F
ENV-04016-07
SHEET NO.
SHEET 16 OF 19



- ① EXTENTS OF NEW CONCRETE SIDEWALK AND EQUIPMENT PAD SHOWN. REFER TO CIVIL AND STRUCTURAL DRAWINGS.
- ② TYPE II DRAIN WITH P-TRAP PER DETAIL A/M-01.
- ③ UTILIZE BURIED (STEEL) PIPE MATERIAL SPECIFIED ON G-01 UP TO 1' ABOVE GRADE, THEN TRANSITION TO EXPOSED (CPVC) MATERIAL.
- ④ SUPPORTS DESIGNED AND PROVIDED BY MANUFACTURER. SUPPORT INDEPENDENTLY OF ODOR CONTROL BIOSCRUBBER.
- ⑤ SUPPORT 10" DUCT FROM VESSEL. SUPPORT TO BE DESIGNED BY BIOSCRUBBER MANUFACTURER.
- ⑥ DEMOLISH EXISTING 4" FA PIPE. CUT AND CAP PIPE 2' ABOVE GRADE. INSTALL BLIND FLANGE ON 4" VALVE AT TOP OF SOLIDS TANK. DEMOLISH ALL SUPPORTS.
- ⑦ SUPPORT PIPE PER DETAIL D/M-02.
- ⑧ 10" BLIND FLANGE FOR SYSTEM BYPASS.
- ⑨ FOUL AIR DUCT SUPPORT PER DETAIL A/M-02.
- ⑩ FLEXIBLE COUPLING TO ALLOW FOR THERMAL EXPANSION OF DUCT.
- ⑪ PIPED P-TRAP DEPTH TO BE DETERMINED BY ODOR CONTROL BIOSCRUBBER EQUIPMENT MANUFACTURER. PROVIDE TEE WITH THREADED PLUG FOR CLEANOUT.
- ⑫ FOUL AIR DUCT SUPPORT PER DETAIL E/M-02.
- ⑬ DAMPER WITH BLADE SEAL PER SECTION 23 31 16.16.

PART VII

CITY OF TACOMA - LOCAL EMPLOYMENT AND APPRENTICESHIP TRAINING PROGRAM (LEAP) REGULATIONS FOR PUBLIC WORKS CONTRACTS



City of Tacoma
LEAP Office
747 Market Street, Room 900
Tacoma, WA 98402
(253) 591-5590 or leap@cityoftacoma.org

LEAP

Documents and Submittal Schedule

In the attached packet, you will find the LEAP forms that are required to be submitted by the Prime and Sub Contractors.

- ❑ **LEAP Abbreviated Program Requirements:** brief overview of LEAP Program requirements
- ❑ **Prime Contractor *LEAP* Utilization Plan:** to be submitted at the Pre-Construction Meeting
(Required by Prime Contractor Only)
- ❑ **LEAP Employee Verification Form:** to be submitted on an ongoing basis for each qualified LEAP employee
- ❑ **LEAP Weekly Payroll Report:** must be attached and filled out to the front of each certified payroll
- ❑ **Tacoma Public Utilities Service Area Map, Economically Distressed ZIP Codes Map:** for your reference on LEAP-qualified zoning areas

In addition, the City of Tacoma will also require from the Prime Contractor and all its Subcontractors:

- ❑ **Weekly Certified Payrolls:** to be submitted via LCP Tracker weekly, biweekly or monthly with the LEAP Payroll Report attached as scheduled by the Prime
- ❑ **Statement of Intent to Pay Prevailing Wages:** to be submitted prior to commencing work
- ❑ **Affidavit of Wages Paid:** to be submitted upon completion of each contractor's work
- ❑ **Document Verification:** provide required information when requested from LEAP Office

Please submit above documents as instructed by the LEAP Coordinator.

If you have any questions or request further information, please feel free to contact the City of Tacoma's LEAP Program at (253) 591-5590 or email dtrevorrow@cityoftacoma.org



City of Tacoma
Community and Economic Development Department
LEAP Office
747 Market Street, Room 900
Tacoma, WA 98402
(253) 591-5590
leap@cityoftacoma.org

LEAP LOCAL EMPLOYMENT AND APPRENTICESHIP TRAINING PROGRAM ABBREVIATED PROGRAM REQUIREMENTS

LEAP is a mandatory City of Tacoma program adopted to provide employment opportunities for City of Tacoma residents and residents of Economically Distressed Areas of the Tacoma Public Utilities Service Area. It requires Contractors performing qualifying public works projects or service contracts to ensure that 15 percent of the total labor hours worked on the project are performed by LEAP-Qualified Pierce County apprentices approved by the Washington State Apprenticeship Council (SAC), youth, veterans, residents of Tacoma, residents of surrounding Economically Distressed Areas, and/or TPU Service Areas. Compliance may be met through any combination LEAP-Qualified employees. The Prime Contractor shall be solely responsible for meeting the LEAP Utilization Goal requirements.

Prime Contractors may obtain further information by contacting the City of Tacoma's LEAP Coordinator, Deborah Trevorow, at (253) 591-5590, or e-mail leap@cityoftacoma.org. The LEAP Coordinator can assist contractors in the recruitment of qualified entry-level workers to work on City of Tacoma Public Works projects. The LEAP Office is in the Tacoma Municipal Building, 747 Market Street, Rm 900.

LEAP PROGRAM REQUIREMENTS:

1. **LOCAL EMPLOYMENT GOAL:** The Contractor is required to ensure that 15 percent of the total Labor Hours worked on the project are performed by residents of the City of Tacoma or Economically Distressed ZIP Codes for the following projects:

- a) Civil Projects over \$250,000
- b) Building Projects over \$750,000

2. **APPRENTICE GOAL:** The Contractor is required to ensure that 15 percent of the total Labor Hours worked on any project over \$1,000,000 are performed by Apprentices who are residents of the Tacoma Public Utilities Service Area. This is in addition to the Local Employment Goal.

