



City of Tacoma
Environmental Services Department

SPECIFICATION NO. ES22-0204F

SOLID WASTE MANAGEMENT Downtown Compactor Enclosure Upgrade Project

Project No. ENV-00116-04-06

CITY OF TACOMA
ENVIRONMENTAL SERVICES DEPARTMENT

REQUEST FOR BIDS, SPECIAL PROVISIONS, BID PROPOSAL AND CONTRACT

FOR

SPECIFICATION NO.
ES22-0204F

SOLID WASTE MANAGEMENT
Downtown Compactor Enclosure Upgrade Project

PROJECT NO. ENV-00116-04-06

Divisions 00
Jody Bratton, P.E.
Science & Engineering Division
Environmental Services Department
3510 South Mullen Street
Tacoma, Washington 98409



**City of Tacoma
Environmental Services/Science and Engineering Division**

**REQUEST FOR BIDS ES22-0204F
Solid Waste Management Downtown Compactor Enclosure
Upgrade Project**

Submittal Deadline: 11:00 a.m., Pacific Time, Tuesday, January 31, 2023

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

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 in person at the project site located at 801 Court A South, Tacoma WA 98402 on **Tuesday, January 16, 2023**. NOTE: this is an outdoor location in downtown Tacoma, WA. Parking is limited near the site so encourage carpooling for companies to consider.

Project Scope: The Work generally includes, but not limited to, installation of site improvements to support City supplied solid waste compactor unit and/or recycling collection containers at two downtown Tacoma locations. The project includes installation of concrete pads and sidewalk, integral architectural CMU and metal enclosure, landscaping and irrigation improvements, lighting and cameras systems, electrical wiring and cabinets

Estimate: \$450,000 to \$650,000.

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.

<p>The following Specification Sections were developed by or under the supervision of:</p> <p>Jody Bratton, P.E. Science & Engineering Division Environmental Services Department 3510 South Mullen Street Tacoma, Washington 98409</p> <p>Sections: Division 00 01 14 01 01 31 50 01 60 00</p>	
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**The following Specification Sections
were developed by or under the
supervision of:**

Olivia Paraschiv, PE
KPG/Psomas, Inc.
2502 Jefferson Avenue
Tacoma, WA 98402

Sections:

01 07 23
01 55 26
02 41 00
31 11 00
31 20 00
31 23 33
32 12 16
32 16 13
32 16 23
32 16 33
32 17 23
33 14 00
33 31 00
33 42 00



**The following Specification Sections
were developed by or under the
supervision of:**

Ade Bright, SE
Bright Engineering
1809 7th Ave #1100
Seattle, WA 98101

Sections:

01 11 00
01 11 12
01 29 73
01 29 76
01 32 10
01 33 00
01 40 00
01 73 24
01 50 00
01 74 19
01 78 00
01 78 39
01 91 00
03 30 31
03 60 00
05 05 14
05 05 20
05 05 23
05 50 00

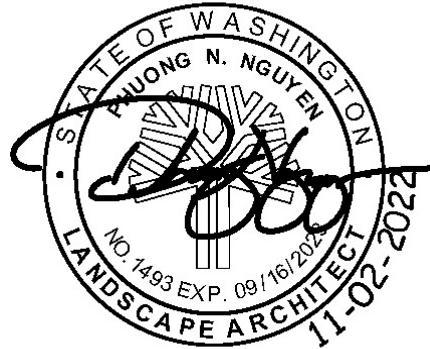


**The following Specification Sections
were developed by or under the
supervision of:**

Phuong Nguyen, PLA
KPG/Psomas, Inc.
3131 Elliott Avenue, Suite 400
Seattle, WA 98121

Sections:

03 45 00
04 22 00
05 07 00
07 19 00
07 90 00
08 70 00
09 24 23
09 90 00
31 13 00
32 31 24
32 81 00
32 90 00



**The following Specification Sections
were developed by or under the
supervision of:**

Roger Au, PE
Tres West Engineers, Inc.
2702 S 42nd Street, Suite 301
Tacoma, WA 98409

Sections:

26 05 00
26 05 01
26 05 02
26 05 19
26 05 23
26 05 26
26 05 29
26 05 33
26 05 41
26 05 53
26 08 00
26 24 16
26 27 17
26 27 26
26 28 13
26 28 16
26 56 00
28 13 00



11/02/2022

SPECIFICATION NO. ES22-0204F

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City of Tacoma
Community & Economic Development
747 Market Street, Rm 900
Tacoma WA 98402

CITY OF TACOMA EQUITY IN CONTRACTING (EIC) AND LEAP PROGRAMS

Bidders Special Instructions

As part of the City of Tacoma's ongoing work to address past disparities and to increase the City's contracting with and utilization of historically underutilized businesses, the Equity in Contracting (EIC) Program places requirements on City contracts for utilization of businesses certified by the Washington State Office of Minority and Women's Business Enterprise (OMWBE) and approved by the Equity in Contracting Program ("Certified Businesses"). The EIC Program also provides guidance and technical assistance to Certified Businesses who are interested in providing supplies, services and public works to the City of Tacoma.

The EIC Program requirements are contained in [Tacoma Municipal Code Chapter 1.07](#).

Contractors bidding on City of Tacoma projects are required to meet the stated EIC requirements. Bids will be evaluated on an individual basis to determine EIC compliance. **A contractor who fails to meet the stated EIC requirements will be considered non-responsible.** Bidders are also subject to the City's Equal Employment Opportunity policies prohibiting discrimination.

The stated EIC requirements may be met by the contractor or by identified subcontractors. All EIC Requirements may be met by using MBEs, WBEs, DBEs or SBEs from the OMWBE certified list ([OMWBE website](#)). It is the bidder's responsibility to ensure that their firm or identified subcontractors are certified by OMWBE and approved by the City of Tacoma EIC Program **at the time of bid submittal**. Business certification may be verified by contacting the EIC Office*.

For the OMWBE list, be sure to look for businesses in Pierce, King, Lewis, Mason, Grays Harbor, Thurston, or any counties adjacent to the county in which the work is performed per 1.07.050(2)(b-c). Contact the EIC Office if you have any questions.*

The Equity in Contracting (EIC) forms included in these bid documents must be fully completed (including attachments) and included with bid submittals. Failure to include the required forms will result in the submittal being rejected as nonresponsive.

Post-Award Important Information

For all contracts that have requirements related to the EIC and LEAP policies, the City of Tacoma is utilizing two cloud-based software systems:

- **B2Gnow** - Contractors and subcontractors must report payment information in the B2Gnow System on a monthly basis. The EIC Staff will monitor/audit that retainage is paid by the prime contractor to the subcontractor(s) within 10 [working] days after the subcontractors' work is satisfactorily completed. This will be monitored/audited using the B2Gnow System.
- **LCP Tracker** - This system must be used for submitting certified payroll(s) for both EIC and LEAP compliance.



City of Tacoma
Community & Economic Development
747 Market Street, Rm 900
Tacoma WA 98402

Both systems are monitored/audited by EIC and LEAP staff to ensure contract compliance, proactively identify potential issues and track contract progress.

***EIC & LEAP STAFF Contact Information**

- **For questions regarding Certifications, EIC Compliance and B2GNow support, contact EIC Staff:**
Malika Godo at (253) 591-5630, or via email at mgodo@cityoftacoma.org
Gary Lizama at (253) 591-5826, or via email at glizama@cityoftacoma.org
- **For questions in regards to LEAP compliance and LCP Tracker support, contact LEAP Staff:**
Deborah Trevorrow at (253) 591-5590, or via email at dtrevorrow@cityoftacoma.org



City of Tacoma
Environmental Services Department
Science and Engineering Division

SUBSTITUTION REQUIREMENTS

Bidders are allowed to submit substitutions for products outlined in the technical specifications where "or approved equal" is noted in the specifications. Refer to Section 1.04 in P A R T III SUPPLEMENTAL CONDITIONS AS MODIFIED BY THE CITY OF TACOMA and in Division 01, Specification 01 60 00, Product Substitution for requirements on substitutions. The Substitution Request Form and all supporting documentation must be submitted for consideration as outlined in the above specifications and requirements.

Substitution Request Form

Project: _____ Substitution Request Number: _____

From: _____
To: _____ Date: _____

Engineer Project Number: _____
Re: _____ Contract For: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Installer: _____ Address: _____ Phone: _____

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

☐ Point-by-point comparative data attached - REQUIRED BY ENGINEER

Reason for not providing specified item: _____

Similar Installation: _____

Project: _____ Architect: _____

Address: _____ Owner: _____

_____ Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

Savings to Owner for accepting substitution: _____ (\$ _____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost and schedule data as stated above is complete. Claims for additional costs or time related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including Engineer design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: _____

ENGINEER's REVIEW AND ACTION

- ☐ Substitution accepted - Make submittals in accordance with Specification Section 01 33 00.
- ☐ Substitution accepted as noted - Make submittals in accordance with Specification Section 01 33 00
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ Engineer ☐ _____

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. Executed Bid Bond must be received within 10 days after submittal deadline to the City of Tacoma Purchasing Division 3628 South 35th Street,,Tacoma, WA 98409. 98409.
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. EQUITY IN CONTRACTING (EIC) UTILIZATION FORM Bidders shall complete the Equity in Contracting Utilization Form in accordance with the City of Tacoma Equity in Contracting Regulations Manual and Chapter 1.07 of the City of Tacoma Municipal Code (TMC). This form shall be fully and accurately completed and returned with submission of the Bid and will be used to determine if the Bidder is in compliance with the EIC regulations and the TMC.

As part of the City of Tacoma's ongoing work to address past disparities and to increase the City's contracting with and utilization of historically underutilized businesses, the Equity in Contracting (EIC) Program places requirements on City contracts for utilization of businesses certified by the Washington State Office of Minority and Women's Business Enterprise and approved by the Equity in Contracting Program ("Certified Businesses"). The EIC Program also provides guidance and technical assistance to Certified Businesses who are interested in providing supplies, services and public works to the City of Tacoma. The EIC Program requirements are contained in Tacoma Municipal Code Chapter 1.07.

See City of Tacoma – Equity In Contracting Program section for additional information.

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 a violation of the City's Code of Ethics containediin TMC Chapter 1.46 shall constitute a breach of 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 skills, 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. 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.

C. 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.

PART I

BID PROPOSAL AND CONTRACT FORMS

BID PROPOSAL

SPECIFICATION NO. ES22-0204F

Solid Waste Management Downtown Compactor Enclosure Upgrade Project

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-02009-02 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. Unit prices of all items, all extensions and total amount of bid should be shown. Show unit prices in figures only.

<u>ITEM NO.</u>	<u>ITEM DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
1.	Downtown Compactor Enclosure Site A, work shall include, but is not necessarily limited to, all supervision, labor, materials, equipment and landscaping, required to provide in every aspect all requirements as necessary to accomplish the Work as per Contract Documents.	1 Lump Sum	Lump Sum	\$ _____
2	Downtown Compactor Enclosure Site B, work shall include, but is not necessarily limited to, all supervision, labor, materials, equipment and landscaping, required to provide in every aspect all requirements as necessary to accomplish the Work as per Contract Documents.	1 Lump Sum	Lump Sum	\$ _____

Base Bid (Subtotal Item No. 1 & 2) \$ _____

10.3% Sales Tax (Item No. 1&2) \$ _____

Grand Total \$ _____

SIGNATURE PAGE

CITY OF TACOMA ENVIRONMENTAL SERVICES/SCIENCE AND ENGINEERING DIVISION

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 Bid 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 BID SPECIFICATION NO. ES22_0204F Downtown Compactor Facility Upgrade – 2 Sites

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 (January 3, 2023), 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 _____

EIC REQUIREMENT FORM

EQUITY IN CONTRACTING REQUIREMENTS & PROCEDURES:

All bidders must complete and submit with their bid the following solicitation form contained in the bid submittal package:

City of Tacoma – EIC Utilization Form

IMPORTANT NOTE:

It is the bidder's responsibility to ensure that the subcontractor(s) listed on the EIC Utilization Form are currently certified by the State of Washington's Office of Minority and Women Business Enterprises (OMWBE) at the time of bid opening. This may be verified by contacting the EIC Office at 253-591-5075 between 8 AM and 5 PM, Monday through Friday or the [OMWBE](http://www.omwbe.com) Office at (866) 208-1064. Please refer to the City of Tacoma EIC code.

EQUITY IN CONTRACTING REQUIREMENTS

Minority Business
Enterprise Requirement

4%

Women Business
Enterprise Requirement

2%

Small Business Enterprise
Requirement

5%

A list of EIC-eligible companies is available on the following web site addresses:

www.omwbe.diversitycompliance.com*

MATERIAL MISSTATEMENTS CONCERNING COMPLETED ACTIONS BY THE BIDDER IN ANY SWORN STATEMENT OR FAILURE TO MEET COMMITMENTS AS INDICATED ON THE EIC UTILIZATION FORM MAY RENDER THE BIDDER IN DEFAULT OF CITY ORDINANCE 1.07

CCD/SBE: ENV-00116-04-06
Date of Record: 11/04/2022
Project Spec#: ES22-0204F
Project Title: Downtown Compactor Enclosure

*For the OMWBE list, be sure to look for businesses in Pierce, King, Lewis, Mason, Grays Harbor, Thurston, or any counties adjacent to the county in which the work is performed per 1.07.050(2)(b-c). Contact the EIC Office if you have any questions.



City of Tacoma
Community & Economic Development
Office of Equity in Contracting
747 Market Street, Rm 900
Tacoma WA 98402
253-591-5826
Email: EICOffice@cityoftacoma.org

EQUITY IN CONTRACTING UTILIZATION FORM

This form is to document **only** the contractors, subcontractors, material suppliers or other types of firms that are intended to be used to meet the stated EIC requirements for the contract awarded from this solicitation. This information will be used to determine contract award. Additional forms may be used if needed.

- You must include this form with your bid submittal in order for your bid to be responsive.
- Prime contractors are **required** to solicit bids from Businesses that are "Certified" by the Office of Minority and Women's Business Enterprises (OMWBE) www.omwbe.wa.gov as a MBE, WBE, and SBE to be known as "Certified Business".
- It is the Prime contractor's responsibility to verify the certification status of the business(s) intended to be utilized prior to the submittal deadline.

Bidder's Name: _____

Address: _____ City/State/Zip: _____

Spec. No. _____ Base Bid * \$ _____ **Complete business names and phone numbers are required to verify your usage of Certified Businesses**

a. Business Name and Certification Number(s)	b. MBE, WBE, or SBE (Write all that apply)	c. NAICS code(s)	d. Contractor Bid Amount (100%)	e. Material Supplier Bid Amount (20%)	f. Estimated MBE Usage Dollar Amount	g. Estimated WBE Usage Dollar Amount	h. Estimated SBE Usage Dollar Amount
i. MBE Utilization %	j. WBE Utilization %	k. SBE Utilization %					

By signing and submitting this form the bidder certifies that the OMWBE Certified Business(s) listed will be used on this project including all applicable change orders.

Type or Print Name of Responsible Officer / Title

Signature of Responsible Officer

Date

INSTRUCTIONS FOR COMPLETING EIC UTILIZATION FORM

The purpose of these instructions is to assist bidders in properly completing the EIC Utilization Form.

This form when submitted with your bid, provides information to the City of Tacoma to accurately review and evaluate your proposed EIC usage.

1. * Base Bid is the prime contractor's bid, plus any alternates, additives and deductibles selected by the City of Tacoma. Also, please refer to Items #10-12 below.
2. Column "a" – List all **Certified Business(s)** that you will be awarding a contract to if you are the successful bidder.
3. Column "b" – Identify if the **Certified Business(s)** is being utilized as an MBE, WBE, or SBE. (Businesses may count towards multiple requirements).
4. Column "c" – List the appropriate NAICS code(s) for the scope of work, services, or materials/supplies for each **Certified Business**.
5. Column "d" – The bid amount must be indicated for **all** listed **Certified Businesses** that you plan on doing business with. This quote is the price that you and the **Certified Businesses** have negotiated prior to bid opening.
6. Column "e" – The bid amount must be indicated for **all** listed **Certified Businesses** that you plan on doing business with. This quote is the price that you and the material supplier have negotiated prior to bid opening.
7. Column "f" – Estimated MBE Usage Dollar Amount: For all MBE firms used, multiply the amount in Column "d" by 1.0 plus the amount in Column "e" by 0.20. Insert the total amount in this column.
8. Column "g" – Estimated WBE Usage Dollar Amount: For all WBE firms used, multiply the amount in Column "d" by 1.0 plus the amount in Column "e" by 0.20. Insert the total amount in this column.
9. Column "h" – Estimated SBE Usage Dollar Amount: For all MBE, WBE, or SBE firms used, Multiply the amount in Column "d" by 1.0 plus the amount in Column "e" by 0.20. Insert the total amount in this column.
10. Block "i" – The percentage of actual MBE utilization calculated on the Base Bid only. (Divide the sum of Estimated MBE Usage Dollar Amount (Column "f") by your Base Bid (*) then multiply by 100 to get a percentage: \$ amounts from column "f" divided by Base Bid (*) x 100 = MBE usage as a percentage of the Base Bid.)
11. Block "j" – The percentage of actual WBE utilization calculated on the Base Bid only. (Divide the sum of Estimated WBE Usage Dollar Amount (Column "g") by your Base Bid (*) then multiply by 100 to get a percentage: \$ amounts from column "g" divided by Base Bid (*) x 100 = WBE usage as a percentage of the Base Bid.)