3. **SUBCONTRACTOR NOTIFICATION:** Prime Contractors shall notify all Subcontractors of the LEAP Program requirement. Subcontractor labor hours may be utilized towards achievement of the LUG. Owner/Operator hours may be used for the Local Employment Goal.

4. **FAILURE TO MEET LEAP UTILIZATION GOAL:** Contractors shall be assessed an amount for each hour that is not achieved. The amount per hour shall be based on the extent the Contractor met its goal. The amount per hour that shall be assessed shall be as follows:

- 100% achievement \$0.00 penalty
- 99% to 90% achievement \$2.00 penalty
- 89% to 75% achievement \$3.50 penalty
- 74% to 50% achievement \$5.00 penalty
- 49% to 1% achievement \$7.50 penalty
- 0% achievement \$10.00 penalty

*Penalty may be waived in the best interests of the City of Tacoma.

LEAP DOCUMENT SUBMITTALS:**

1. *PRIME CONTRACTOR LEAP UTILIZATION PLAN (PCLUP)*: The Contractor is required to provide the *PCLUP* at the **Pre-Construction meeting** showing the goals to be achieved for the project. The Contractor must identify in the *PCLUP* the estimated labor hours to be worked on the project by trade/craft persons.
2. *LEAP EMPLOYEE VERIFICATION FORM*: The Contractor must provide the LEAP Office with a form for every person whom the contractor thinks will assist with attaining credit towards meeting the LUG with at least one piece of verifying documentation. The LEAP Office staff will respond regarding whether or not the employee is LEAP-Qualified.
3. *LEAP WEEKLY PAYROLL REPORT*: The Prime and Subcontractors must complete and attach this form to the front of each weekly certified payroll when submitting payrolls in LCP Tracker
4. *WEEKLY CERTIFIED PAYROLL*: The Prime and Subcontractors must submit weekly Certified Payrolls that include, employee name, address, social security number, craft/trade, class, hours worked on this job, rate of pay, and gross wages paid including benefits for this job.
5. *DEPARTMENT OF LABOR & INDUSTRIES (L&I)*: The Prime must enter the project in the L&I project site and notify the LEAP Office when this has been completed.

****WITHHOLDING PROGRESS PAYMENTS:** The LEAP Coordinator may withhold progress payments for failure to follow the above-outlined procedures

CHAPTER 1.90
LOCAL EMPLOYMENT AND APPRENTICESHIP TRAINING PROGRAM

Sections:

- 1.90.010 Purpose.
- 1.90.020 Scope.
- 1.90.030 Definitions.
- 1.90.040 LEAP goals.
- 1.90.050 *Repealed.*
- 1.90.060 Effect of program on prime contractor/subcontractor relationship.
- 1.90.070 Apprentice utilization requirements – Bidding and contractual documents.
- 1.90.080 Enforcement.
- 1.90.090 Compliance with applicable law.
- 1.90.100 Review and reporting.
- 1.90.105 Authority
- 1.90.110 Interpretation.

1.90.010 Purpose.

The purpose of this Chapter is to establish a means of providing for the development of a trained and capable workforce possessing the skills necessary to fully participate in the construction trades.

(Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.020 Scope.

The provisions of this Chapter shall apply to all Public Works or Improvements funded in whole or in part with City funds or funds which the City expends or administers in accordance with the terms of a grant.

(Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.030 Definitions.

As used in this chapter, the following terms shall have the following meanings:

- A. “Apprentice” shall mean a person enrolled in a course of training specific to a particular construction trade or craft, which training shall be approved by the Washington State Apprenticeship and Training Council established pursuant to RCW 49.04.010.
- B. “Building Projects” shall mean all Public Works or Improvements having an Estimated Cost greater than \$750,000.00, and for which a building permit must be issued pursuant to Chapter 1 of the current edition of the state building code (Uniform Building Code).
- C. “City” shall mean all divisions and departments of the City of Tacoma, and all affiliated agencies, provided, however, that the Tacoma Community Redevelopment Authority shall not be included within this definition.
- D. “Civil Projects” shall mean all Public Works or Improvements that are not defined as a “Building Project,” provided that those projects having an Estimated Cost of less than \$250,000.00 shall not be included in this definition.
- E. “Contractor or Service Provider” means a person, corporation, partnership, or joint venture entering into a contract with the City to construct a Public Work or Improvement.
- F. “Director” shall mean the Director of Community and Economic Development, or the Director’s Designee.
- G. “Economically Distressed ZIP Codes” shall mean ZIP codes in the Tacoma Public Utilities Service Area that meet two out of three (2/3) of the thresholds of:

1. High concentrations of residents living under 200% of the federal poverty line in terms of persons per acre (69th percentile)
2. High concentrations of unemployed people in terms of persons per acre (45th percentile)
3. High concentrations of people 25 years or older without a college degree in terms of persons per acre (75th percentile)

Said thresholds shall be updated within 30 days following any Prevailing Wage updates issued by the Washington State Labor and Industry. All updates are to be published on the first business day in August and in February of each calendar year.

H. “Electrical Utility” and “Water Utility” shall mean, respectively, the Light Division of the Department of Public Utilities of the City of Tacoma, and shall include the electrical and telecommunications services of that Division, and the Water Division of the Department of Public Utilities of the City of Tacoma.

I. “Estimated Cost” shall mean the anticipated cost of a Public Work or Improvement, as determined by the City, based upon the expected costs of materials, supplies, equipment, and labor, but excluding taxes and contingency funds.