12. Block “k” – The percentage of actual SBE utilization calculated on the Base Bid only. (Divide the sum of Estimated SBE Usage Dollar Amount (Column “h”) by your Base Bid (*) then multiply by 100 to get a percentage: \$ amounts from column “h” divided by Base Bid (*) x 100 = SBE usage as a percentage of the Base Bid.)

It is the prime contractor’s responsibility to check the status of **Certified Businesses** prior to bid opening. Call the EIC Office at 253-591-5826 or email at EICOffice@cityoftacoma.org for additional information.

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. ES22_0204F Downtown Compactor Facility Upgrade – 2 Sites together with all authorized addenda.
 2. Contractor's submittal dated [Enter Submittal Date] submitted in response to Specification No. ES22-0204F Downtown Compactor Facility Upgrade – 2 Sites.
-

- 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. The Contract terminates on [Termination Date].
- IV. 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.
- V. 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.
- VI. 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.
- VII. 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.
- VIII. 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:

CONTRACTOR:
Signature:

Name:

Name:

Title:

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, [REDACTED], 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 CONDITIONS FOR
WASHINGTON STATE FACILITY
CONSTRUCTION**

**SECTION 00 73 00
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Section 00 73 00
PART 1 GENERAL PROVISIONS

1.01 DEFINITIONS

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:*
- AB. "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.
- AC. "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.
- AD. "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.
- AE. "Calendar Day" is the 24-hour period from midnight to midnight.
- AF. "City" is the City of Tacoma.
- AG. "Contracting Agency" (or City) is the City of Tacoma.
- AH. "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, LEAP and SBE.

- AI. "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.
- AJ. "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and other.
- AK. "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.
- AL. "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.
- AM. "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.
- AN. "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.
- AO. "Provide" means to furnish and install, complete and ready for intended use.
- AP. "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.
- AQ. "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.
- AR. "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:

- A. Addenda.
- B. Signed Public Works Contract, including any Change Orders, and any Special Forms.
- C. Supplemental Conditions as modified by the City of Tacoma.
- D. General Conditions for Washington State Facility Construction.
- E. Specifications – provisions in Division 1 shall take precedence over provisions of any other Division.
- F. Amendments to Specifications.
- G. Drawings – in case of conflict within the Drawings, large scale drawings shall take precedence over small scale drawings.
- H. Construction Documents Appendices.
- I. Signed and Completed Form of Proposal.
- J. Instructions to Bidders.
- K. Advertisement for Bids.

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 use desired. 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 61 00, Common Products 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 61 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 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. The Contractor fails to meet the SBE requirements as described in these documents;
 - 13. Receipt of addenda is not acknowledged; or
 - 14. There are any other reasons deemed proper by the City.
- 15. Contractor has altered in any form or fashion the City's bid proposal form

1.06 AWARD OF CONTRACT

- 1. Add the following new Section 1.06 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.

1.07 MINIMUM EXPERIENCE REQUIREMENTS

Add the following new Section 1.07 to the City Supplemental Conditions:

The Bidder shall submit if required as part of its bid submittal package the necessary information on the Statement of Qualifications Project Experience Form to demonstrate compliance with the minimum experience requirements. The City reserves the right to request for clarifying or additional information.

1.08 UTILITY COORDINATION

Add the following new Section 1.08 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
 - 1. City of Tacoma Water Division, Contact: Gary Gates, Phone: 253-502-8742
 - 2. City of Tacoma Power Division, Contact: Daniel Pitsch, Phone: 253-502-8229
 - 3. City of Tacoma Sewer Utility, Contact: Merita Trohimovich Pollard, Phone: 253-502-2103
 - 4. Puget Sound Energy, Contact: Greg Potter, Phone: 253-841-6242 ext. 10
 - 5. Century Link , Contact: Judy Cissell, Phone: 206-733-8860
 - 6. One Call Locators Service: 1-800-424-5555
 - 7. Comcast communications: Contact: Customer Service, Phone: 877-824-2288
- 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.

1.09 TRAFFIC CONTROL

2. Add the following new Section 1.09 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.

- D. The Contractor shall be responsible for obtaining all permits necessary to implement the traffic control plan.

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.M. Best Rating shall not be lower than A(-) VII.

Replace Section 2.01.A of Insurance and Bonds with the following City Supplemental Conditions:

- A. Term of insurance coverage: Contractor shall maintain the following insurance coverage during the Work and for two years after Final Completion. Contractor shall also maintain the following insurance coverage during the performance of any corrective Work required by Section 5.16.
1. Commercial General Liability Insurance shall be written on an Insurance Services Office form CG0001 (04 13) or the equivalent. Coverage shall include, but not be limited to:
 - a. Completed operations/products liability;
 - b. Explosion, collapse, and underground;
 - c. Employer's liability coverage..
 2. Automobile Liability Insurance on shall be written on an insurance Services office form CA0001 or the equivalent. Contractor must also maintain an MCS 90 endorsement of equivalent and a CA 9948 endorsement or equivalent if "Pollutants" are to be transported.
- B. Industrial insurance compliance: Contractor shall comply with the Washington State.
- C. Insurance to protect the following:
- D. Owner as Additional Insured: All insurance coverages shall be endorsed to include City as an additional insured for both ongoing and completed operations using Insurance Services Office Forms CG2010 and CG2037 or the equivalent for Work performed in accordance with the Contract Documents, and all insurance certificates shall be accompanied with the policy endorsement showing

the City as an additional insured. Contractor's insurance shall be primary and non-contributory with any insurance or self-insurance maintained by the City and contain a "separation of insured" provision and a "waiver of subrogation" clause favor of City of Tacoma (Owner)

3.

4. Add the following new Section 2.01.E to City Supplemental Conditions:

E. Any additional coverage specifically required within the project manual.

2.02 COVERAGE LIMITS

Replace Section 2.02 with City Supplemental Conditions:

Commercial General Liability:

\$1,000,000 Each Occurrence, \$2,000,000 General Aggregate

\$2,000,000 Products-Completed Operations Aggregate

\$1,000,000 Personal Injury & Advertising Injury

Employers Liability:

\$1,000,000 each employee

\$1,000,000 each accident

\$1,000,000 policy limit

Commercial Automobile Liability:

\$1,000,000 each accident for any vehicle for bodily injury and property damage.

Workers Compensation: Statutory

Professional Liability:

\$1M per claim and \$2M in the aggregate

2.03 INSURANCE COVERAGE CERTIFICATES

Add the following Articles to Section 2.03 with City Supplemental Conditions:

D. The following shall be required:

1. The Contractor shall furnish acceptable proof of insurance coverage on an Acord Certificate of insurance or the equivalent.
2. A copy of the additional insured endorsements must accompany the insurance certificate. A copy of each of the endorsement are required.
Additional insured primary and non-contributory, and waiver of subrogation..

E. The following additional requirements apply:

1. Contractor shall provide with the certificate, evidence of the amount of any deductible or self-insured retention under the policy.
2. It is the Contractor's responsibility to keep an up-to-date Certificate of Insurance on file with the City throughout the contract and must provide 30 day notice of any cancellation.

G. All Insurance coverage the Contractor is required to maintain under this Article shall be written on an "occurrence" basis and not on a "claims made" basis.

2.04 PAYMENT AND PERFORMANCE BONDS

Replace the entire Section 2.04 with the following City Supplemental Conditions:

A Performance Bond shall be obtained by the Contractor utilizing the form entitled "Performance Bond to the City of Tacoma" as found at the front of the Contract Document under "Contract Forms". Contractor shall provide a Performance Bond, including power of attorney, for 100 percent of the amount of his/her bid (including sales tax) per RCW 39.08 securing performance of work; all Contract obligations; materials, payment of laborers, Manufacturers and subcontractors.

In the event that the Contractor intends to have a subcontractor perform all or any 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:

D. The Contract amount is increased by 20% or more.

2.06 BUILDER'S RISK

Add Section 2.06.A with the following City Supplemental Conditions:

A. For projects not involving New Building Construction, 'Installation Floater' is an acceptable substitute for the Builder's Risk Insurance.

Add the following provisions Article B of Section 2.06 of Insurance and Bonds:

B. Reasonable compensation for A/E services and expenses required as a result of an insured loss shall not exceed \$300,000.00. Any deductible provision in the Builder's Risk Insurance will be paid for by the City, but shall not exceed \$10,000.00. Flood, earthquake, and terrorism insurance are not required under this Contract.

PART 3 TIME AND SCHEDULE

3.02 CONSTRUCTION SCHEDULE

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

C. 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:

D. 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:

PART 1 Actual starts and finishes of activities and changes in slack or float, lags and leads for each item;
PART 2 Percent complete;
PART 3 Changes in network logic.

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

- a. Problem areas; anticipated delay; and impact of these on Schedule.
- b. Report corrective action taken, or proposed, and its effect.
- c. Should actual progress fall more than two (2) weeks 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 Contractors 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 or 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.

- D. 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").

- E. 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.
- F. 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.

- G. 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 final 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 final completion

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 2 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.

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:

- B. 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:

1. 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.
2. 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.
3. 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.
4. Post all permits, notices, and/or approvals in a conspicuous location at the construction site.
5. 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.
6. All construction personnel shall wear highly visible reflective vests and hardhats while on North End Treatment Plant 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 2 Days 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 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.
 1. Tests and Inspections shall include the following minimum requirements:
 - a. Preparatory Inspection (pre-installation meetings): This shall be performed prior to beginning any work and shall include:
 - b. A review of applicable specifications;
 - c. A review of the Contract plans;
 - d. A check to assure that all materials and/or equipment have been tested, submitted and approved;
 - e. A check to assure that provisions have been made to provide control inspection and testing;
 - f. Examination of the work area to assure that all required preliminary work has been completed and is in Contract compliance;
 - g. 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;
 - h. Discussion of procedures for constructing the work, including repetitive deficiencies, construction tolerances and workmanship standards specified in the documents.
 - i. Initial Inspection: This shall be performed as soon as work begins on a definable feature of work and the following shall be accomplished:
 - j. A check of preliminary work to ensure that it is in Contract compliance and review of the preparatory meeting minutes;
 - k. Verification of full Contract compliance and verify that required control inspection and testing is underway;
 - l. Establish level of workmanship, verify that it meets minimum acceptable workmanship standards, and compare work with sample panels, etc., as appropriate;
 - m. Resolve all differences;
 - n. This inspection phase shall be repeated for each new crew on site performing the work, or any time standards are not being met.
 - o. 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.
 - p. Tests: All operation and acceptance tests, where specified, are to be performed to verify control measures are adequate.
 - q. 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:
- e. 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.

Add Section 5.23 with City Supplemental Conditions:

5.23 ADJACENT PROPERTIES AND FACILITIES

- 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 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 satisfactory 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 14 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:

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:

- A. 1% for Contractor: For Contractor, 1% of direct labor costs.
- B. 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 7.02B 7a – 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, 7.02.D with City Supplemental Conditions:

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

Add Section 7.02.D 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. Within 14 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 30 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:

8. 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

P A R T III

SUPPLEMENTAL CONDITIONS

AS MODIFIED

BY THE

CITY OF TACOMA

**SECTION 00 73 00
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Section 00 73 00

PART 1 GENERAL PROVISIONS

1.01 DEFINITIONS

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:*
- AB. "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.
- AC. "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.
- AD. "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.
- AE. "Calendar Day" is the 24-hour period from midnight to midnight.
- AF. "City" is the City of Tacoma.
- AG. "Contracting Agency" (or City) is the City of Tacoma.
- AH. "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, LEAP and SBE.

- AI. "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.
- AJ. "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and other.
- AK. "Holiday(s)" means the following calendar days: January 1st, 3rd Monday of January, 3rd Monday of February, last Monday of May, June 19th, 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.
- AL. "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.
- AM. "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.
- AN. "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.
- AO. "Provide" means to furnish and install, complete and ready for intended use.
- AP. "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.
- AQ. "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.
- AR. "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:

- A. Addenda.
- B. Signed Public Works Contract, including any Change Orders, and any Special Forms.
- C. Supplemental Conditions as modified by the City of Tacoma.
- D. General Conditions for Washington State Facility Construction.
- E. Specifications – provisions in Division 1 shall take precedence over provisions of any other Division.
- F. Amendments to Specifications.
- G. Drawings – in case of conflict within the Drawings, large scale drawings shall take precedence over small scale drawings.
- H. Construction Documents Appendices.
- I. Signed and Completed Form of Proposal.
- J. Instructions to Bidders.
- K. Advertisement for Bids.

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 use desired. 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 of materials. 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 60 00, Product Substitutions** 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 60 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 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. The Contractor fails to meet the SBE requirements as described in these documents;
 13. Receipt of addenda is not acknowledged; or
 14. There are any other reasons deemed proper by the City.
15. Contractor has altered in any form or fashion the City's bid proposal form

1.06 AWARD OF CONTRACT

1. Add the following new Section 1.06 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 UTILITY COORDINATION

Add the following new Section 1.08 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
 - 1. City of Tacoma Water Division, Contact: Gary Gates, Phone: 253-502-8742
 - 2. City of Tacoma Power Division, Contact: Daniel Pitsch, Phone: 253-502-8229
 - 3. City of Tacoma Sewer Utility, Contact: Merita Trohimovich Pollard, Phone: 253-502-2103
 - 4. Puget Sound Energy, Contact: Greg Potter, Phone: 253-841-6242 ext. 10
 - 5. Century Link , Contact: Judy Cissell, Phone: 206-733-8860
 - 6. One Call Locators Service: 1-800-424-5555
 - 7. Comcast communications: Contact: Customer Service, Phone: 877-824-2288
- 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.

1.09 TRAFFIC CONTROL

- 2. Add the following new Section 1.09 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.
 - D. The Contractor shall be responsible for obtaining all permits necessary to implement the traffic control plan.

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.M. Best Rating shall not be lower than A(-) VII.

Replace Section 2.01.A of Insurance and Bonds with the following City Supplemental Conditions:

- A. Term of insurance coverage: Contractor shall maintain the following insurance coverage during the Work and for two years after Final Completion. Contractor shall also maintain the following insurance coverage during the performance of any corrective Work required by Section 5.16.
 - 1. Commercial General Liability Insurance shall be written on an Insurance Services Office form CG0001 (04 13) or the equivalent. Coverage shall include, but not be limited to:
 - a. Completed operations/products liability;
 - b. Explosion, collapse, and underground;
 - c. Employer's liability coverage..
 - 2. Automobile Liability Insurance on shall be written on an insurance Services office form CA0001 or the equivalent. Contractor must also maintain an MCS 90 endorsement of equivalent and a CA 9948 endorsement or equivalent if "Pollutants" are to be transported.
- B. Industrial insurance compliance: Contractor shall comply with the Washington State.
- C. Insurance to protect the following:
- D. Owner as Additional Insured: All insurance coverages shall be endorsed to include City as an additional insured for both ongoing and completed operations using Insurance Services Office Forms CG2010 and CG2037 or the equivalent for Work performed in accordance with the Contract Documents, and all insurance certificates shall be accompanied with the policy endorsement showing the City as an additional insured. Contractor's insurance shall be primary and non-contributory with any insurance or self- insurance maintained by the City and contain a "separation of insured" provision and a "waiver of subrogation" clause

favor of City of Tacoma (Owner)

3.

4. Add the following new Section 2.01.E to City Supplemental Conditions:

E. Any additional coverage specifically required within the project manual.

2.02 COVERAGE LIMITS

Replace Section 2.02 with City Supplemental Conditions:

Commercial General Liability:

\$1,000,000 Each Occurrence, \$2,000,000 General Aggregate

\$2,000,000 Products-Completed Operations Aggregate

\$1,000,000 Personal Injury & Advertising Injury

Employers Liability:

\$1,000,000 each employee

\$1,000,000 each accident

\$1,000,000 policy limit

Commercial Automobile Liability:

\$1,000,000 each accident for any vehicle for bodily injury and property damage.

Workers Compensation: Statutory

Professional Liability:

\$1M per claim and \$2M in the aggregate

2.03 INSURANCE COVERAGE CERTIFICATES

Add the following Articles to Section 2.03 with City Supplemental Conditions:

D. The following shall be required:

1. The Contractor shall furnish acceptable proof of insurance coverage on an Acord Certificate of insurance or the equivalent.
2. A copy of the additional insured endorsements must accompany the insurance certificate. A copy of each of the endorsement are required. Additional insured primary and non-contributory, and waiver of subrogation..