J. “Estimated Labor Hours” shall mean the anticipated number of Labor Hours determined by the City to be necessary to construct a Public Work or Improvement and set forth in the specifications for the project, or as may be subsequently revised due to contract or project adjustment, or pursuant to an agreed upon change order.

K. “Existing Employee” shall mean an employee whom the Contractor or Service Provider can demonstrate was actively employed by the Contractor or Service Provider for at least 1000 hours in the calendar year prior to bid opening plus one month following bid opening, and who was performing work in the construction trades.

L. “Labor Hours” shall mean the actual number of hours worked by workers receiving an hourly wage who are employed on the site of a Public Work or Improvement, and who are subject to state or federal prevailing wage requirements. The term “Labor Hours” shall include hours performed by workers employed by the Contractor or Service Provider and all Subcontractors, and shall include additional hours worked as a result of a contract or project adjustment or pursuant to an agreed upon change order. The term “Labor Hours” shall not include hours worked by workers who are not subject to the prevailing wage requirements set forth in either RCW 39.12 or the Davis-Bacon Act - 40 U.S.C. 276 (a).

M. “LEAP Coordinator” shall mean the City of Tacoma staff member who administers LEAP.

N. “LEAP Program” or “Program” shall mean the City of Tacoma’s Local Employment and Apprenticeship Training Program, as described in this chapter.

O. “LEAP Regulations” or “Regulations” shall mean the rules and practices established in this document.

P. “LEAP Utilization Plan” shall mean the document submitted by the Contractor to the LEAP Coordinator which outlines how the associated goals will be met on the project.

Q. “Priority Hire Resident” shall mean any resident within the Economically Distressed ZIP Codes.

R. “Project Engineer” shall mean the City employee who directly supervises the engineering or administration of a particular construction project subject to this chapter.

S. “Public Work or Improvement” shall have the same meaning as provided in Section 39.04.010 RCW, as that Section may now exist or hereafter be amended.

T. “Resident of Tacoma” shall mean any person, not defined as a Resident of the Community Empowerment Zone, who continues to occupy a dwelling within the boundaries of the City of Tacoma, has a present intent to continue residency within the boundaries of the City, and who demonstrates the genuineness of that intent by producing evidence that the person’s presence is more than merely transitory in nature.

U. “Service Area - Electrical” or “Electrical Service Area” shall mean that area served with retail sales by the Electrical Utility of the City of Tacoma at the time a bid is published by the Electrical Utility for a Public Work or Improvement to be performed primarily for the Electrical Utility.

V. “Service Area - Water” or “Water Service Area” shall mean that area served with retail sales by the water utility of the City of Tacoma at the time a bid is published by the water utility for a Public Work or Improvement to be performed primarily for the water utility.

W. “Service Contract” shall mean all City contracts relating to a Public Work or Improvement which utilize labor at a City site and which are not within the exceptions to nor defined as “Building Projects” or “Civil Projects.”

X. “Subcontractor” means a person, corporation, partnership, or joint venture that has contracted with the Contractor or Service Provider to perform all or part of the work to construct a Public Work or Improvement by a Contractor.

Y. “Tacoma Public Utilities” means the City of Tacoma, Department of Public Utilities.

Z. “Tacoma Public Utilities Service Area” shall mean every ZIP code listed by Tacoma Public Utilities as an area that either receives services or maintains infrastructure to provide services.

AA. Washington State Labor and Industry Prevailing Wage shall mean the hourly wage, usual benefits and overtime, paid in the largest city in each county, to the majority of workers, laborers, and mechanics. Prevailing wages are established, by the Department of Labor & Industries, for each trade and occupation employed in the performance of public work. They are established separately for each county, and are reflective of local wage conditions.

(Ord. 28520 Ex. A; passed Jul. 17, 2018; Ord. 28147 Ex. B; passed May 7, 2013; Ord. 28110 Ex. C; passed Dec. 4, 2012; Ord. 27815 Ex. A; passed Jun. 30, 2009; Ord. 27368 § 1; passed Jun. 21, 2005; Ord. 26698 § 1; passed Sept. 12, 2000; Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.040 LEAP goals.

A. Utilization Goals.

1. All Contractors constructing Civil Projects or Building Projects, and all Service Providers involved with the construction of a Public Work or Improvement, shall ensure that at least 15 percent of the total Labor Hours actually worked on the Project are performed by persons having their residence within the boundaries of the City of Tacoma or Economically Distressed ZIP Codes, whether or not any such person is an Apprentice.

a. The thresholds for this section shall be \$250,000.00 for Civil Projects and \$750,000.00 for Building Projects.

2. Fifteen percent (15%) of the Total Labor Hours on contracts above one-million dollars (\$1,000,000.00) shall have work performed by Apprentices who are residents of the Tacoma Public Utilities Service Area consistent with RCW 39.04.320(1)(a), subject to waiver based on exceptions as specified in RCW 39.04.320(2)(a), (b), and (c).

3. Labor Hours performed by non-residents of the State of Washington will be deducted from a project's total Labor Hours for purposes of determining compliance with the requirements of this chapter.

4. All Contractors and Service Providers shall submit a LEAP Utilization Plan as provided for in the regulations adopted under this chapter, and shall meet with the LEAP Coordinator to review said Plan prior to being issued a Notice to Proceed. Failure to submit a LEAP Utilization Plan may be grounds for the City to withhold remittance of a progress payment until such Plan is received from the responsible Contractor or Provider. A meeting with the LEAP Coordinator prior to issuance of a Notice to Proceed shall be excused only when the LEAP Coordinator is unavailable to meet prior to the scheduled date for issuance of the Notice to Proceed and the Contractor and the LEAP Coordinator have otherwise scheduled a meeting for the coordinator to review the Contractor's or Provider's plan.

The Contractor or Service Provider shall be responsible for meeting the LEAP utilization goal requirements of the contract, including all amendments and change orders thereto, and shall be responsible for overall compliance for all hours worked by Subcontractors. To the extent possible, the Contractor or Service Provider shall recruit Apprentices from multiple trades or crafts.

B. Failure to Meet Utilization Goal.

1. Contracts for the construction of Building projects or Civil projects and Service Contracts shall provide that Contractors or Service Providers failing to meet the LEAP utilization goals shall be assessed an amount for each hour that is not achieved. The amount per hour shall be based on the extent the Contractor or Service Provider met its goal. The amount per hour that shall be assessed shall be as follows:

Percent of Goal Met	Assessment per unmet hour
100%	\$ 0.00
90% - 99%	\$ 2.00
75% to 89%	\$ 3.50
50% to 74%	\$ 5.00
1% to 49%	\$ 7.50
0%	\$10.00

When determining the percent of goal that is met, all rounding shall be down to the nearest whole percent. No penalty shall be waived by the City unless it is determined by the Director to be in the best interests of the City, which determination shall be made after consultation with the LEAP Coordinator.

2. Deposit of Assessments. All assessments imposed pursuant to this section shall be deposited into a separate account and utilized to support the City's pre-apprenticeship and training program. The policies and regulations adopted by the City Manager and Director of Utilities pursuant to this chapter shall address issues pertaining to a Contractor's existing workforce. Contributions need not be made for Labor Hours that have been adjusted in accordance with Section 1.90.040(E).

C. LEAP Reports.

Notwithstanding the provisions of TMC 1.90.100, the Director shall, not less than annually, publish a LEAP report setting forth Contractor compliance with this chapter. Said report shall include information on all contracts and all Contractors to which this chapter applies, and shall detail the level and nature of LEAP participation by contract and by Contractor, The

Director's LEAP report may include such other information as may be helpful to assuring fair and accurate representation of the contracts, Contractors or projects covered in the report. The Director's LEAP reports may be considered by the Board of Contracts and Awards in its determinations as to bidder responsibility.

D. LEAP Goal Adjustments.

1. LEAP utilization goals may be adjusted prior to bid opening and/or as a result of a contract amendment or change order on a Building Project, Civil Project, or Service Contract.

a. If LEAP utilization goals are adjusted prior to bid opening, they shall be set forth in the bid or Request For Proposal advertisement and specification documents or in an addendum timely provided to prospective bidders, provided that such adjustment shall be based upon a finding by the Project Engineer that the reasonable and necessary requirements of the contract render LEAP utilization unfeasible at the required levels. The Director shall concur with the Project Engineer's finding, provided that should the Project Engineer and the Director fail to reach agreement on the Project Engineer's finding, then in that circumstance the matter shall be referred to the City Manager or the Director of Utilities, as appropriate, for ultimate resolution. Notwithstanding any other provision of this chapter to the contrary, the decision of the City Manager or the Director of Utilities with regard to LEAP goal adjustment may not be appealed.

b. If LEAP utilization goals are adjusted due to contract amendment or change order, the amount of adjustment shall be consistent with the utilization goals set forth in this chapter and shall be determined pursuant to regulations adopted pursuant to this chapter for administration of LEAP utilization goal adjustments.

2. The methodology of determining the appropriate adjustments to LEAP utilization goals shall be determined in consultation with the LEAP Advisory Committee, established pursuant to this ordinance for so long as the LEAP Advisory Committee remains in existence.

3. LEAP utilization goals shall not apply to those portions of a project that are funded by sources other than (a) City funds, or (b) funds which the City expends or administers in accordance with the terms of a grant to the City, provided that the Project Engineer shall notify the Director of such non-application prior to bid advertisement. For the purposes of this paragraph, credits extended by another entity for the purpose of providing project funding shall not be considered to be City funds.

E. Utilization - Electrical Projects Outside Electrical Service Area.

Civil Projects or Building Projects that are constructed primarily for the benefit or use by the City's Electrical Utility, which are wholly situated outside the Electrical Service Area, and for which the estimated cost is less than \$1,000,000.00, are exempt from the requirements of this chapter.

F. Utilization - Water Projects Outside Water Service Area.

Civil Projects or Building Projects that are constructed primarily for the benefit or use by the City's water utility, which are wholly situated outside the Water Service Area, and for which the estimated cost is less than \$1,000,000.00 are exempt from the requirements of this chapter.

G. Utilization - Projects Outside Tacoma Public Utilities Service Area.

Civil Projects or Building Projects that are constructed primarily for the benefit or use by Tacoma Public Utilities, which are wholly situated outside the retail service area of the Tacoma Public Utilities Service Area, and for which the estimated cost is less than \$1,000,000.00 are exempt from the requirements of this chapter. Projects wholly situated outside the Tacoma Public Utilities Service Area, and for which the estimated cost is more than \$1,000,000.00, shall be exempt from 15% utilization goal specified in subsection A1. of this section. The 15% utilization goal specified in subsection A2. of this section may be met if project work is performed by Apprentices who are enrolled in a course of training specific to a particular construction trade or craft, provided such training has been approved by the Washington State Apprenticeship and Training Council in accordance with Chapter 49.04, RCW.

H. Emergency.

This chapter shall not apply in the event of an Emergency. For the purposes of this section, an "Emergency" means unforeseen circumstances beyond the control of the City that either: (a) present a real, immediate threat to the proper performance of essential functions; or (b) will likely result in material loss or damage to property, bodily injury, or loss of life if immediate action is not taken.

I. Conflict with State or Federal Requirements.

If any part of this chapter is found to be in conflict with federal or state requirements which are a prescribed condition to the allocation of federal or state funds to the City, then the conflicting part of this chapter is inoperative solely to the extent of the conflict and with respect to the City departments directly affected. This provision does not affect the operation of the

remainder of this chapter. Administrative rules or regulations adopted under this chapter shall meet federal and state requirements which are a necessary condition to the receipt of federal or state funds by the City.