E. The following additional requirements apply:

1. Contractor shall provide with the certificate, evidence of the amount of any deductible or self-insured retention under the policy.
2. It is the Contractor's responsibility to keep an up-to-date Certificate of Insurance on file with the City throughout the contract and must provide 30 day notice of any cancellation.

G. All Insurance coverage the Contractor is required to maintain under this Article shall be written on an "occurrence" basis and not on a "claims made" basis.

2.04 PAYMENT AND PERFORMANCE BONDS

Replace the entire Section 2.04 with the following City Supplemental Conditions:

A Performance Bond shall be obtained by the Contractor utilizing the form entitled "Performance Bond to the City of Tacoma" as found at the front of the Contract Document under "Contract Forms". Contractor shall provide a Performance Bond, including power of attorney, for 100 percent of the amount of his/her bid (including sales tax) per RCW 39.08 securing performance of work; all Contract obligations; materials, payment of laborers, Manufacturers and subcontractors.

In the event that the Contractor intends to have a subcontractor perform all or any 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:

D. The Contract amount is increased by 20% or more.

2.06 BUILDER'S RISK

Add Section 2.06.A with the following City Supplemental Conditions:

A. For projects not involving New Building Construction, 'Installation Floater' is an acceptable substitute for the Builder's Risk Insurance.

Add the following provisions Article B of Section 2.06 of Insurance and Bonds:

B. Reasonable compensation for A/E services and expenses required as a result of an insured loss shall not exceed \$300,000.00. Any deductible provision in the Builder's Risk Insurance will be paid for by the City, but shall not exceed \$10,000.00. Flood, earthquake, and terrorism insurance are not required under this Contract.

PART 3 TIME AND SCHEDULE

3.02 CONSTRUCTION SCHEDULE

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

C. Owner comments on Progress Schedule: Owner shall return comments on the preliminary Progress Schedule to Contractor within 3 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:

D. 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:

- PART 1 Actual starts and finishes of activities and changes in slack or float, lags and leads for each item;
- PART 2 Percent complete;
- PART 3 Changes in network logic.

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

- a. Problem areas; anticipated delay; and impact of these on Schedule.
- b. Report corrective action taken, or proposed, and its effect.
- c. 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 Contractors 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 or 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.

- D. 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").

- E. 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.
- F. 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 final 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.

- G. 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 final 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 final completion

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 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 2 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 7 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.

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. All documents must be received before contract is signed.

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 3 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 and submit through eBuilder as outlined in **Section 01 31 50 Web Based Construction Management**, 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:

- B. 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:
1. 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.
 2. 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.
 3. 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.
 4. Post all permits, notices, and/or approvals in a conspicuous location at the construction site.
 5. 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.
 6. All construction personnel shall wear highly visible reflective vests and hardhats while on North End Treatment Plant 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 2 Days 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 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.
 1. Tests and Inspections shall include the following minimum requirements:
 - a. Preparatory Inspection (pre-installation meetings): This shall be performed prior to beginning any work and shall include:
 - b. A review of applicable specifications;
 - c. A review of the Contract plans;
 - d. A check to assure that all materials and/or equipment have been tested, submitted and approved;
 - e. A check to assure that provisions have been made to provide control inspection and testing;
 - f. Examination of the work area to assure that all required preliminary work has been completed and is in Contract compliance;
 - g. 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;
 - h. Discussion of procedures for constructing the work, including repetitive deficiencies, construction tolerances and workmanship standards specified in the documents.
 - i. Initial Inspection: This shall be performed as soon as work begins on a definable feature of work and the following shall be accomplished:
 - j. A check of preliminary work to ensure that it is in Contract compliance and review of the preparatory meeting minutes;
 - k. Verification of full Contract compliance and verify that required control inspection and testing is underway;
 - l. Establish level of workmanship, verify that it meets minimum acceptable workmanship standards, and compare work with sample panels, etc., as appropriate;
 - m. Resolve all differences;
 - n. This inspection phase shall be repeated for each new crew on site performing the work, or any time standards are not being met.
 - o. 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.

p. Tests: All operation and acceptance tests, where specified, are to be performed to verify control measures are adequate.

q. 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 and submit to eBuilder as outlined in **Section 01 31 50 Web Based Construction Management**. 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:
 - e. 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.

Add Section 5.23 with City Supplemental Conditions:

5.23 ADJACENT PROPERTIES AND FACILITIES

- 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 calendar days) Contractor provide its own initial Punch List (List of Deficiencies) for the Owner's review. Owner 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 satisfactory 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 Contractors 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 7 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 Conditions:

- 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:

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:

- A. 1% for Contractor: For Contractor, 1% of direct labor costs.
- B. 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 7.02B 7a – 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, 7.02.D with City Supplemental Conditions:

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

Add Section 7.02.D 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. Within 7 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 30 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:

8. 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

P A R T I V

General Requirements and Technical Provisions

DIVISION 01 – GENERAL REQUIREMENTS

01 07 23	FIELD ENGINEERING
01 11 00	SUMMARY OF WORK
01 11 12	REFERENCE MATERIALS
01 14 01	ENVIRONMENTAL AND SUSTAINABILITY MANAGEMENT SYSTEM (ESMS)
01 29 73	SCHEDULE OF VALUES
01 29 76	PROGRESS PAYMENT PROCEDURES
01 31 50	WEB BASED CONSTRUCTION MANAGEMENT
01 32 10	CONSTRUCTION PROGRESS DOCUMENTATION
01 33 00	SUBMITTAL PROCEDURES
01 40 00	QUALITY CONTROL REQUIREMENTS
01 50 00	TEMPORARY FACILITIES AND CONTROLS
01 55 26	TRAFFIC CONTROL
01 60 00	PRODUCT SUBSTITUTIONS
01 73 24	DESIGN REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS AND NON-BUILDING STRUCTURES
01 74 19	MANAGEMENT AND DISPOSAL OF WASTE
01 78 00	CLOSEOUT PROCEDURES
01 78 39	PROJECT RECORD DOCUMENTS
01 91 00	COMMISSIONING

DIVISION 02 – EXISTING CONDITIONS

02 41 00	DEMOLITION
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DIVISION 03 – CONCRETE

03 30 31	CAST-IN-PLACE CONCRETE
03 45 00	PRECAST CONCRETE
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DIVISION 04 – MASONRY

04 22 00	CONCRETE UNIT MASONRY
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DIVISION 05 – METALS

05 05 14	HOT-DIP ZINC COATING
05 05 20	ANCHOR BOLTS
05 05 23	METAL FASTENINGS
05 07 00	DECORATIVE METAL PANEL
05 50 00	METAL FABRICATIONS

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 19 00	CLEAR WATER REPELLENTS
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07 90 00 JOINT PROTECTION

DIVISION 08 – OPENINGS

08 70 00 ENTRY HARDWARE

DIVISION 09 – FINISHES

09 24 23 CEMENT STUCCO
09 90 00 PAINTING AND COATING

DIVISION 26 – ELECTRICAL

26 05 00 COMMON WORK FOR ELECTRICAL SYSTEMS
26 05 01 BASIC MATERIALS AND METHODS FOR ELECTRICAL SYSTEMS
26 05 02 MINOR ELECTRICAL DEMOLITION
26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 23 CONTROL-VOLTAGE ELECTRICAL POWER CABLES
26 05 26 GROUNDING AND BONDING
26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
26 05 41 UNDERGROUND ELECTRICAL CONSTRUCTION
26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 08 00 COMMISSIONING OF ELECTRICAL SYSTEMS
26 24 16 PANELBOARDS
26 27 17 EQUIPMENT WIRING
26 27 26 WIRING DEVICES
26 28 13 FUSES
26 28 16 ENCLOSED SWITCHES
26 56 00 EXTERIOR LIGHTING

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 13 00 ACCESS CONTROL AND VIDEO MANAGEMENT SYSTEM

DIVISION 31 – EARTHWORK

31 11 00 CLEARING AND GRUBBING
31 13 00 SELECTIVE TREE AND SHRUB REMOVAL AND TRIMMING
31 20 00 EARTH MOVING
31 23 33 TRENCHING AND BACKFILLING

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 12 16 ASPHALT PAVING
32 16 13 CONCRETE CURBS AND GUTTERS
32 16 23 SIDEWALKS

32 16 33	DRIVEWAYS
32 17 23	PAVEMENT MARKINGS
32 31 24	ALUMINUM DOORS AND GATES
32 81 00	IRRIGATION
32 90 00	PLANTING

DIVISION 33 – UTILITIES

33 14 00	WATER UTILITY TRANSMISSION AND DISTRIBUTION
33 31 00	SANITARY SEWERAGE PIPING
33 42 00	STORMWATER CONVEYANCE

SECTION 01 07 23 FIELD ENGINEERING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section specifies requirements for construction surveying.

1.02 REFERENCE STANDARDS

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.01 CONTRACTOR SURVEYING

- A. The Contracting Agency shall provide construction surveying and has provided primary survey control in the Contract Drawings.
- B. The Contractor shall be coordinate with the Project Representative and provide 72-hour notice for any surveying requests.
- C. The Contractor shall inform the Project Representative when monuments are discovered that were not identified in the Plans and construction activity may disturb or damage the monuments. All existing monuments shall be protected throughout the length of the project or be replaced at the Contractors expense.

END OF SECTION

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SECTION 01 11 00 SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Summary of Work.
 2. Contractor's Use of Site.

1.02 SUMMARY OF WORK

The Project consists of centralizing trash collection and recycling at two existing recycling bins/compactor sites. New collection equipment - recycling bins and trash compactor(s) will be purchased under a separate Contract.

Work under this Contract include the following Sites and elements:

A. Site A – 801 South A Street

This is an existing facility with compactor, trash collection bin, fenced with chain link and slat enclosure. This facility is sandwiched between two parallel east-west sidewalks and located in the City of Tacoma Right of Way.

1. Expand footprint for a new enclosure, compactor, and recycling bins.
2. Replace existing fence enclosure CMU/decorative metal panel enclosure including, a service access swing gate, maintenance personnel access door and a public access door.
3. Water Service for wash down and repair of existing irrigation system.
4. Drainage for concrete pad and connection to existing sanitary sewer system.
5. Sidewalk, curb cuts, and ramps for maintenance access and ADA accessibility improvements.
6. Landscaping – Remove existing landscaping (shrubs, tree, stump) on Site A and adjacent site on Fireman's Park. Install new City-provided trees and planter restoration at Fireman's Park site. Save and protect existing adjacent tree.
7. Irrigation
 - a. Save and protect existing irrigation system to remain. Cut and cap as necessary to maintain existing irrigation system. If required, provide sleeving for any existing mainline within disturbance limits located under new pavement. Cut and cap lateral pipes affected by construction, reconnect and extend to remaining planter areas to provide full coverage for plant material.
 - b. Replace existing equipment with matching type and size (or resized as required for fully functioning system) and manufacturer.
8. Remove existing TPU electrical service and service entrance power panel and provide new TPU electrical service and service entrance power panel.

9. New electric service to power new trash compactor, site security and safety lighting, remotely monitored security cameras, and gate access control equipment.
10. Communications and access control cabinets to house, gate access controls, security camera systems, owner furnished Power over Ethernet (PoE) switch, firewall equipment and internet service modem.

B. Site B – 110 S 10th Street

This is an existing facility with compactor and trash collection bin, fenced with metal framed enclosure with chain link and slatting. The site currently has a drain system that is functional. This facility is between the sidewalks and located at the corner of a City of Tacoma owned parking garage building.

1. Modify footprint for a new enclosure, and compactor.
2. Replace existing fence enclosure with CMU/decorative metal panel enclosure including a service access swing gate and personnel/customer access door.
3. Sidewalk Patching.
4. Remove existing landscape, concrete planter, and irrigation system.
5. Disconnect existing trash compactor power circuit and extend to new trash compactor connection point.
6. Provide three additional 20-amp branch circuits from an existing power panel to provide power for new lights, gate access control and security camera equipment.
7. Communications and access control cabinets to house, gate access controls, security camera systems, owner furnished PoE switch, firewall equipment and internet service modem.

C. Contracting Method: The Work described in these documents will be constructed under a single prime construction contract with the City of Tacoma.

D. Project permits have been applied for and are in process at the time of issuance of the Request for Bid. Contractor may not begin any onsite work until all permits are received and Contractor is authorized to proceed with onsite work in writing by the City. Electrical permits shall be obtained by the electrical contractor.

E. This is a calendar day contract. See **Section 01 32 10 – Construction Progress Documentation** for calendar days set for this project.

1.03 CONTRACTOR'S USE OF SITE

- A. Contractors' use of the Site shall be confined to the areas shown on the Drawings.
- B. Move stored materials and equipment that interfere with operations of Owner, other contractors, and others performing work for Owner. The Owner's operations of solid waste collection at this location will be placed elsewhere during construction.

C. Limits on Contractor's use of the Site are:

1. As shown on the Drawings.
2. Do not use the Site for operations other than those required for the Project.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

END OF SECTION

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SECTION 01 11 12 REFERENCE MATERIALS

PART 1 GENERAL

1.01 SUMMARY

- A. The documents are available on e-Builder for this project.
- B. Reference documents are provided for informational purposes only and are not to be considered Contract Documents.
- C. For the Work related to the Contract, the following are considered reference documents:
 - 1. Compactor Pad – South 8th and Court A Plans
 - 2. “A” Street Garage – 10th and A Street Plans
 - 3. “A” Street Garage Expansion – 10th and A Street Plans

1.02 QUALITY ASSURANCE

(NOT USED)

1.03 SUBMITTALS

(NOT USED)

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

END OF SECTION

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SECTION 01 14 01 ENVIRONMENTAL AND SUSTAINABILITY MANAGEMENT SYSTEM (ESMS)

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 Projects including, but not limited to, the following:

PART 2 PRODUCTS - ESMS PROCEDURES.

2.01 REFERENCES

- A. Comply with requirements of Environmental and Sustainability Management Systems Sections 4.4.6-6 “Contractor Management Environmental Manual” and the “Contractor and Vendor Environmental and Sustainability Management System Information Sheet”.

2.02 DEFINITIONS

- A. Environmental and Sustainability Management System (ESMS) documents practices and procedures required by the Environmental Services Department to satisfy the requirements of ISO 14001 certification.

2.03 SUBMITTALS

- A. Contractor/Vendor Acknowledgement and Agreement
- B. ESMS Document 4.4.6.4 – Operational Control Environmental Checklist
- C. Based on the response to the completed checklist the Owner will decide the required training for those individuals from the Contractor expected to be on-site. At most this on-site training will be a maximum of 90 minutes.

PART 3 EXECUTION

3.01 THE CONTRACTOR IS RESPONSIBLE FOR PROPER COMPLETION AND SUBMISSION OF THE FOLLOWING, INCLUDING, BUT NOT LIMITED TO:

- A. Proper training of all employees in accordance with the training requirements, as per ESMS documents and procedures.
- B. Proper verification and completion of all forms listed under submittals in these specifications. Forms are required to be submitted prior to accessing the site.
- C. Notifications to the responsible ESMS on-site representative of planned activities and submission of any required on-site ESMS forms as may be required.

END OF SECTION



Verification	Originator	Revised	Approved	Issued
Initials	Core Team		Mgmt Rep	Mgmt Rep
Date	2/2019		2/2019	2/2019

ESMS Document – 8.1-5 Contractor Management Environmental Checklist

The following information is required by the Insert Name of Project Manager/Assigned Staff prior to contracted activity or service.

Check yes or no to identify which of the following will be included in the contracted activity or service.

Combustion Sources:

- Air heating and supply..... ☐ Yes ☐ No
- Mobile transportation (*i.e. forklift or carts*) ☐ Yes ☐ No
- Construction activities ☐ Yes ☐ No
- Excavation or grading ☐ Yes ☐ No
- Drilling or blasting ☐ Yes ☐ No
- Rock crushing ☐ Yes ☐ No
- Demolition ☐ Yes ☐ No
- Welding or soldering ☐ Yes ☐ No
- Painting ☐ Yes ☐ No
- Asphalt paving ☐ Yes ☐ No
- Use or storage of chemicals or fuels ☐ Yes ☐ No
- Transfer of bulk materials ☐ Yes ☐ No
- Disposal of chemical wastes ☐ Yes ☐ No

If yes, please describe waste streams:

Building Maintenance Activities:

- Architectural paint removal..... ☐ Yes ☐ No
- Architectural painting..... ☐ Yes ☐ No
- Hydroblasting ☐ Yes ☐ No
- Sandblasting ☐ Yes ☐ No
- Surface preparation/treatments (*i.e. floors and roof repair*)..... ☐ Yes ☐ No
- Purging or repair of distribution lines (*i.e. those for fuel, oil or solvents*) ... ☐ Yes ☐ No
- Use of chemicals, solvents, corrosives, acids, oils, etc..... ☐ Yes ☐ No
- Use of herbicides, pesticides, or insecticides ☐ Yes ☐ No

Business or Work Related Activities:

Use or receipt of chemical materials..... ☐ Yes ☐ No
(other than janitorial or cleaning materials)

Generation and disposal of chemical wastes..... ☐ Yes ☐ No

Generation of sealers, adhesives, coatings, or paints..... ☐ Yes ☐ No

Welding, soldering, brazing or similar activities ☐ Yes ☐ No

Use of caustics or acids ☐ Yes ☐ No

Use of combustion gases ☐ Yes ☐ No

If yes, please list the fuels used:

Laboratory installation ☐ Yes ☐ No

Medical waste ☐ Yes ☐ No

Discharge to storm drains ☐ Yes ☐ No

To be completed by the City of Tacoma, Project Manager or assigned staff prior to the contracted work or service.