(Ord. 28520 Ex. A; passed Jul. 17, 2018; Ord. 28147 Ex. B; passed May 7, 2013; Ord. 27815 Ex. A; passed Jun. 30, 2009; Ord. 27368 § 2; passed Jun. 21, 2005; Ord. 26992 § 1; passed Oct. 15, 2002; Ord. 26698 § 2; passed Sept. 12, 2000; Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.050 Repealed by Ord. 27368. Good faith efforts.

(Ord. 27368 § 3; passed Jun. 21, 2005; Ord. 26698 § 3; passed Sept. 12, 2000; Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.060 Effect of program on prime contractor/service provider - subcontractor relationship.

The LEAP Program shall not be construed so as to modify or interfere with any relationship between any Contractor or Service Provider and Subcontractor. The LEAP Program shall not grant the City any authority to control the manner or method of accomplishing any construction work that is additional to any authority retained by the City in a Public Works contract.

(Ord. 26698 § 4; passed Sept. 12, 2000; Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.070 Apprentice utilization requirements – Bidding and contractual documents.

All packages of bid documents for every Building Project and every Civil Project shall incorporate provisions satisfactory to the City Attorney so as to allow enforcement of the provisions contained in this Chapter. Such contractual provisions may include liquidated damages, calculated to reimburse the City for the Contractor's breach of these performance requirements, which shall be published with the City's call for bids.

(Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.080 Enforcement.

A. The Director shall review the Contractor's or Service Provider's and all Subcontractor's employment practices during the performance of the work for compliance with LEAP Program requirements. On-site visits may be conducted as necessary to verify compliance with the requirements of the LEAP Program. The Contractor, Service Provider, or Subcontractors shall not deny to the City the right to interview its employees, provided that the Director shall make reasonable efforts to coordinate employee interviews with employers.

B. Any knowing failure or refusal to cooperate in compliance monitoring may disqualify the defaulting Contractor, Service Provider, or Subcontractor from eligibility for other City contracts.

C. The making of any material misrepresentation may disqualify the defaulting Contractor, Service Provider, or Subcontractor from eligibility for other City contracts.

D. Any action by the City, its officers and employees, under the provisions of this Chapter may be reviewed by the Board of Contracts and Awards, upon written application of the party so affected. Application shall be made within twenty (20) days of the date of the action upon which the appeal is based, and provided to the City by certified mail or by personal service. Any action taken by the Board of Contracts and Awards may be appealed to the City Council or Public Utility Board, as appropriate, and thereafter if desired, to the Superior Court of Pierce County, Washington, within fifteen (15) days of the previous decision.

(Ord. 26698 § 5; passed Sept. 12, 2000; Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.090 Compliance with applicable law.

Nothing in this Chapter shall excuse a Prime Contractor, Service Provider, or Subcontractor from complying with all relevant federal, state, and local laws.

(Ord. 26698 § 6; passed Sept. 12, 2000; Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.100 Review and reporting.

The City Manager and Director of Utilities shall review the Program on or before January 1, 2000, and every two (2) years thereafter, and shall report to the City Council and Public Utility Board the Manager's and Director's findings, conclusions, and recommendations as to the continued need for the Program, and any revisions thereto that should be considered by the Council and Board.

(Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.105 Authority.

The City Manager and the Director of Utilities shall have authority to jointly adopt policies and regulations consistent with this chapter to implement the LEAP program.

(Ord. 26698 § 7; passed Sept. 12, 2000: Ord. 26301 § 1; passed Oct. 6, 1998)

1.90.110 Interpretation.

This Chapter shall not be interpreted or construed so as to conflict with any state or federal law, nor shall this Chapter be enforced such that enforcement results in the violation of any applicable judicial order.

(Ord. 26301 § 1; passed Oct. 6, 1998)

LOCAL EMPLOYMENT AND APPRENTICESHIP TRAINING PROGRAM (LEAP)

LEAP REQUIREMENTS & PROCEDURES:

The LEAP office enforces post-award mandatory requirements. Bidders do not have to submit any information in the bid submittal package to be in compliance with LEAP.

Post-award Submittals:

- *Prime Contractor LEAP Utilization Plan.* This form is to be completed and presented at the Pre-Construction Meeting.
- *LEAP Employee Verification Form.* This form is to be completed for every qualifying LEAP employee.
- *LEAP Weekly Payroll Report.* This form is to be completed and submitted with each certified payroll.

The City of Tacoma's LEAP office enforces two mandatory requirements on City projects based on certain monetary thresholds.

Local Employment Utilization Goal - the Prime Contractor performing a qualifying public works project must ensure that 15 percent of the total labor hours worked on the project are performed by residents of the City of Tacoma or Economically Distressed Zip Codes whether or not any such person is an apprentice.

Apprenticeship Utilization Goal – for contracts above one-million dollars, the Prime Contractor performing a qualifying public works project must ensure that 15 percent of the total labor hours worked on the project are performed by Apprentices who are residents of the City of Tacoma or Tacoma Public Utilities Service Area. The accompanying LEAP Regulations, forms, and maps are included in these specifications.

***Exceptions:** If the project is located outside of the retail service area of the Tacoma Public Utilities Service Area, then Apprentices may come from the county in which the work is performed.