A review of the above activities determined:

- ☐ No further action is required
- ☐ Contractor/supplier must refer to the project specification book/contract for the assigned operational controls

Signature:

Name, Title

Date

Refer to [8.1-2 Operational Planning and Control Contractor Management Procedure](#) and [8.1-3 Operational Planning and Control Vendor Procedure](#) for information regarding the use, routing and approval of this form.

Revision History

Change	Date of	Revised By	Summary of Changes
001			
002			

Previous versions or printed copies may be obsolete. Verify current versions using the ESMS website.



Contractor and Vendor Environmental and Sustainability Management System Information Sheet

Welcome. The City of Tacoma Solid Waste Management Division (SWM) operates an ISO 14001 Environmental and Sustainability Management System (ESMS). An ESMS is a process with procedures that will allow SWM to operate legally, safely, and efficiently while reducing the environmental impacts of our activities. All contractors and vendors are required to comply with the ESMS and Environmental Policy. As part of the ESMS SWM has identified the following Significant Environment Aspects:

- Potential Spills
- Fire Hazards
- Air Emissions

Contractors and vendors must ensure that their activities do not negatively affect the Significant Environmental Aspects.

All contractors and vendors are required to adhere to the following safety rules and requirements:

GENERAL SAFETY RULES

- Restricted Access – Contractors and vendors shall stay within the designated areas.
- Smoking – Smoking is prohibited in building and within 25 feet of windows and doors.
- Eye and Hearing Protection – Eye and hearing protection is required in designated areas.
- Accidents, near misses, and first aid – Contractors, truck drivers and visitors are required to report all accidents, near misses, and first aid incidents to City employees.
- Drugs and Alcohol – Alcoholic beverages and illicit drugs are prohibited on City property.
- Guns – Contractors are prohibited from carrying guns on City property.
- Emergency Procedures – Follow directions announced by City staff. To report a fire or emergency, contact any SWM employee.
- Vehicle Safety – Be aware and cautious of vehicle and pedestrian traffic.

CONTRACTOR REQUIREMENTS

Contractors are expected to understand and comply with all general federal, state, and local safety regulations and specific work practices applicable to the immediate project. These include, but are not limited to:

- Storage, handling and use of flammable liquids and hazardous materials.
- Periodic safety inspections and housekeeping.
- Use of all protection, if applicable.
- Following electrical safety practices and lock out/tag out procedures.
- Proper use of PPE.
- Proper maintenance and use of ladders and other equipment, if applicable.
- Contractors are responsible for removing and proper disposal of any hazardous materials or hazardous wastes utilized or generated while onsite at SWM.
- Contractors must notify the PM immediately of any leaks or spills.
- Requirements outlined in the signed contract or agreement to perform the contracted work.

Agreements acknowledging you have read and understood this information must be signed prior to starting work. It is the responsibility of the contracting company to ensure anyone working for or on their behalf adhere to these requirements Contractor/Vendor Acknowledgement and Agreement.

CONTRACTOR/VENDOR ACKNOWLEDGMENT AND AGREEMENT

Company Name: _____

The undersigned hereby acknowledges receiving the Contractor/Vendor informational materials for the City of Tacoma, Recovery and Transfer Center, Environmental and Sustainability Management System (ESMS). We further acknowledge having the responsibility to provide the training to all personnel who will be working on the property. We further agree to abide by all environmental regulations and policies whenever on the property. Sign-in sheets will be maintained as evidence that the ESMS training has been conducted and will be made available upon request. The Project Manager, primary City staff contact for the contract, or designee will communicate applicable changes to the ESMS to my company. Retraining of affected individuals will be conducted, as needed.

Contractor/Vendor Training Acknowledgment

Primary Company Contact: _____

Title: _____

Phone: _____ Fax: _____

Email: _____

Secondary Company Contact: _____

Title: _____

Phone: _____ Fax: _____

Email: _____

Signature

Date

For questions or additional information, contact the designated City contact as outlined in the contract.

SECTION 01 29 73 SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for the Schedule of Values.
- B. Scope:
 - 1. Contractor shall prepare and submit to Project Representative for acceptance a Schedule of Values that allocates cost to each item of the Work for which compensation is on a lump sum basis, Schedule of Value list of line items shall correspond to each aspect of the Work, establishing in detail the portion of the Contract Price allocated to each component of the Work.
 - 2. Upon request of Project Representative, promptly furnish data and information that substantiates and supports the amounts indicated in the Schedule of Values.
 - 3. Submit preliminary Schedule of Values to Project Representative for initial review. Contractor shall incorporate Project Representative's comments into the Schedule of Values and resubmit to Project Representative. Project Representative may require corrections and re-submittals until Schedule of Values is acceptable.
 - 4. Schedule of Values may be used as a basis for negotiating price of changes, if any, in the Work.

1.02 SUBMITTALS

- A. Informational Submittals: Submit the following:
 - 1. Submit to Project Representative the Schedule of Values in the form and quantity required in **Section 01 33 00 – Submittal Procedures**.
 - 2. Content of Schedule of Values Submittals shall be in accordance with Article 1.03 of this Specifications section.
 - 3. Timing of Submittals:
 - a. Submit preliminary Schedule of Values within time limit indicated in the General Conditions.
 - b. Submittal of the Schedule of Values for acceptance by Project Representative shall be in accordance with the General Conditions. Project Representative will not accept Applications for Payment without an acceptable Schedule of Values.
 - c. When required by Project Representative, promptly submit updated Schedule of Values to include cost breakdowns for changes in the Contract Price.

1.03 SCHEDULE OF VALUES FORMAT AND CONTENT

- A. Organization and Major Elements of Schedule of Values.
 - 1. Include in Schedule of Values itemized list of Work for each major work area included in the Work, for each lump sum payment item included in the Contract.
 - 2. Organization in Accordance with Specification Sections:
 - a. Within each work area, organize the Schedule of Values by the various Specifications section numbers and titles included in the Contract Documents.
 - b. Label each row in the Schedule of Values with the appropriate Specifications section number. Include an amount for each row in the Schedule of Values.
 - c. List sub-items of major materials, equipment, or systems, as appropriate or when requested by Project Representative.
- B. Requirements for preliminary Schedule of Values Submittal and the Schedule of Values Submittal for acceptance by Project Representative are:
 - 1. Subcontracted Work:
 - a. Schedule of Values shall indicate division of Work between Contractor and each Subcontractor.
 - b. Line items for Work to be performed by each Subcontractor shall include the word, "(SUBCONTRACTED)" and the name of the Subcontractor once the associated subcontract is signed and effective.
 - 2. Apportionment between Materials and Equipment, and Installation:
Schedule of Values shall include separate apportionment of costs for:
 - a. Cost of materials and equipment to be incorporated into the completed construction.
 - b. Cost of delivery, handling, and storage of materials and equipment to be incorporated into the completed construction.
 - c. Cost of temporary materials (such as excavation supports, scaffolding, and other temporary materials), and their associated delivery, handling, and storage costs, if any.
 - d. Cost of rentals of construction equipment and machinery, whether owned by Contractor or Subcontractor or leased from a third-party equipment rental entity.
 - e. Cost of installing materials and equipment.
 - f. Travel and subsistence costs, if any.
 - g. Other costs used in preparing the Bid by Contractor and each Subcontractor.
 - 3. Sum of individual line item amounts indicated on the Schedule of Values shall equal the total of associated bid/payment item. Sum of bid/payment item totals in the Schedule of Values shall equal the total lump sum component of the Contract Price.
 - 4. Overhead and Profit:
 - a. Include in each line item a directly proportional amount of Contractor's overhead and profit in the Contract Price.

- b. Do not include overhead and profit as separate line item(s).
- 5. Allowances: Include separate line item for each allowance.
- 6. Bonds and Insurance Costs:
 - a. When Contractor has furnished bonds and evidence of insurance acceptable to Owner and in accordance with the Contract Documents, entire amount for bonds and insurance may be applied for in the first Application for Payment.
- 7. "Site Overhead" and Administrative Cost Elements:
 - a. Include in the Schedule of Values relevant line items and amounts for work and services required by the General Conditions (Division 00) and specific Division 01 Specifications sections, such as:
 - 1) Superintendence and supervision costs and other costs.
 - 2) Itemized list of Work by work area, as applicable, for costs associated with coordination with the Owner's operations, including required sequencing, as set forth in the Contract Documents.
 - 3) Construction Progress Schedule.
 - 4) Permits (when applicable).
 - 5) Temporary utilities and temporary facilities.
 - 6) Field offices (monthly rental and maintenance) and storage facilities (excluding costs of establishment and removal, which are part of mobilization and demobilization).
 - 7) Site maintenance, such as temporary controls (dust, air pollution, water pollution, solid waste control, pest and rodent control, temporary erosion and sediment controls, and others), snow and ice removal, and similar activities.
 - 8) Field engineering and surveying.
 - 9) Record documents (preparation, maintenance, and submittal).
 - a) If adequate record documents are maintained, up to 50 PCT of the value of the record documents line item will be eligible for payment, spread evenly over those progress payments in which construction at the Site is performed.
 - b) Remainder of Project record documents line item will be eligible for payment when complete record documents are submitted in accordance with the Contract Documents. If record documents submitted are unsatisfactory to Project Representative, amount may be reduced via set-offs in accordance with the Contract Documents.
 - 10) Other items required by Project Representative.
 - b. Include such items in Applications for Payment on payment schedule acceptable to Project Representative.
 - c. Such line items in the Schedule of Values shall exclude any and all costs associated with Contractor's permanent place(s) of business, personnel stationed at permanent office(s), salaries and bonuses of executive and administrative personnel not directly performing work on the Project, and general business expenses, all of which are part of Contractor's overhead costs.

8. Mobilization and Demobilization:
 - a. Include separate line items under each appropriate lump sum bid/payment item for mobilization and demobilization.
 - b. Document for Project Representative the activities included in mobilization and demobilization line items.
 - c. Mobilization includes: obtaining permits; negotiating, preparing, and signing subcontracts and purchase orders, attending preconstruction conference(s) and initial scheduling conference(s); establishing temporary utilities and temporary facilities; establishing field offices, storage sheds, and staging and laydown areas; establishing major temporary equipment and machinery at the Site; establishing temporary access roads and parking; preparing and initial implementation of spill prevention control and countermeasures plans; initial establishment of temporary environmental controls, including initial temporary erosion and sediment controls; and similar work required for Contractor to mobilize for Work at the Site, not included under other line items of the Schedule of Values. Obtain Project Representative's concurrence for other costs included under mobilization.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 29 76 PROGRESS PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for Contractor's progress payments.
- B. Scope:
 - 1. Contractor's requests for payment shall be in accordance with the Agreement, General Conditions and Supplementary Conditions, and the Specifications.
 - 2. Form: Applications for Payment shall be the AIA Form G702/G703 or other form acceptable to the Owner and Project Representative.

1.02 CONTENT AND PROCEDURE FOR REQUESTING PROGRESS FOR PAYMENTS

- A. Procedure:
 - 1. Review with Project Representative quantities and the Work proposed for inclusion in each progress payment request. Application for Payment shall cover only the Work and quantities recommended by the Project Representative.
 - 2. Contractor will review with Project Representative the status of Project record documents, in connection with Project Representative's review of each Application for Payment. Failure to maintain record document current will be cause for Project Representative to recommend a reduction in payment for record documents in accordance with **Section 01 29 73 - Schedule of Values**, and will entitle Owner to set-offs in accordance with the Contract Documents.
 - 3. Submit to Construction Manager electronic originals, each with Contractor's signature, of each complete Application for Payment and other documents to accompany the Application for Payment.
 - 4. Project Representative will act on request for payment in accordance with the General Conditions and Supplementary Conditions.
- B. Content: Each request for payment shall include:
 - 1. Completed Application for Payment form, including summary/signature page, progress estimate sheets, and stored materials summary. Progress estimate sheets shall have the same level of detail as the Schedule of Values.
 - 2. Documentation for Stored Materials and Equipment:
 - a. For materials and equipment not incorporated in the Work but suitably stored, submit documentation in accordance with the General Conditions and Supplementary Conditions.

- b. Legibly indicate on invoice or bill of sale the specific stored materials or equipment included in the payment request and corresponding bid/payment item number for each and the Supplier price for each item.
- 3. Listing of Subcontractors and Suppliers:
 - a. In accordance with the General Conditions, submit not less than monthly updated listing of all Subcontractors and Suppliers known to Contractor, whether or not such entities have a contract directly with Contractor.
 - b. Submit complete information using the form attached to this Specifications section.
- 4. Partial Release or Reduction of Retainage:
 - a. For each Application for Payment where Contractor requests partial release or reduction of retainage in any amount (other than request for final payment), submit with associated progress payment request consent of surety to partial release or reduction of retainage, duly completed by Contractor and surety.
 - b. Acceptable form includes AIA G707A, "Consent of Surety to Reduction in or Partial Release of Retainage" (1994 or later edition), or other form acceptable to Owner.
 - c. For payment requests that include reduction in or payment of retainage in an amount greater than that required by the Contract Documents, obtain Owner's concurrence for partial release or reduction in retainage prior to submitting such Application for Payment.

C. Final Payment:

- 1. Requirements for request for final payment are in the General Conditions, as may be modified by the Supplementary Conditions, and **Section 01 78 00 – Closeout Procedures**.

1.03 ADDITIONAL PROCEDURES FOR PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Observation of Stored Materials and Equipment as Condition Precedent to Eligibility for Payment:

- 1. General:
 - a. Prior to materials or equipment suitably stored but not yet incorporated into the Work can be eligible for payment, Project Representative shall visit the storage location and verify the extent, condition, and storage environment of the stored items.
 - b. When the same material or equipment item is stored for more than two months, such visits to storage location shall be not less than once every two months.
- 2. Cost Responsibility for Observations:
 - a. When storage location is less than 20 miles from the Site or less than 20 miles from Project Representative's office, Contractor is not responsible for reimbursing Owner for cost of Project Representative's time and expenses for observing stored materials and equipment.
 - b. When storage location is more than 20 miles from the Site and more than 20 miles from Project Representative's office, Contractor shall reimburse Owner, via a set-off under the Contract Documents, for reasonable cost of Project Representative's time and expenses,

including travel time, to visit the storage location and observe the stored materials and equipment.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.01 ATTACHMENTS

- A. The forms listed below, following this Specifications section's "End of Section" designation, are part of this Specifications section:
 - 1. List of Subcontractors and Suppliers form (two pages).

END OF SECTION

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LIST OF SUBCONTRACTORS AND SUPPLIERS

Owner: _____

Project Name: _____

Contractor: _____ Date: _____

Contract Designation: _____

Indicate below complete information for each Subcontractor and Supplier known to Contractor, regardless of whether the firm has a direct contract with Contractor. Include all lower-tier Subcontractors and associated Suppliers. Copy and paste the paragraphs below as required to indicate all Subcontractors and Suppliers.

SUBCONTRACTORS

1. Subcontractor Name:

- Address:
- Contact Person:
- Telephone No.:
- E-mail Address:
- Work Under Specifications Section Nos.:
- Brief Description of Work:
- Current Subcontract Price:
- Approximate Subcontract Start Date:
- Approximate Subcontract End Date:

2. Subcontractor Name:

- Address:
- Contact Person:
- Telephone No.:
- E-mail Address:
- Work Under Specifications Section Nos.:
- Brief Description of Work:
- Current Subcontract Price:
- Approximate Subcontract Start Date:
- Approximate Subcontract End Date:

3. Subcontractor Name:

- Address:
- Contact Person:
- Telephone No.:
- E-mail Address:
- Work Under Specifications Section Nos.:
- Brief Description of Work:
- Current Subcontract Price:
- Approximate Subcontract Start Date:
- Approximate Subcontract End Date:

Total of Subcontract Prices for all subcontracts equals approximately ____ percent of the Contract Price (*Contractor to fill in blank monthly*)

SUPPLIERS

1. Supplier Name:

- *Address:*
- *Contact Person:*
- *Telephone No.:*
- *E-mail Address:*
- *Furnishing Items Under Specifications Section Nos.:*
- *Brief Description of Items:*
- *Current Purchase Order Amount:*
- *Approximate Purchase Order Date:*
- *Approximate Purchase Order End Date:*

2. Subcontractor Name:

- *Address:*
- *Contact Person:*
- *Telephone No.:*
- *E-mail Address:*
- *Furnishing Items Under Specifications Section Nos.:*
- *Brief Description of Items:*
- *Current Purchase Order Amount:*
- *Approximate Purchase Order Date:*
- *Approximate Purchase Order End Date:*

3. Subcontractor Name:

- *Address:*
- *Contact Person:*
- *Telephone No.:*
- *E-mail Address:*
- *Furnishing Items Under Specifications Section Nos.:*
- *Brief Description of Items:*
- *Current Purchase Order Amount:*
- *Approximate Purchase Order Date:*
- *Approximate Purchase Order End Date:*

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 32 10 – Construction Progress Documentation**
 - 2. **Section 01 33 00 – Submittal 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.
- B. 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.
- C. Purpose: The intent of using Internet web based project management software is to improve project work efforts by promoting timely initial communications and responses.
- D. 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.
- E. Administrative Users: Administrative users have access and control of user licenses and all posted items. **DO NOT POST PRIVATE ON YOUR 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).
- F. 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 YOUR 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.

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 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 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 his representatives, the Construction Manager and his representatives, the Engineer and the consultants, and the Contractor shall respond to documents received in electronic form through the web site, and consider them as if received in paper document form.
 - b. The City and his representatives, the Construction Manager and his representatives, the Engineer and the consultants, and the Contractor 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.
 - c. The City and his representatives, the Construction Manager and his representatives, the Engineer and the consultants, and the Contractor reserves the right to and shall copy any paper document into electronic form and make same available on the web site.
 - d. The following are some but not all of the paper documents which require original signature:
 - 1) Contract
 - 2) Change Orders
 - 3) Application & Certificates for Payment
- 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. If the submittal lacks signature and stamp of engineer it will be returned not reviewed.
- 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 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. As-built drawings: Final documents shall be submitted as specified.
 - c. Extra materials, spare stock, etc.: Submittal forms shall indicate when actual materials are submitted.

J. All additional submittals as required by the Construction Manager for the Project.

3.02 FINANCIAL SUBMITTALS

- A. Schedule of Values, Pay Estimates and Change Request Proposals shall be submitted on e-Builder. Supporting material for Pay Estimates and Change Requests shall be submitted on e-Builder as PDF attachments. Examples of compliance submittals include, but are not limited to:
 - 1. Contractors Schedule of Values.
 - 2. Contractors Monthly Progress Payment Requests.
 - 3. Contract Change Proposals requested by the project City.
 - 4. Cash Flow analysis.
- B. Contractor shall refer to Division 00 and other Sections of Division 01 for requirements for pay applications, change proposals and schedule of value requirements.

END OF SECTION

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SECTION 01 32 10 CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Specific requirements for the preparation, submittal, updating, and status reporting of the construction Progress Schedule.
- B. Related Specification Sections include, but are not necessarily limited to:
 - 1. **Division 00 – General Conditions**
 - 2. **Division 01 – General Requirements**
- C. Review of the CPM Schedule:
 - 1. In so far as the Contractor is solely responsible for its means and methods and the CPM schedule represents in part its means and methods, the review of the CPM schedules (preliminary, baseline, updates, revisions, etc.) is for compliance with the requirements as defined in the contract documents.
 - 2. The review of the CPM schedule is not intended to be complete or exhaustive or check every activity and its relation to the work.
 - 3. The Project Representative will provide comments on the CPM schedule compliance with those contract requirements and anomalies that might appear to the Project Representative.
 - 4. If the Contractor fails to include contract requirements (e.g. specified cure times, commissioning periods) in the CPM schedule, or the Project Representative fails to notify the Contractor of anomalies the Contractor is not relieved of the contract requirements.
 - 5. Review of the CPM schedule does not imply that the Owner has approved or accepted the Contractor's means and methods or sequence for performing the work to construct the project.
 - 6. If the Contractor has questions or concerns about comments, the Contractor and Project Representative shall meet to resolve those issues prior to issuance of future updates or revisions.

1.02 DEFINITIONS

- A. The following definitions shall apply to this Specification Section:
 - 1. Execution of The Contract: The date the contract is signed by the last party, either the Owner or the Contractor.
 - 2. Calendar Days: Monday through Friday except holidays as directed by the Owner.
 - 3. This is a calendar day contract. The calendar days set for this project are 225 days.

4. Earthwork shall not commence until 90 days after issuance of Notice to Proceed to allow for procurement of electrical equipment and to minimize disruption to adjacent businesses.
5. Preliminary Schedule: A schedule showing detailed activity for the first 30 days of the Project, and a general work plan for construction activity from the 31st day until the Contractual Completion Date.
6. Baseline Schedule: The initial detailed Progress Schedule prepared by the Contractor defining its plan for constructing the Project in accordance with the Contract Documents.
7. Schedule Update: The initially reviewed Baseline Schedule, or subsequently reviewed Revised Baseline Schedules, updated each month to reflect actual start and finish dates of each schedule activity and the remaining duration of activities that began during the period.
8. Current Schedule: The current schedule is either the Baseline Schedule or Revised Baseline Schedule including and incorporating Schedule Updates.
9. Revised Baseline Schedule: The initially reviewed Baseline Schedule revised to reflect approved contract change orders and modifications.
10. Recovery Schedule:
 - a. A schedule indicating the Contractor's plan for recovering lost time.
 - b. A recovery schedule will be requested when the Contractor is forecasting at least 10 working days or more delays in meeting a contract milestone or the contract completion date.
11. Short Interval Schedule:
 - a. Schedule prepared by the Contractor reflecting the work planned for the coming weeks.
 - b. This is also known as a Look-Ahead Schedule.

1.03 SUBMITTALS

A. Procedures: **Section 01 33 00 – Submittal Procedures**

1. Submittal package:
 - a. Provide a detailed plan for the first 90 days of the project and summary activities of the work to achieve the project milestones.
 - b. CPM time-scaled network diagram:
 - 1) A printed logic diagram and PDF that include the following information:
 - a) Unique activity number/identifier; numeric, alpha or combination of numeric/alpha.
 - b) Activity description.
 - c) Activity duration.
 - d) Early start and early finish for each activity.
 - e) Late start and late finish for each activity.
 - f) Total float (TF) for each activity.
 - g) Predecessor activities.
 - h) Successor activities.
 - i) Bar showing the early start and completion dates of each activity.
2. The activities will be sorted by area, trades, and subcontractors as agreed on with the Project Representative.

3. Printable CPM time-scaled network diagram on minimum sheet size of 11 IN x 17 IN.

B. Baseline Schedule:

1. Submittal and review:
 - a. Submit within 10 days after Execution of the Contract or the effective date of the contract, whichever is earlier.
 - b. The Project Representative shall review the baseline schedule and provide comments to the Contractor within 10 working days after receipt of the schedule.
 - c. After receiving comments, the Contractor and Project Representative shall meet to review the comments within 5 working days.
 - d. After the meeting, the Contractor will modify the schedule as agreed and resubmit the baseline schedule within 5 working days.
 - e. After the Project Representative confirms that the Contractor has made the changes as agreed, the schedule will become the baseline schedule.
2. Submittal package:
 - a. CPM time-scaled network diagram:
 - 1) A printed logic diagram and PDF that include the following information:
 - a) Unique activity number/identifier; numeric, alpha or combination of numeric/alpha.
 - b) Activity description.
 - c) Activity duration.
 - d) Early start and early finish for each activity.
 - e) Late start and late finish for each activity.
 - f) Total float (TF) for each activity.
 - g) Predecessor activities.
 - h) Successor activities.
 - i) Cost/budget to complete the work in the activity.
 - j) Resources needed to complete the activity.
 - k) Bar showing the early start and completion dates of each activity.
 - 2) The activities will be sorted by area, trades, and subcontractors as agreed on with the Project Representative.
 - 3) Printable CPM time-scaled network diagram on minimum sheet size of 11 IN x 17 IN.

C. Schedule Updates:

1. Submittal and Review:
 - a. Provide a Schedule Update on the 4th of each month after the Baseline Schedule is completed.
 - b. The Project Representative shall provide comments to the Contractor on the Schedule Update.
 - c. Incorporate the Project Representative comments into the next Schedule Update.
2. CPM time-scaled network diagram as described for the Baseline Schedule:
 - a. Do not change the description of an activity number.

- 1) Any activity added to the schedule shall have a new unique activity number and description.
- 2) If activities are deleted, the deleted activity number(s) will not be used again.

D. Recovery Schedule:

1. When the activities on the critical path or the completion milestones appear to be 15 working days beyond the contract time, the Project Representative may request and provide a Recovery Schedule demonstrating how the Contractor will recover the lost time so that the Work will be completed within the Contract Time.
2. Provide the Recovery schedule within 10 working days after requested by the Project Representative.
3. Activities will be added or the durations modified to reflect the changes to the work.
4. The Project Representative will review and provide comments to the Contractor on the Recovery Schedule within five working days.
5. Incorporate the Project Representative comments into the Recovery Schedule.
6. After acceptance by the Project Representative, the Recovery Schedule use for future Schedule Updates.
7. CPM time-scaled network diagram as described for the Baseline Schedule:
 - a. Do not change the description of an activity number.
 - 1) Any activity added to the schedule shall have a new activity number and description.
 - 2) If activities are deleted, the deleted activity number(s) will not be used again.
8. Provide a narrative with an explanation of the changes in logic and/or activity durations.

E. Short Interval Schedule:

1. Provide a four-week schedule each week during the Contract Time. This schedule can be reviewed at each progress meeting.
 - a. Provide an accurate representation of the work performed the previous week and work planned for the current week and subsequent three weeks.
2. Provide in a tabular format with bars or other graphic representing work duration.
 - a. Reference activity ID numbers on the Baseline, Revised Baseline, or Updated Schedule, whichever is being currently used.
 - b. Note by color, highlight or underscore all activities on the critical path.
3. Identify inspection hold points including special inspections needed before the Contractor can move forward with the work.
4. Identify the day materials provided by the Owner or others needed on site.
5. Identify utility tie-ins and traffic changes including road and/or lane closures.

1.04 GENERAL REQUIREMENTS

- A. Prepare and submit construction progress schedules as specified herein.
 - 1. Develop and maintain Baseline, Updates and Recovery schedules using Microsoft Project or equal as approved by the Project Representative.
 - 2. Include the following information:
 - a. Construction start dates (Award date, Notice(s) to Proceed date).
 - b. Procurement activities.
 - c. Preparation of key submittals for materials and equipment.
 - d. Project Representative's review and approval of key submittals.
 - e. Material and equipment fabrication lead times.
 - f. Material and equipment deliveries.
 - g. Curing of concrete after placement for all structures.
 - h. Shutdowns.
 - i. Utility tie-ins.
 - j. Plant tie-ins.
 - k. Traffic changes and closures.
 - l. Inspections and hold points.
 - m. Start-up of equipment.
 - n. Testing of equipment and systems.
 - o. Training
 - p. Commissioning.
 - q. Contract milestones:
 - 1) Intermediate milestones.
 - 2) Substantial Completion Date.
 - 3) Physical Completion Date.
 - 3. The following CPM schedule outputs will be rejected without further review:
 - a. Schedules indicating the start of the critical path at a date point or activity beyond the date of Notice to Proceed, or schedules indicating a discontinuous critical path from Notice to Proceed to Contract completion.
 - b. Schedules defining critical activities as those on a path or paths having some minimum value of float.
 - c. Schedules with multiple critical paths.
 - d. Schedules indicating a completion date beyond the contractual completion date.
- B. The number of activities shall be sufficient to assure adequate planning of the project, to permit monitoring and evaluation of progress, and to do an analysis of time impacts.
 - 1. Work activities shall not exceed durations of 10 days or two weeks.
 - a. Procurement and fabrication activity durations may exceed 10 days or two weeks.
 - 2. Schedule activities shall include the following:
 - a. A clear and legible description.
 - b. At least one predecessor and one successor activity, except for project start and finish milestones.
- C. Early Completion Schedule:

1. Contractor may show early completion time on any schedule provided that the requirements of the contract are met.
2. Contractor may increase early completion time by improving production, reallocating resources to be more efficient, performing sequential activities concurrently or by completing activities earlier than planned.
3. Any time between the Contractor's early completion and the Contract Time will be considered float.

D. Plan working durations to incorporate the effects of normal weather impacts.

E. Float:

1. The project owns the float, therefore neither the Owner nor the Contractor has exclusive use of the float; the float can be used by either party.
2. Once float is used, liability for delay of the project completion date rests with the party actually causing delay to the project completion date.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 33 00 SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies procedures and requirements for all submittals, substitutions, deviations, and the Master Submittal List required by the Specifications.
- B. Submittals shall be accompanied by a Submittal Form.
- C. No fabrication or construction work shall occur on a specific submittal item without a submittal Review Action of Reviewed (No Comments) or Reviewed with Comments. Any procurement or construction activity undertaken by the Contractor absent such a submittal Review Action will not be progress on project schedule or schedule of values.
- D. Unless specified otherwise in this Contract, preparation, and revisions of submittals is to be an incidental expense and not a pay item.
- E. Review of submittals shall not relieve the Contractor of its responsibility for errors or omission therein and shall not be regarded as an assumption of risks or liability by the City.

1.02 MASTER SUBMITTAL LIST

- A. Prepare and submit within 30 days after the effective date of the Notice-to-Proceed, a Master Submittal List listing of all items for which submittals are required by the Specifications. Organize the Master Submittal List by Specification Section number and include the following information for all listed items:
 - 1. Item identification
 - 2. Specification Section number
 - 3. Planned submittal date
 - 4. Identification of those items that are substitutions or contain deviations from the Specifications.
 - 5. Identification of those items that require other jurisdictional agency review and approval.
 - 6. The list shall include columns for future use as information becomes available for the following items:
 - a. Trade name, model, and catalog designation.
 - b. The scheduled need dates for control purposes.
 - c. Date submitted.
 - d. The date approval is needed.
 - e. The date on which material is needed.

- B. Provide monthly updated Master Submittal List.
- C. Provide final and fully completed Master Submittal List prior to Substantial Completion.

1.03 CONTRACTOR RESPONSIBILITIES

- A. Be responsible for the accuracy and completeness of the information contained in each submittal. The cost to review the initial submittal and the first revised submittal shall be borne by the City.
- B. In addition to submittals required by individual Section specifications, submit information on items shown on the Drawings but not specified; and include proof of Professional Liability insurance for Work, which requires, either by Law or by Contract, the Submittal to be stamped by a licensed professional.
- C. Submit information on all repair and corrective work required of or generated by the Contractor such that the acceptability of the quality of the repair or correction can be assessed before it is performed.
- D. Submit descriptive information that will enable the Project Representative to assess whether the proposed materials, equipment, or methods of work are in general conformance with the Work and in compliance with the Contract.
- E. Specifically identify and annotate any deviation or substitutions in the Submittal Form. If deviations or substitutions are not clearly identified or annotated, the original contract provisions shall prevail; if the item has been installed without specific acceptance of the deviation or substitution it shall be removed and the contract required item installed in its place.
- F. Coordinate and integrate all submittal dates with the Baseline Schedule and Master Submittal List.
- G. Ensure coordination of submittals among the suppliers, related crafts, subcontractors, and with the planned work. The Contractor will be held responsible for any cost or schedule impact caused by a submittal coordination failure.
- H. Submit a request for all pre-bid and post-bid substitutions using **Substitution Request Form Section 01 60 00 – Product Substitutions**.
- I. Document all deviations from the Contract on the Submittal Form transmitted to Project Representative and note where applicable in the body of the submittal.