This project is above \$1 million and is thusly subject to the:

1. 15% Local Employment Utilization Goal
2. 15% Apprentice Utilization Goal

LEAP staff can assist contractors in the recruitment, screening and selection of qualified City of Tacoma residents, Economically Distressed Area residents, and Apprentices. Contractors may obtain further information by contacting the City's LEAP Office at (253) 316-3057 or (253) 591-5590. The LEAP Office is located in the Tacoma Municipal Building, 747 Market Street, Room 900, Tacoma, WA 98402. www.cityoftacoma.org/leap



City of Tacoma
LEAP Office
747 Market Street, Room 900
Tacoma WA 98402
(253) 591-5590
leap@cityoftacoma.org

PRIME CONTRACTOR LEAP UTILIZATION PLAN

Failure to submit this plan at the Pre-Construction Meeting may result in Progress Payments being withheld.

Part A

Contractor:		Date:
Specification Number:	Contract/Work Order Number(s):	Contract Dollar Amount:
Project Description:		Notes:

PART B PLANNED LEAP HOURS*

Trade or Craft	City of Tacoma Resident	Economic Distressed Area Resident	Tacoma Public Utilities Service Area Apprentice Resident	WA State Apprentice *(Contracts outside of TPU Service Area Only)	
	hrs.	hrs.	hrs.	hrs.	
	hrs.	hrs.	hrs.	hrs.	Date
	hrs.	hrs.	hrs.	hrs.	
	hrs.	hrs.	hrs.	hrs.	
	hrs.	hrs.	hrs.	hrs.	
	hrs.	hrs.	hrs.	hrs.	Rejected
	hrs.	hrs.	hrs.	hrs.	
	hrs.	hrs.	hrs.	hrs.	Date
	hrs.	hrs.	hrs.	hrs.	
Totals					
					TOTAL hrs.

Part C

Provide a description of how the Contractor plans to ensure that the LEAP Utilization Requirements on the project will be met. (Use additional sheets if necessary)

General Instructions for completing Prime Contractor LEAP Utilization Plan

Part A

Contractor/Contract Information Section: The Prime Contractor is responsible for completing this section. Failure to submit this plan at the Pre-Construction Meeting may result in Progress Payments being withheld.

Part B

Planned LEAP Hours Section: This section should be completed by the Prime Contractor. The information required in Part B is described below.

Trade or Craft: Indicate the Trade or Craft being used.

LEAP Employee Categories: Indicate the number of hours that will be utilized by the Prime Contractor and all Sub Contractors for each craft and broken down by City of Tacoma Resident, City of Tacoma Apprentice, Youth, or Veteran, Pierce County Apprentice, Youth, or Veteran.

For Watershed Projects: King County Apprentice – Approved by Washington State and/or Seattle Renewal Community (CEZ) Resident.

For Hydro Projects: Area Residents (residing in either Pierce County or the County where the work is performed: Lewis, Mason, Grays Harbor or Thurston County), Tacoma Community Empowerment Zone Resident, City of Tacoma Residents.

Totals: Total the number of hours in each of the six (6) columns.

Total Planned LEAP Utilization Hours: This is the total number of hours planned on this project to satisfy the LEAP Utilization Requirement.

Part C

Description of how the Contractor plans to ensure fulfillment of the LEAP Utilization Requirement: This section is to be completed by the Prime Contractor. Please describe how you plan to satisfy the LEAP Utilization Requirement on this project. Provide a summary of your outreach and recruitment procedures to hire LEAP Qualified Employees to work on this project.

No Work Performed (NWP) Report

Prime/Sub Contractor: _____

Specification Number: _____

Project Description: _____

Payroll Week Ending Date: _____ Payroll Number: _____

NO WORK PERFORMED

I, the undersigned, do hereby certify under penalty of perjury, that the information contained herein is true and correct.

Signature of Responsible Officer

Title

Date



City of Tacoma LEAP Office
747 Market Street, Room 900
Tacoma, WA 98402
(253) 591-5590
leap@cityoftacoma.org
www.cityoftacoma.org/leap

LEAP EMPLOYEE VERIFICATION FORM

Contractor/Sub: _____ Specification Number: _____

Project Description: _____

Employee Name: _____ Craft: _____

Ethnic Group (*optional*): ☐ Asian/Pac Isl. ☐ Black ☐ Hispanic ☐ Native American ☐ White ☐ Other

Gender (*optional*): ☐ MALE ☐ FEMALE

Complete Physical Address (No PO Boxes): _____

City: _____ State: _____ Zip: _____ Telephone: _____ Date of Hire: _____

Apprenticeship County: _____ Apprentice Registration I.D. (*if applicable*): _____

Youth 18 – 24? Age: _____ Veteran? Copy of DD-214: _____

*******Please fill out entire form for tracking LEAP performance*******

LEAP qualified employee categories: (check all that apply and provide evidence for each check)

_____ a. Resident within the geographic boundaries of the City of Tacoma

_____ b. Resident within Economically Distressed ZIP Codes of the Tacoma Public Utilities Service Area

_____ c. WA State Approved Apprentice living in Tacoma Public Utilities Service Area

_____ d. WA State Approved Apprentice *(Only valid for contracts where 100% of work is performed outside of Pierce County)

Signature of Employee: _____ Date: _____

Contractor Representative: _____ Date: _____

LEAP EMPLOYEE VERIFICATION FORM

To be Completed by Contractor or Subcontractor

Please attach a legible copy of the following document(s) showing the address of residence as proof of local (Tacoma) and/or Pierce County residency and apprentice status, youth status, or veteran status.

.....

_____ For Youth - Copy of Birth Certificate or WA State ID or
_____ WA Driver's License (projects advertised after 05-20-13)

_____ For Veterans – Copy of DD-214

_____ Driver's License with current address

_____ Utility Bill/Phone Bill/Cell Bill/Cable Bill with current
_____ address

_____ Copy of current tax form W-4

_____ Rental Agreement/Lease (residential)

_____ Computer Printout from Other Government Agencies

_____ Property Tax Records

_____ Apprentice Registration I.D.

_____ Food Stamp Award Letter

_____ Housing Authority Verification

_____ Insurance Policy (Residence/Auto)

*Any of the above must have a complete physical address verified by the www.govme.org website.