1.04 SUBMITTALS ON ITEMS DIFFERING FROM THAT REQUIRED BY THE CONTRACT DOCUMENTS

- A. To be submitted during bid process, unless in exceptional cases as defined in **Section 01 60 00 – Product Substitutions**.
- B. Approved Equal:
1. Definition: An item of material or equipment proposed by the Contractor that has the same function, quality, durability, appearance, strength, and design characteristics equal to that named, that meets the requirements of the Specification, and is sufficiently similar so that no change in related work is required. The item of material or equipment shall reliably perform at least equally well for the function imposed by the design concept of the completed work as a functioning whole. In general, approved equal applies to manufactured items.
 2. Clearly note on the Submittal Form if any items are submitted as an equal
 3. Acceptance is at the Project Representative's sole discretion and the decision regarding acceptance or rejection shall be final. If the Contractor disagrees, a Request for a Change Order shall be filed in accordance with contract provisions. Do not assume acceptance at any time prior to the rendering of decision by the Project Representative.
- C. Substitution:
1. Definition: An item of difference in materials, equipment, means, method, technique, dimension, sequence, or procedure which functionally meets the Contract requirements, but does not meet the Specification(s) and is equal to or better than the specified item.
 2. Substitutions requested by the Contractor shall conform to the requirements of **Section 01 60 00 – Product Substitutions**. A submittal shall be provided for each substitution request, must be submitted using Substitution Request Form, and shall address all items on the form. The request shall include complete specifications or means and methods for the item including procurement, operational and maintenance cost data. Substitution Request forms shall be numbered sequentially beginning with the number No. 1.
 3. Any Substitution not identified on a submittal is not accepted or approved regardless of any action taken on the submittal by the City. Action taken by the City on the submittal shall not relieve the Contractor from complying with the original Contract requirements.
 4. Acceptance is at the Project Representative's sole discretion and the decision regarding acceptance or rejection of the substitution shall be final. If the substitution is rejected, proceed with the contract specifications without delay. Do not assume acceptance at any time prior to the rendering of a written decision by the Project Representative.
- D. Deviations:
1. Definition: A minor change or omission to a specified material, procedure or product proposed by the Contractor that does not fully conform to the

- requirements specified, but conforms to dimensional, operational, and maintenance requirements and can be shown to accomplish the functional and operational and maintenance performance of the specified item.
2. Annotate in the submittal all deviations from stated requirements in the Contract. Any deviation not identified on the submittal is not accepted or approved regardless of any subsequent action on the submittal by the City. Failure of the City to comment on the deviation shall not relieve the Contractor from complying with the original Contract requirements.
 3. Acceptance is at the Project Representative's sole discretion and the decision regarding acceptance or rejection shall be final. Do not assume acceptance at any time prior to the rendering of a decision by the Project Representative.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.01 TRANSMITTAL PROCEDURE

A. General:

1. Submittals shall be transmitted via **e-Builder ASP Software Section 01 31 50 – Web Based Construction Management**
2. Submittals shall be accompanied by a Submittal Form and include all submittal materials.
3. A separate form shall be used for each specific item, class of material, equipment, and items specified in separate, discrete sections for which a submittal is required.
4. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review the group or package as a whole.
5. No multiple-Section submittals will be allowed except where previously approved by the Project Representative and as indicated on the Master Submittal List.
6. A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted. Original submittal numbers shall have the following format: "XXX"; where "XXX" is the sequential number assigned by the Contractor. Resubmittals shall have the following format: "XXXY"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for re submittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 25B, for example, is the second resubmittal of Submittal 25.
7. Submit all proposed approved equals as a part of the submittal process.
8. All paper documents submitted by the Contractor shall be in accordance with the City of Tacoma's Sustainable Purchasing Policy (Resolution 38248). Documents shall be produced on recycled paper containing the highest level

of post-consumer and recycled content available. At a minimum, paper with 30 percent post-consumer recycled content shall be used.

- B. Submittal format:
 - 1. PDF shall be the default submittal format. PDF documents shall be bookmarked and searchable PDF files.
 - 2. When other native files are required, such as Excel, AutoCAD, or other specialty program formats, these shall be transferred electronically in the same manner as the PDFs.
 - 3. Links to online documents or web sites shall not be allowed.
- C. Samples: Submit the number requested in the Specification Section with the Submittal Form. Product samples and color samples shall not be transmitted electronically. Samples will not be returned.
- D. Certificates: Will be considered as information. No response will be provided by the City.
- E. "Submit for information only." No response will be provided by the City.

3.02 REVIEW PROCEDURE

- A. The returned submittal will indicate one of the following actions:
 - 1. Reviewed (no Comments):
 - a. Contractor may proceed with the work described in the submittal.
 - 2. Reviewed with Comments:
 - a. Contractor shall incorporate all review comments into the work, but resubmittal of an amended submittal package is not required.
 - b. Resubmit only the portion of package necessary to respond to Owner's comments
 - 3. Amend and Resubmit:
 - a. Contractor shall incorporate the review comments into a complete revised package, and resubmit it for review.
 - 4. Rejected:
 - a. Contractor shall review comments.
 - b. Contractor shall develop a new submittal package with materials, equipment, methods, etc. that meet the requirements of the Contract Documents.
- B. Contractor: Prepare resubmittal, if applicable:
 - 1. Clearly identify each correction or change made.
 - 2. Include a response in writing to each of the Owner's comments or questions for submittal packages that are resubmitted in the order that the comments or questions were presented throughout the submittal:
 - a. Acceptable responses to Owner's comments are listed below:
 - 1) "Incorporated" Owner's comment or change is accepted and appropriate changes are made.

- 2) "Response" Owner's comment not incorporated. Explain why comment is not accepted or requested change is not made. Explain how requirement will be satisfied in lieu of comment or change requested by Owner.
- b. Any resubmittal that does not contain responses to the Owner's previous comments shall be returned "Revise and Resubmit". No further review by the Owner will be performed until a response for previous comments has been received.
3. Review costs:
 - a. Costs incurred by Owner as a result of additional reviews of a particular submittal after the second time it has been reviewed shall be borne by Contractor.
 - b. Reimbursement to Owner will be made by deducting such costs from Contractor's subsequent progress payments.

3.03 ATTACHMENTS

- A. The form listed below following this specification section's "End of Section" designation, is part of this Specifications Section.
 1. Submittal Review Comments

END OF SECTION



City of Tacoma
Environmental Services Department
Science and Engineering Division

SUBMITTAL REVIEW

Project/Spec No.: ENV-00116-04-06 / ES22-0204F
Project Name: SWM Downtown Compactor Enclosure Upgrade Project
Submittal Number:
Spec Section:
Description:
Date Submitted:
Response Date:

SUBMITTAL REVIEW ACTION (select one)

The Engineer's review of drawings and data submitted by the Contractor will cover only general conformity with the contract drawings and specifications. The Engineer's review of submittals shall not relieve the Contractor from responsibility for errors, omissions, deviations, or responsibility for compliance with the contract.

A	Reviewed (no Comments): Contractor may proceed with the work described in the submittal.
B	Reviewed with Comments: Contractor shall incorporate all review comments into the work, but resubmittal of an amended submittal package is not required. Resubmit only the portion of package necessary to respond to Owner's comments.
C	Amend and Resubmit: Contractor shall incorporate the review comments into a complete revised package, and resubmit it for review.
D	Rejected: Contractor shall review comments. Contractor shall develop a new submittal package with materials, equipment, methods, etc. that meet the requirements of the Contract Documents.

COMMENTS:

No.	Reviewer	Pg./Sheet/ Spec #	Comment
1.			
2.			
3.			

Date: _____ By: _____

CITY OF TACOMA

SECTION 01 40 00 QUALITY CONTROL REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. This section specifies administrative and procedural requirements for quality assurance and control services, special inspections, field testing and structural observations required for this project. This Section is supplementary to testing and inspection specified elsewhere in the Contract, and describes the responsibilities of all parties pertaining to testing and inspections.
- B. This section covers requirements for quality assurance and inspection required in accordance with **Section 110 and Chapter 17 of the International Building Code, 2018 edition**, and is in addition to and supplements the quality assurance requirements contained on the Contract Drawings.
- C. The Contractor is responsible for providing quality workmanship and materials for the construction of this project in accordance with the Contract Documents.
- D. The Owner will engage and pay for the services of a Special Inspector. The Special Inspector shall be qualified to the satisfaction of the Building Official in accordance with Chapter 17 of the International Building Code. The Special Inspector shall be acceptable to the Owner in its sole discretion.

1.02 DEFINITIONS

- A. Approved Agency: An agency approved by the Building Official to engage in furnishing testing or inspection services.
- B. Certificate of Compliance: A certificate stating that materials and products meet specified standards or that work was performed in compliance with approved construction documents.
- C. Registered Design Professional in Responsible Charge: An architect or engineer, licensed to practice in the State of Washington, acting as the Owner's agent.
- D. Special Inspection: Inspection of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards.
- E. Special Inspection, Continuous: The 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.

- F. Special Inspection, Periodic: The part-time or intermittent observation of work requiring special inspection by an approved Special Inspector who is present in the area where the work is being performed and at the completion of the work.
- G. Special Inspector: A qualified person who has demonstrated competence, to the satisfaction of the Building Official, to perform inspection of the particular type of construction or operation requiring special inspection.
- H. Statement of Special Inspections: The quality assurance plan contained on the contract drawings establishing the systems and components subject to special inspection and testing, as well as the frequency of testing and extent and duration of the special inspection.
- I. Structural Observation: The visual observation of the structural system by a registered design professional for general conformance to the approved construction documents at significant construction stages and at completion of the structural system.

1.03 REFERENCES

- A. 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.

REFERENCE	TITLE
ASCE 7-05	Minimum Design Loads for Buildings and Other Structures
ASTM E329	Practice for Use in Evaluation of Inspection and Testing Agencies as Used in Construction
AWS D1.1	Structural Welding Code – Steel
AWS D1.2	Structural Welding Code – Aluminum
AWS D1.3	Structural Welding Code – Sheet Steel
AWS QC 1	Standard for AWS Certification of Welding Inspectors IBC International Building Code, 2018
ICC-ES	International Code Council – Evaluation Service Reports and Legacy Reports

1.04 SUBMITTALS

- A. The following information shall be provided in accordance with **Section 01 33 00 – Submittal Procedures**:
1. Fabricator Approval: Certification showing that fabricator is registered and approved to perform shop fabrication without special inspection.
 2. Certificates of Compliance: Certificates of compliance shall be submitted stating that materials and products meet specified standards.
 3. Contractor Statement: Prior to start of construction, Contractor shall submit statement of responsibility containing the following:
 - a. Acknowledgement of awareness of special inspection requirements.
 - b. Acknowledgement that control will be exercised to obtain conformance with documents approved by the Building Official.
 - c. Procedures for exercising control within the Contractor's organization.
 - d. Identification and qualifications of persons exercising control.
 4. Testing Laboratory Qualifications: Prior to start of construction, submit latest inspection report of testing laboratory facilities indicating current accreditation by the accreditation authority.

1.05 STRUCTURAL OBSERVATION

- A. A licensed engineer acting as the Owner's agent shall make visual observations of the work to assess general conformance with the Contract Documents at significant construction stages.

1.06 INSPECTION AND TESTING

- A. The Project Representative may throughout the duration of construction, inspect construction and test materials to assure Contractor conformance with these specifications. Special inspections and associated testing, as shown on the drawings, will also be performed by approved Special Inspectors for compliance with IBC. This testing will be in addition to that required of the Contractor in this and other specification sections.

1.07 COSTS

- A. Paid by the Owner:
1. Special inspections and testing, as specified in this Section, will be paid by the Owner. Retests and re-inspections required due to defective work will be paid by the Contractor and deducted from the Contractor's Pay Request in the month following the re-test or reinspection. The costs shall be the invoiced costs from the special inspection and testing company hired by the City.
- B. Paid by the Contractor:
1. Testing to demonstrate and document conformance with the Contract Documents and applicable permits and codes, with the exception of Special Inspections and associated testing for compliance with **IBC, Chapter 17**.

2. Retesting and re-inspections required due to defective work.
3. Testing performed for the convenience of the Contractor.
4. Mechanical and electrical component testing and certification.

1.08 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor shall cooperate with testing personnel. Contractor shall provide access to the work and supplier's operations.
- B. Contractor shall deliver adequate samples of materials proposed to be used and which require testing to the Testing Laboratory or as otherwise directed by the Project Representative.
- C. Contractor shall furnish casual labor and facilities, including but not limited to obtaining and handling samples, repairing of test areas to match original conditions, storage and curing of samples, etc.
- D. Contractor shall provide all testing required to demonstrate compliance with the Contract Documents not associated with the testing for special inspections. Additional testing requirements are specified in the technical specification sections.
- E. Contractor shall maintain a deficiency log documenting tests, dates, results, witnesses, and retests as necessary. Logs shall be initialed by those present during the testing.

1.09 SPECIAL INSPECTOR'S RESPONSIBILITIES

- A. Special Inspector shall keep records of inspections.
- B. Special Inspector shall provide inspection reports to the Project Representative and Building Official.
- C. Special Inspector shall provide a final report documenting special inspections and correction of any discrepancies noted in the inspections.
- D. Special Inspector shall attend pre-construction conferences and construction progress meetings if requested by the Project Representative.

1.10 APPROVED AGENCY'S RESPONSIBILITIES

- A. The Approved Agency shall employ personnel experienced and trained to perform the types of tests or inspections required for this project.
- B. The Approved Agency personnel performing testing of welds shall be certified in accordance with AWS QC 1.

1.11 SPECIAL INSPECTION AND TESTING REPORTS

A. Report Contents: At a minimum, Special Inspection and Testing Reports shall include the following:

1. Project name and date of report.
2. Testing laboratory name, address, telephone number, name of laboratory field sampling personnel, and name of lab testing personnel, as applicable.
3. Date, time, and location of sampling, testing, and inspecting.
4. Ambient temperature and weather conditions at the site or shop and curing conditions of samples.
5. Product identification and referenced specification section number.
6. Type of sample, test, and inspection and industry standard for sampling and testing.
7. Results of sample, test, and inspection.
8. Evaluation of compliance with requirements in Contract Documents.

B. Distribution of Reports:

1. Test and Inspection reports shall be submitted to the Project Representative for information as described in **Section 01 33 00 – Submittal Procedures**. Test reports shall be submitted not more than two days after completion of required tests. Inspection reports shall be submitted immediately if deficiencies or significant irregularities are noted, and in no case less than two working days after said inspection.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. The Contractor shall furnish access to the Work as required for special inspections, testing and structural observations.
- B. The Contractor shall notify the Project Representative in advance of required special inspections and structural observation no later than three (3) days prior to the date of the inspection.
- C. Contractor shall correct defective work at no additional cost to the Owner. Structural observation will be performed by the registered professional engineer.

END OF SECTION

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SECTION 01 50 00 TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Furnishing, maintaining, and removing construction facilities and temporary controls, including temporary utilities, construction aids, barriers and enclosures, security, access roads, temporary controls, project sign, field offices and sheds, and removal after construction.
- B. Related sections:
 - 1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
 - 2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.

1.02 TEMPORARY UTILITIES

- A. Temporary electrical power:

Power is not available at the site. The Contractor will be responsible for providing and paying for generators or other power source as needed.
- B. Temporary electrical lighting:
 - 1. In work areas, provide and pay for 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.
- C. 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. Contractor to provide and pay for all labor, equipment, and materials required to heat, cool, and ventilate the Work and workers.
- D. Temporary water:
 - 1. The Contractor shall provide and pay for potable water or bottled water for workers and/or the work as needed.
- E. Temporary sanitary facilities:
 - 1. Provide, pay for, and maintain self-contained portable sanitary facilities for the Contractor's and subcontractor's use. Facilities shall be serviced, cleaned and disinfected frequently.

2. Provide and pay for 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.

F. Temporary telephone:

1. Provide and pay for temporary telephone service and high speed internet service for the Contractor's use.

G. Temporary Fire Protection:

1. Provide, pay for, 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, storage sheds, tool houses, temporary buildings, and throughout the construction site.

H. 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.

1.03 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.

1. Use construction hoists, scaffolds, stages, shoring, and similar temporary facilities of ample size and capacity to adequately support and move loads.

B. Design temporary supports with adequate safety factor to assure adequate load bearing capability:

1. When requested, submit design calculations by professional registered engineer in Washington prior to application of loads.
2. Submitted design calculations are for information and record purposes only.

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. 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.
 - 2. Provide barricades with flashing lights after dark.
 - 3. Keep barriers and warning devices in place until hazard is removed

1.04 SECURITY

- A. Make adequate provision for protection of the work area against fire, theft, and vandalism, and for protection of public against exposure to injury.
- B. Provide temporary chain-link fencing to separate the work zone from the rest of the facility. Temporary fencing shall meet the following requirements:
 - 1. Minimum 2-inch (50-mm), 0.148-inch- (3.76-mm-) thick, chain-link fabric fencing.
 - 2. Minimum 6-feet (1.8 m) high with galvanized steel pipe posts
 - 3. Minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73 mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails.

1.05 ACCESS

- A. 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.
 - 2. Maintain similar roads to existing facilities on site of the Work to provide access for maintenance and operation.
 - 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. Under no circumstances shall vehicles leaving the site track mud off the site onto the public right-of-way.
- B. On-site Public Access:
 - 1. Maintain access for traveling public and neighboring businesses in the project area.

1.06 TEMPORARY CONTROLS

- A. Noise control:
 - 1. Comply with City of Tacoma Noise Ordinance 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.

1.07 FIELD OFFICES AND SHEDS

- A. Contractor's field office:
 - 1. Maintain on Project Site weather tight space in which to keep copies of Contract Documents, progress schedule, shop drawings, and other relevant documents.
 - 2. Provide field office with adequate space to examine documents, and provide lighting and telephone service in that space.
 - 3. Have field office ready for occupancy prior to start of site work.

1.08 REMOVAL

- A. Remove temporary buildings and furnishings before inspection for Final Completion or when directed.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore existing facilities used during construction to specified or original condition.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 55 26 TRAFFIC CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section specifies requirements for temporary traffic control during construction.

PART 2 PRODUCTS

- A. Construction signs, barricades, traffic safety drums, traffic cones, tubular markers, and portable changeable message signs (PCMS) shall conform to the requirements of the latest version of the Manual on Uniform Traffic Control Devices (MUTCD).

PART 3 EXECUTION

3.01 CONSTRUCTION UNDER TRAFFIC

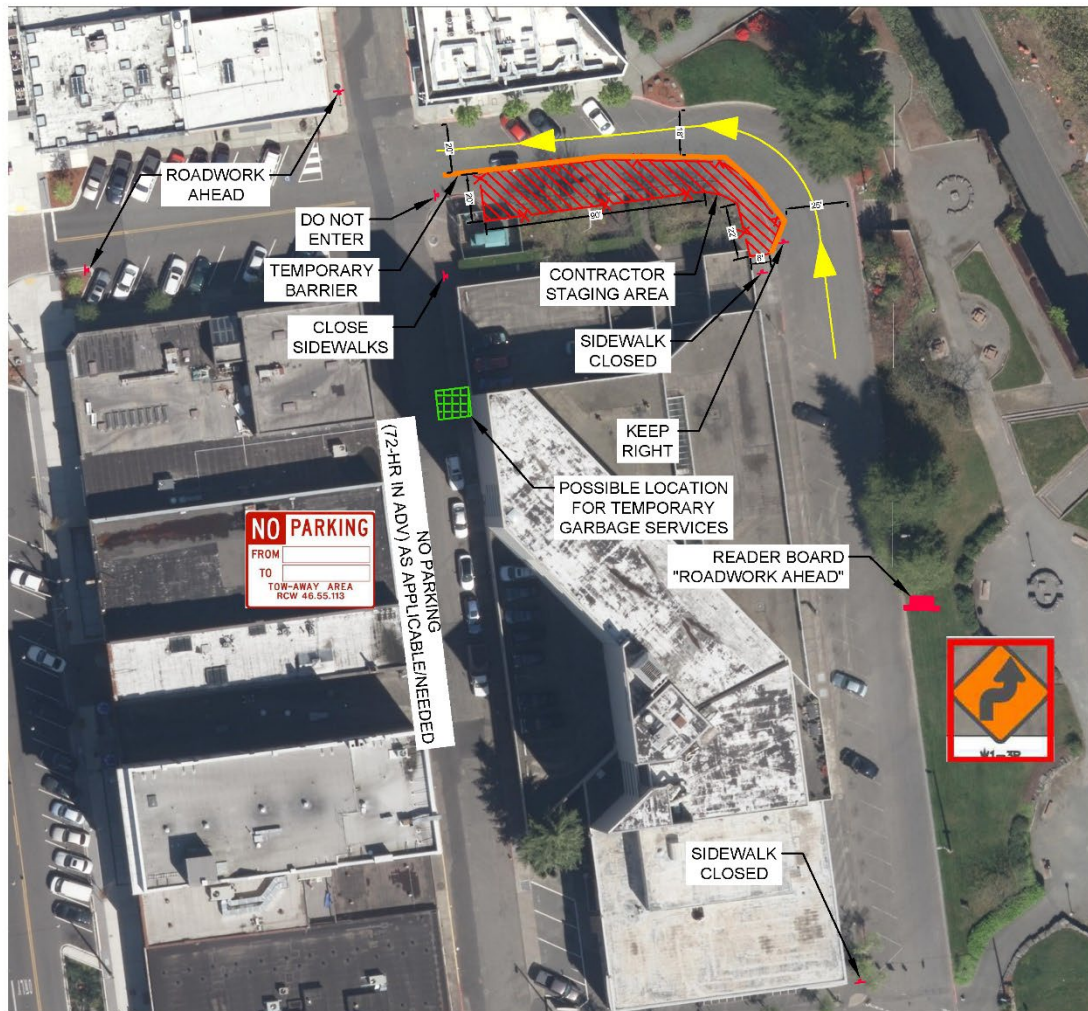
- A. The Contractor shall be responsible for providing adequate safeguards, safety devices, protective equipment, and any other needed actions to protect the life, health, and safety of the public, and to protect property in connection with the performance of the Work covered by the Contract.
- B. The Contractor shall perform any measures or actions the Project Representative may deem necessary to protect the public and property.
- C. The responsibility and expense to provide this protection shall be the Contractor's.
- D. Shoulder closures are allowed without restrictions as long as:
 - 1. Minimum lane width of 10 feet can be maintained, and
 - 2. The number of vehicle lanes are not restricted/minimized, and
 - 3. The traffic control devices are approved for night-time operation, and
 - 4. Pedestrian routing is in conformance with City-approved traffic control plans provided by the Contractor.
- E. The Contractor shall provide, install, and maintain traffic control as shown in the approved Traffic Control Plans, included herein. If the Contractor elects to make modifications to the approved Traffic Control Plans, the Contractor shall provide them to the Project Representative for review and approval a minimum of three (3) calendar days prior to implementation.

- F. The Contractor shall provide flaggers, signs, PCMS, and other traffic control devices.
- G. PCMS shall be installed a minimum seven (7) calendar days prior to beginning of construction. Messaging and location of PCMS shall be coordinated and approved by the Project Representative.
- H. The Contractor shall erect and maintain all construction signs, warning signs, detour signs, and other traffic control devices necessary to warn and protect the public at all times from injury or damage as a result of the Contractor's operations which may occur on highways, roads, streets, sidewalks, or paths. No work shall be done on or adjacent to any traveled way until all necessary signs and traffic control devices are in place.
- I. If the Project Representative determines the permitted closure hours adversely affect traffic, the Project Representative may adjust the hours accordingly. The Project Representative will notify the Contractor in writing of any change in the closure hours.
- J. Lane closures are not allowed on any of the following:
 - 1. A holiday,
 - 2. A holiday weekend (unless requested 72 hours in advance and approved by the City of Tacoma); holidays that occur on Friday, Saturday, Sunday or Monday are considered a holiday weekend. A holiday weekend includes Saturday, Sunday, and the holiday.
 - 3. After 12:00pm (noon) on the day prior to a holiday or holiday weekend, and
 - 4. Before 12:00pm (noon) on the day after the holiday or holiday weekend.

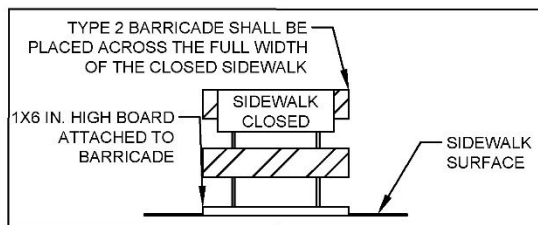
3.02 ATTACHMENTS

- A. Following this Specification Section's "End of Section" designation are part of this. Specifications Section:
 - 1. Traffic Control Plans (3 pages)
 - a. Site A without Contractor parking area
 - b. Site A with Contractor parking
 - c. Site B without Contractor parking area

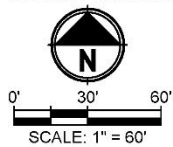
END OF SECTION



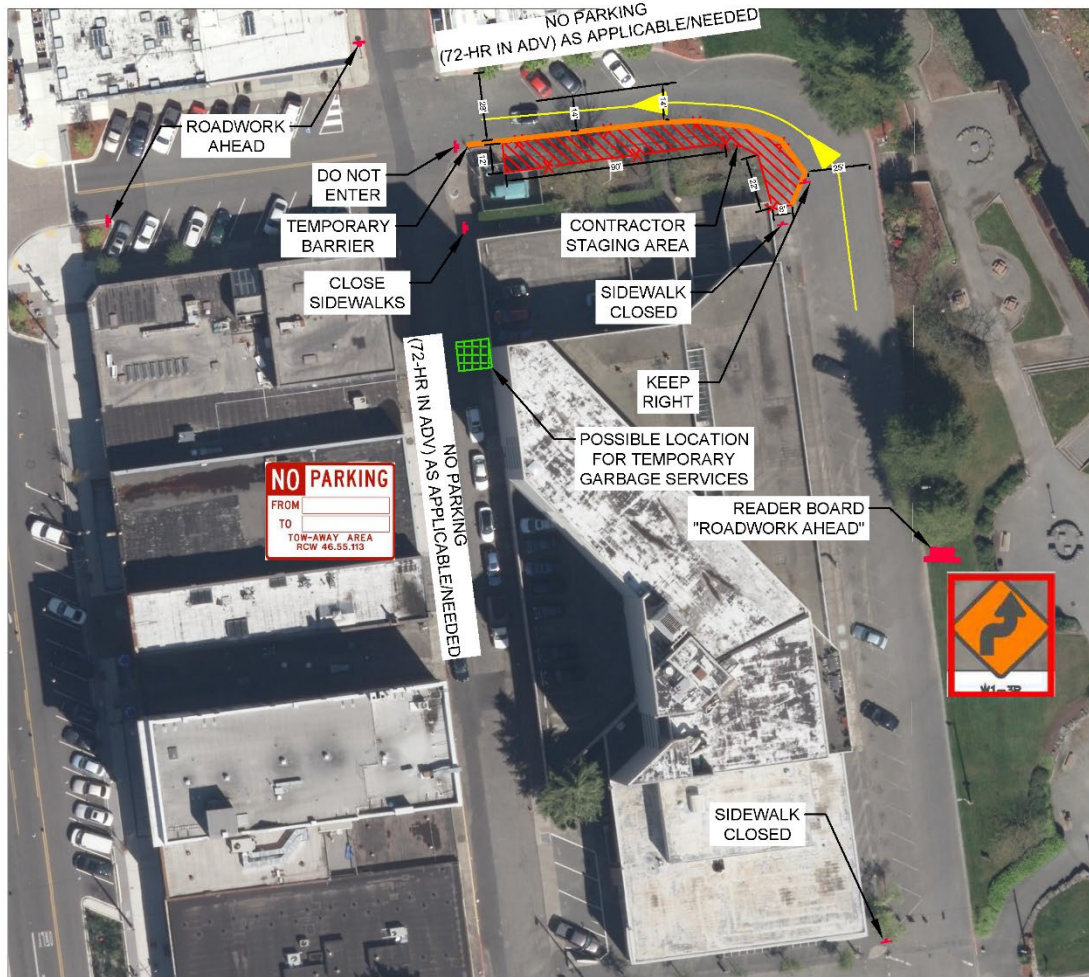
SIDEWALK HARD CLOSURE POINT DETAIL



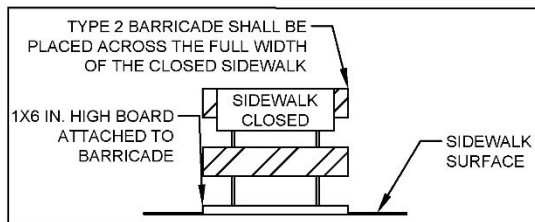
Traffic control - 8th and Court A.dwg October 10, 2022



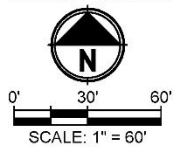
Traffic Control Plan
City of Tacoma
Downtown Compactor Project
8th and Court A



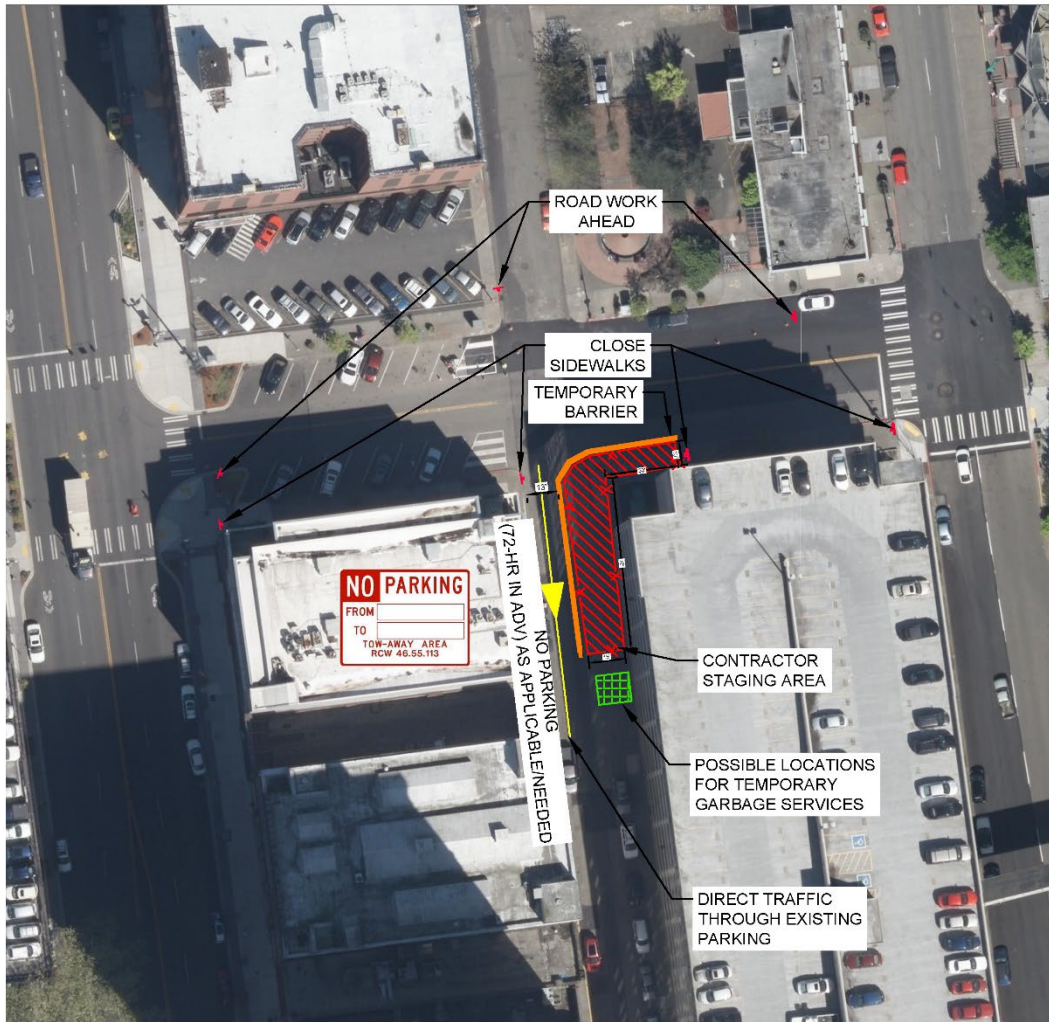
SIDEWALK HARD CLOSURE POINT DETAIL



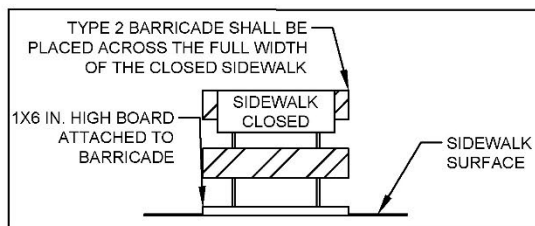
Traffic control - 8th and Court A wParking.dwg October 10, 2022



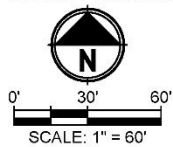
Traffic Control Plan
City of Tacoma
Downtown Compactor Project
8th and Court A



SIDEWALK HARD CLOSURE POINT DETAIL



Traffic control- 10th and Court A.dwg October 10, 2022



Traffic Control Plan
City of Tacoma
Downtown Compactor Project
10th and Court A

SECTION 01 60 00 PRODUCT SUBSTITUTIONS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section includes:
 - 1. The procedure for requesting the approval of substitution of a product that is not equivalent to a product which is specified by descriptive or performance criteria or defined by reference to one or more of the following:
 - a. Name of manufacturer.
 - b. Name of vendor.
 - c. Trade name.
 - d. Catalog number.
 - 2. Substitutions are not "or-equals".
- B. Related Sections:
 - 1. **Section 01 33 00 - Submittal Procedures** specifies requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule.
 - 2. Any applicable Technical Specifications
- C. Request for Substitution – General:
 - 1. Base all bids on materials, equipment, and procedures specified.
 - 2. Certain types of equipment and kinds of material are described in specifications by means of references to names of manufacturers and vendors, trade names, or catalog numbers.
 - a. When this method of specifying is used, it is not intended to exclude from consideration other products bearing other manufacturer's or vendor's names, trade names, or catalog numbers, provided said products are "or-equals," as determined by Owner.
 - 3. Other types of equipment and kinds of material may be acceptable substitutions under the following conditions:
 - a. Or-equals are unavailable due to strike, discontinued production of products meeting specified requirements, or other factors beyond control of Contractor; or,
 - b. Contractor proposes a cost and/or time reduction incentive to the Owner.