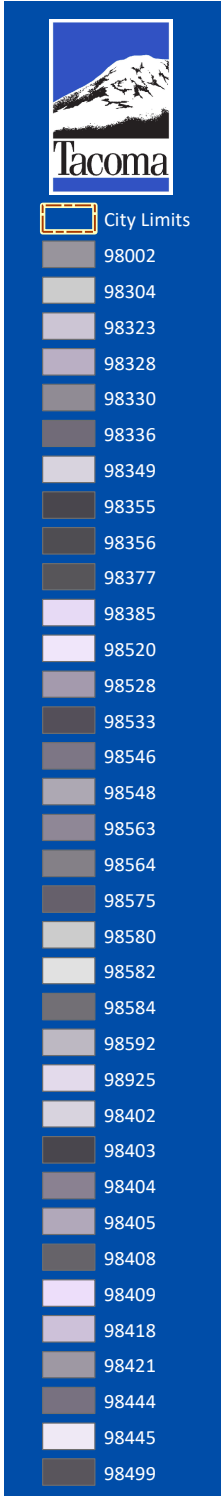
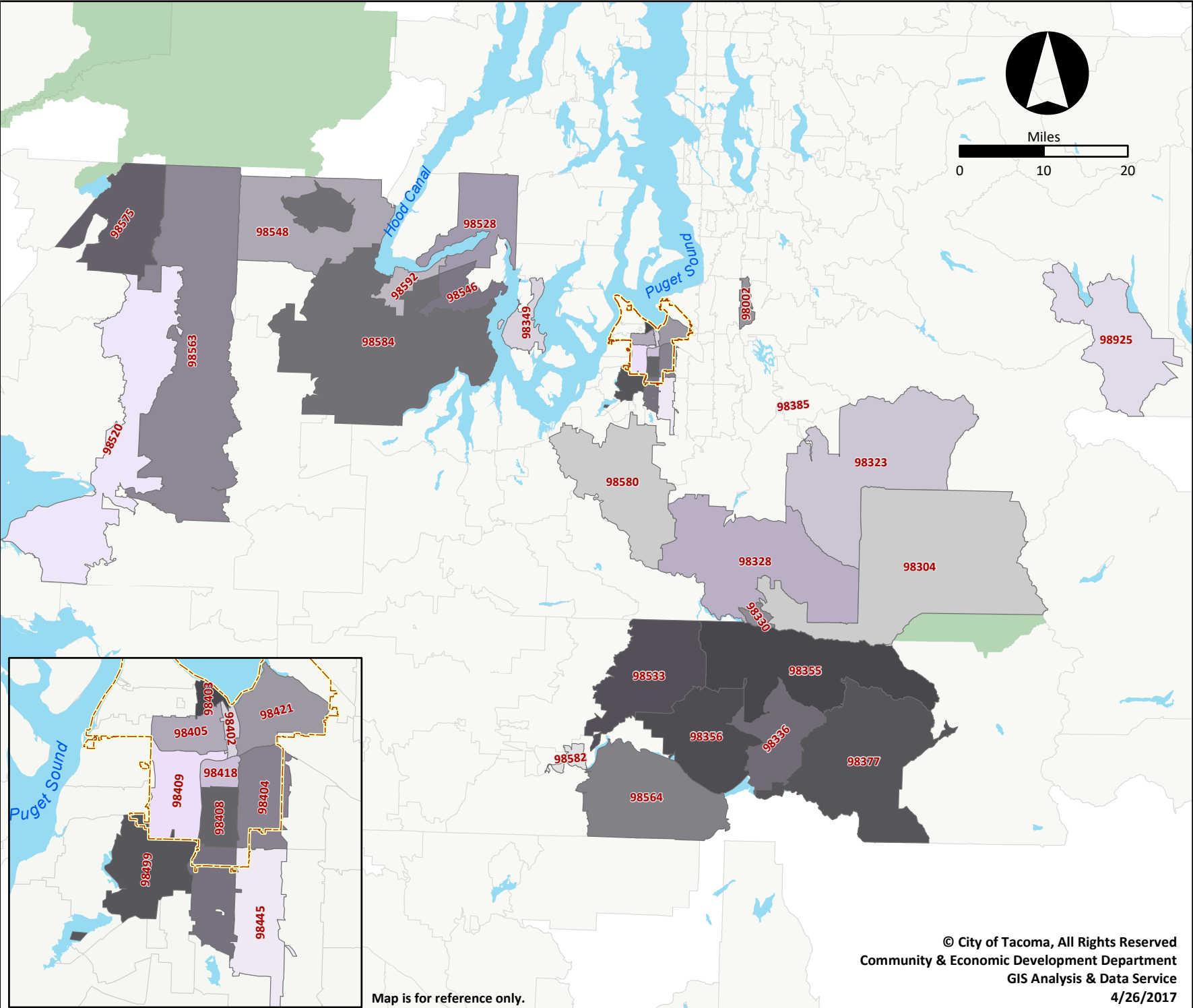
No PO Boxes

Contractor Representative: _____

Date: _____

Title: _____

Appendix C: Economically Distressed ZIP Codes Map



Tacoma Public Utilities Infrastructure and Service Area (Apprentice Utilization)

98001	Auburn	0.00%
98002	Auburn	0.00%
98003	Federal Way	0.00%
98010	Black Diamond	0.00%
98022	Enumclaw	0.00%
98023	Federal Way	0.00%
98030	Kent	0.00%
98032	Kent	0.00%
98038	Maple Valley	0.00%
98042	Kent	0.00%
98045	North Bend	0.00%
98051	Ravensdale	0.00%
98070	Vashon	0.00%
98092	Auburn	0.00%
98198	Seattle	0.00%
98304	Ashford	0.00%
98321	Buckley	0.27%
98323	Carbonado	0.05%
98327	DuPont	0.00%
98328	Eatonville	2.92%
98329	Gig Harbor	0.24%
98330	Elbe	0.00%
98332	Gig Harbor	0.00%
98333	Fox Island	0.00%
98335	Gig Harbor	0.05%
98336	Glenoma	0.00%
98338	Graham	0.79%
98349	Lakebay	0.06%
98354	Milton	0.01%
98355	Mineral	0.00%

98356	Morton	0.17%
98360	Orting	0.54%
98371	Puyallup	0.12%
98372	Puyallup	1.33%
98373	Puyallup	1.42%
98374	Puyallup	0.15%
98375	Puyallup	0.29%
98377	Randle	0.00%
98385	South Prairie	0.00%
98387	Spanaway	0.68%
98388	Spanaway	0.00%
98390	Sumner	0.12%
98391	Bonney	1.83%
98402	Tacoma	0.46%
98403	Tacoma	3.31%
98404	Tacoma	10.15%
98405	Tacoma	4.97%
98406	Tacoma	3.51%
98407	Tacoma	4.38%
98408	Tacoma	12.58%
98409	Tacoma	8.88%
98416	UPS	0.00%
98418	Tacoma	1.98%
98421	Tacoma	0.00%
98422	Tacoma	0.67%
98424	Tacoma	0.98%
98430	Camp Murray	0.00%
98433	Tacoma	0.00%
98438	McChord	0.00%
98439	Lakewood	0.00%

98443	Tacoma	0.00%
98444	Tacoma	7.20%
98445	Tacoma	2.09%
98446	Tacoma	0.17%
98447	PLU	0.00%
98465	Tacoma	0.44%
98466	Tacoma	0.06%
98467	University Place	0.09%
98498	Lakewood	0.05%
98499	Lakewood	0.26%
98520	Aberdeen	0.00%
98524	Allyn	0.97%
98528	Belfair	0.31%
98533	Cinebar	0.00%
98546	Grapeview	0.00%
98548	Hoodspoint	0.00%
98555	Lilliwaup	0.00%
98563	Montesano	0.21%
98564	Mossyrock	0.00%
98575	Quinalt	0.20%
98580	Roy	2.02%
98582	Salkum	0.00%
98584	Shelton	10.31%
98585	Silver Creek	0.00%
98591	Toledo	1.93%
98592	Union	0.00%
98597	Yelm	0.00%
98925	Easton	0.00%

Economically Distressed ZIP Codes (Journeyman AND Apprentice)

Zip Code	200% Pov	Unemployed	25+ College	Area
98002	Y		Y	Auburn
98304	Y		Y	Ashford/Rainier
98323	Y	Y	Y	Carbonado
98328	Y		Y	Eatonville
98330	Y		Y	Elbe
98336	Y		Y	Glenoma
98349	Y	Y		Lakebay
98355		Y	Y	Mineral
98356	Y	Y	Y	Morton
98377	Y	Y	Y	Randle
98385		Y	Y	South Prairie
98402	Y	Y		Downton
98403	Y	Y		Stadium/St. Helens
98404	Y	Y		Eastside
98405	Y	Y		Hilltop/Central
98408	Y		Y	South End
98409	Y	Y		South Tacoma
98418	Y		Y	Lincoln/South End
98421	Y	Y	Y	Port
98439	Y	Y		McChord AFB
98444	Y	Y		Parkland
98445	Y		Y	Midland
98499	Y	Y		Lakewood
98520	Y	Y	Y	Aberdeen
98528	Y		Y	Belfair
98533		Y	Y	Cinebar
98546	Y	Y	Y	Grapeview
98548	Y	Y	Y	Hoodsport
98563	Y	Y	Y	Montesano
98564	Y	Y	Y	Mossyrock
98575	Y		Y	Quinault
98580	Y		Y	Roy
98582	Y		Y	Salkum
98584	Y		Y	Shelton
98591	Y		Y	Toledo
98592		Y	Y	Union
98925	Y		Y	Easton

PART VIII

**STATE PREVAILING WAGE RATES AND GENERAL
REQUIREMENTS**

PREVAILING WAGE RATES

This project requires prevailing wages under [39.12 RCW](#). Any worker, laborer, or mechanic employed in the performance of any part of the work shall be paid not less than the applicable prevailing rate of wage.

The project site is located in Pierce County.

The effective date for prevailing wages on this project will be the **submittal deadline** with these exceptions:

- a. If the project is not awarded within six months of the submittal deadline, the award date is the effective date.
- b. If the project is not awarded pursuant to a competitive solicitation, the date the contract is executed is the effective date.
- c. Janitorial contracts follow WAC 296-127-023.

Except for janitorial contracts, these rates shall apply for the duration of the contract unless otherwise noted in the solicitation.

Look up prevailing rates of pay, benefits, and overtime codes from this link:

<https://secure.lni.wa.gov/wagelookup/>

REQUIRED FILINGS

The contractor and all subcontractors covered under [39.12 RCW](#) shall submit to the Department of Labor and Industries (L&I) for work provided under this contract:

1. A Statement of Intent to Pay Prevailing Wages must be filed with and approved by L&I upon award of contract.
2. An Affidavit of Wages Paid must be filed with and approved by L&I upon job completion.

Payments cannot be released by the City until verification of these filings are received by the engineer. Additional information regarding these filings can be obtained by calling the Department of Labor & Industries, Prevailing Wage at 360-902-5335, <https://www.lni.wa.gov/> or by visiting their MY L&I account.