1.03 QUALITY ASSURANCE

- A. In making request for substitution or in using an allowed product, Contractor represents that Contractor:
1. Has investigated proposed product, and has determined that it is adequate or superior in all respects to that specified, and that it will perform the function for which it is intended.
 2. Will provide same guarantee for substitute item as for product specified.
 3. Will coordinate installation of accepted substitution into Work, to include building modifications if necessary, making such changes as may be required for work to be complete in all respects.
 4. Waives all claims for additional costs related to substitution which subsequently arise.
 5. Cost data is complete and includes all related costs under his/her contract, but excludes:
 - a. Cost under separate contracts.
 - b. Design Consultant's redesign, unless designated. Costs incurred for any substitutions made by the Contractor which requires additional work or changes in the Contract Documents in order to accommodate such substitutions shall be paid for by the Contractor.

1.04 PRE-BID SUBSTITUTIONS

- A. Definition: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by a Bidder, and accepted by the Owner during the Bidding Period, must comply with the following:
1. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.
 2. No substitution will be considered unless written request for approval has been submitted and has been received by the Owner at least six (6) working days prior to the date for receipt of bids.
 - a. Each such request shall be electronically submitted with a "Request for Substitution" form at the end of this section, and shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. The Owner's decision of approval or disapproval of a proposed substitution shall be final.
 3. Substitutions will be reviewed by the Owner and Owner's consultant within five (5) calendar days.

4. If the Owner approves any proposed substitution, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner. Addendums will be issued within five (5) calendar days the substitution was given.

1.05 POST-BID SUBSTITUTIONS

- A. Definition: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for post-bid substitutions.
- B. Post-Bid substitutions will be submitted electronically and if accepted through change order.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS

- A. Conditions: The Owner will receive and consider the Contractor's request for substitution after the time stated hereinabove during the bid period for reviewing substitutions, only in exceptional cases where the Contractor submits evidence satisfactory to the Owner, when items 1, 2, 3, 4, 5, plus at least one other, of the following conditions are satisfied, as determined by the Owner. If the following conditions are not satisfied, the Owner will return the requests without action except to record noncompliance with these requirements.
 1. Specified products are unavailable through no fault of the Contractor.
 2. Extensive revisions to the Contract Documents are not required.
 3. Proposed changes are in keeping with the general intent of the Contract Documents.
 4. The request is timely, fully documented, and properly submitted.
 5. The proposed product meets all aspects of the Contract Documents and the Contractor certifies that the proposed substitution provides the required warranty.
 6. The specified product or method of construction cannot be provided within the Contract Time. The Owner will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 7. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.

8. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be allowed.
 9. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
 10. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
- B. The Contractor's submittal and the Owners acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.
- C. Substitution will not be considered if:
1. They are indicated on Shop Drawings or other Project data submittals, without proper notice shown on attached form.
 2. Acceptance will require substantial revisions of Contract Documents.

PART 3 EXECUTION

(NOT USED)

END OF SECTION



City of Tacoma
Environmental Services Department
Science and Engineering Division

Substitution Request Form

Project: _____ Substitution Request Number: _____

From: _____
To: _____ Date: _____

Engineer Project Number: _____
Re: _____ Contract For: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____
Manufacturer: _____ Address: _____ Phone: _____
Trade Name: _____ Model No.: _____
Installer: _____ Address: _____ Phone: _____

History: ☐ New product ☐ 2-5 years old ☐ 5-10 yrs old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

☐ Point-by-point comparative data attached - REQUIRED BY ENGINEER

Reason for not providing specified item: _____

Similar Installation:

Project: _____ Architect: _____
Address: _____ Owner: _____
_____ Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

Savings to Owner for accepting substitution: _____ (\$ _____).
Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

The Undersigned certifies:

- * Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
 - * Same warranty will be furnished for proposed substitution as for specified product.
 - * Same maintenance service and source of replacement parts, as applicable, is available.
 - * Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
 - * Cost and schedule data as stated above is complete. Claims for additional costs or time related to accepted substitution which may subsequently become apparent are to be waived.
 - * Proposed substitution does not affect dimensions and functional clearances.
 - * Payment will be made for changes to building design, including Engineer design, detailing, and construction costs caused by the substitution.
 - * Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.
-

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: _____

ENGINEER's REVIEW AND ACTION

- ☐ Substitution accepted - Make submittals in accordance with Specification Section 01 33 00.
- ☐ Substitution accepted as noted - Make submittals in accordance with Specification Section 01 33 00
- ☐ Substitution rejected - Use specified materials.
- ☐ Substitution Request received too late - Use specified materials.

Signed by:

Date:

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ Engineer ☐ _____

SECTION 01 73 24 DESIGN REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS AND NON-BUILDING STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

- A. Seismic anchorage, support, and bracing requirements for mounted and suspended equipment, distribution systems, and other nonstructural components required in accordance with the **2018 International Building Code (IBC)** and provides design criteria for seismic restraints for piping.

1.02 QUALITY ASSURANCE

- A. The references listed below are a part of this Section. 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.

REFERENCE	TITLE
ASCE 7	Minimum Design Loads for Building Structures
IBC	2018 International Building Code
SMACNA	Seismic Restraint Manual Guidelines for Mechanical Equipment
USGS	USGS Ground Motion Parameter Calculator

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with each paragraph check-marked to indicate compliance or marked to indicate requested deviations.
- C. Shop drawings no less than 4 weeks in advance of installation of component, equipment or distribution system to be anchored to structure.
- D. Anchorage and Bracing Calculations for attachments, braces, and anchorages shall include **IBC** and Project-specific criteria as noted on General Structural Notes on drawings in addition to manufacturer's specific criteria used for design. Calculations shall be prepared, stamped, dated, and signed by a Professional

Structural Engineer registered in the state of Washington. Calculations shall be submitted no less than 4 weeks in advance of installation of component, equipment or distribution system to be anchored to structure.

- E. List of mechanical and electrical equipment requiring Contractor-designed anchorage and bracing weighing 2,000 pounds or more.
- F. Attachment assemblies' drawings, including seismic attachments; include connection hardware, braces, and anchors or anchor bolts for nonexempt components, equipment, and systems.

1.05 DESIGN AND PERFORMANCE REQUIREMENTS

- A. In accordance with **IBC 2018**, all mechanical and electrical components and systems shall be anchored and braced to resist gravity, seismic, wind, and operational loads prescribed in the code and **ASCE 7**. This includes all components and systems which are free standing, supported by stand-frames, suspended, anchored to walls, and anchored to floors or slabs.
- B. Design anchorage and bracing of mechanical and electrical components and systems in accordance with this section, unless a design is specifically provided within Contract Documents or where exempted hereinafter.
- C. Submittal will be rejected if proposed anchorage method would create excessive stress to supporting member. Revise anchorages and strengthen structural support to eliminate overstressed condition.
- D. Anchor and brace piping, whether exempt or not exempt from this Section, so that lateral or vertical displacement does not result in damage or failure to essential mechanical or electrical equipment.
- E. Provide supplementary framing where required to transfer anchorage and bracing loads to structure.
- F. Adjust equipment pad sizes or provide additional anchorage confinement reinforcing to provide required anchorage capacities.
- G. Design anchorage and bracing for:
 - 1. Equipment and components that weigh more than 400 pounds.
 - 2. Equipment weighing more than 20 pounds that has center of mass located more than 4 feet above adjacent finished floor.
 - 3. Mechanical and electrical components that are not provided with flexible connections between components and associated piping or conduit.
 - 4. Distribution systems that weigh more than 5 pounds per foot that have center of mass located more than 4 feet above adjacent finished floor.
- H. Design seismic anchorage and bracing for Designated Seismic Systems regardless of weight or mounting height.

1. Unless otherwise indicated, the SDS value (design, 5 percent damped, spectral response acceleration parameter for short periods) shall be determined for the equipment installation using the **USGS** Ground Motion Parameter Calculator found at:
<http://earthquake.usgs.gov/designmaps/us/application.php>
 2. Using the latitude and longitude of the location of the equipment installation expressed to two decimal points. Unless otherwise indicated, Site Class D shall be assumed.
 3. Importance Factor: $I_p = 1.5$
 4. Component Amplification Factor: from **ASCE/SEI 7**, Table 13.5-1 and Table 13.6-1.
 5. Component Response Modification Factor: from **ASCE/SEI 7**, Table 13.5-1 and Table 13.6-1
- I. For components exempted from design requirements of this Section, provide bolted, welded, or otherwise positively fastened attachments to supporting structure.
- J. Design Loads:
1. Gravity: Design anchorage and bracing for self weight and superimposed loads on components and equipment.
 2. Operational:
 - a. For loading supplied by equipment manufacturer for **IBC** required load cases.
 - b. Loads may include equipment vibration, torque, thermal effects, effects of internal contents, and other load-inducing conditions.
 - c. Locate braces to minimize vibration to structure.
 - d. For vibrating loads, use anchors meeting requirements of **Section 05 50 00 – Metal Fabrications** or **Section 05 05 20 - Anchor Bolts**, for anchors with designated capacities for vibratory loading per manufacturer's ICC-ES report.
 3. Seismic:
 - a. In accordance with **2018 IBC**, Section 1613, and Chapter 13 of **ASCE 7**.
 - b. Design anchorages for parts or elements of mechanical and electrical systems in accordance with provisions of **IBC** and as indicated in the Drawings:
 - 1) Design forces for anchors in concrete shall be in accordance with **IBC** Section 1905.1.9 as applicable for Project Seismic Design Category.
- K. Seismic Design Requirements:
1. Analyze local region of body of nonstructural component for load transfer of anchorage attachment.
 2. The following are exempt from requirements for provision of seismic anchorages and bracing, in addition to those items specifically exempted in **ASCE 7**, Part 13.5 for architectural components and Part 13.6 for electrical and mechanical equipment:
 - a. Temporary or movable equipment.

3. Provide support drawings and calculations for electrical distribution components if any of the following conditions apply:
 - a. Conduit diameter is greater than 2.5 inch trade size.
 - b. Total weight of bus duct, cable tray, or conduit supported by trapeze assemblies exceeds 10 pounds per foot.

PART 2 PRODUCTS

2.01 GENERAL

- A. Other seismic design and detailing information identified in **ASCE 7**, Chapter 13, is required to be provided for new mechanical and electrical components, systems, or equipment.
- B. Design and construct attachments and supports transferring seismic and non-seismic loads to structure of materials and products suitable for application and in accordance with design criteria as indicated in Drawings and nationally recognized standards.
- C. Provide anchor bolts for anchorage of equipment to concrete in accordance with **Section 05 05 20 – Anchor Bolts**. Provide anchor bolts of the size, minimum embedment, and spacing designated in calculations submitted by Contractor and accepted by the Project Representative.
- D. Provide post-installed concrete and masonry anchors for anchorage of equipment to concrete in accordance with **Section 05 05 20 – Anchor Bolts**. Provide post-installed anchors of the size, minimum embedment, and spacing designated in calculations submitted by Contractor and accepted by the Project Representative.

PART 3 EXECUTION

3.01 GENERAL

- A. Make attachments, bracing, and anchorage in such a manner that component lateral force is transferred to lateral force resisting system of structure through a complete load path.
- B. Design, provide, and install overall seismic anchorage system to provide restraint in all directions, including vertical, for each component or system so anchored.
- C. Provide snubbers in each horizontal direction and vertical restraints for components mounted on vibration isolation systems where required to resist overturning.
- D. Provide piping anchorage that maintains design flexibility and expansion capabilities at flexible connections and expansion joints.

1. Piping suspended more than 12 inches below supporting structure shall be braced for seismic effects to avoid significant bending of hangers and their attachments, unless high-deformability piping is used per **ASCE 7** Section 13.6.8.
- E. Anchor tall and narrow equipment such as motor control centers and telemetry equipment at base and within 12 inches from top of equipment.
- F. Do not attach mechanical or electrical components to more than one element of a building structure at a single restraint location where such elements may respond differently during a seismic event. Do not make such attachments across building expansion and contraction joints.

3.02 INSTALLATION

- A. Do not install components or their anchorages or restraints prior to review and acceptance by the Project Representative.
- B. Deferred submittals shall be submitted to and approved by the Tacoma Permits Department prior to installation.
- C. Notify the Project Representative upon completion of installation of seismic restraints in accordance with **Section 01 40 00 – Quality Control Requirements**.

3.03 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

- A. In accordance with **Sections 05 50 00 – Metal Fabrications** and **05 50 20 – Anchor Bolts**.
- B. Owner-Furnished Quality Assurance, in accordance with IBC Chapter 17 requirements, is provided in Statement of Special Inspections Plan on Drawings. Contractor responsibilities and related information are included in **Section 01 40 00– Quality Control Requirements**.
- C. Provide any other specified, regulatory required, or required repair verification inspection and testing.

END OF SECTION

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SECTION 01 74 19 MANAGEMENT AND DISPOSAL OF WASTE

PART 1 GENERAL

1.01 SUMMARY

- A. This Section includes:
 - 1. Construction and demolition (C&D) Material Management Plan and disposal.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.01 GENERAL DISPOSAL

- A. The City will provide up to three dumpsters for:
 - 1. Demolition Waste:
 - a. Pulverize concrete to maximum size suitable for recycling or reuse applications.
 - b. Reinforcement may need to be removed and recycled with other metals.
 - 2. Scrap Metal:
 - a. Scrap metal, such as fencing and old reinforcement bar and electrical equipment.
 - 3. Construction Waste:
 - a. Other waste.
- B. The City will deliver pick up dumpsters and dispose waste at no cost to the Contractor.
- C. Weekly Review: Discuss C&D debris management at least weekly during standard safety/coordination meetings.
 - 1. Possible topics
 - a. Discuss highlights and shortcomings of the previous week's diversion program
 - b. Overall project diversion schedule
 - c. Upcoming C&D issues on site
 - 1) Moving/Locations of containers
 - 2) Source separated bins on site for specific scopes/contractors
- D. Do not burn waste materials.

END OF SECTION

SECTION 01 78 00 CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes administrative and procedural requirements for substantial completion, final inspection, and request for final payment and acceptance of the work.

1.02 RELATED SECTIONS

- A. **Section 00 72 00 – General Conditions, Part 5.21 – Warranty of Construction as amended by City of Tacoma, Section 00 73 00.**
- B. **Section 00 72 00 - General Conditions, Part 6.09 – Final Completion, Acceptance, and Payment as amended by City of Tacoma, Section 00 73 00.**
- C. **Section 01 33 00 – Submittal Procedures.**
- D. **Section 01 78 39 – Project Record Documents.**

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with each paragraph check-marked to indicate compliance or marked to indicate requested deviations.
- C. No Contract will be accepted until the following items have been submitted:
 - 1. Manufacturer's certification of proper installation where required in the specifications.
 - 2. All guaranties, bonds, certifications, licenses, and affidavits required for work or equipment as specified.
 - 3. All permits, approvals, notifications, disposal certificates or salvage receipts for all waste materials.
 - 4. "As Built" drawings for the project records, as specified in **Section 01 78 39 – Project Record Documents.**
 - 5. Release of Liens or Claims.
 - a. Satisfactory evidence of release of liens has been submitted to the Owner.
 - b. Complete releases of all claims have been submitted to the Project Representative.

6. Manufacturer's Certificates:
 - a. Where required in the specification sections, submit a manufacturer's certification of proper installation of equipment prior to startup or performance testing.
 - b. Such certificate shall state that the equipment or system has been installed in accordance with the manufacturer's recommendations and has been inspected by a manufacturer's authorized representative, that it has been properly serviced, and that the proper electrical connections have been made

1.05 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance, and extra materials in quantities specified in individual specification sections
- B. Deliver to project site, and place in locations as directed. Obtain receipt prior to final payment

1.06 WARRANTIES AND GUARANTIES

- A. Requirements are specified in **Section 00 72 00 – General Conditions, Part 5.21 as amended by City of Tacoma, Section 00 73 00.**

PART 2 PRODUCTS

2.01 ACCESSORIES

- A. Furnish to the Owner, upon acceptance of equipment, all accessories required to place each item of equipment in full operation.
- B. These accessory items include, but are not limited to, special tools and other items as required for initial operation.

PART 3 EXECUTION

3.01 OPERATIONAL TESTING

- A. Conduct all operational tests pursuant to the requirements of **Part 5.15 of Section 00 72 00 – General Conditions** as amended by City of Tacoma, Section 00 73 00 and the individual specification sections.

3.02 CLOSEOUT SCHEDULE AND PROCEDURES

- A. Submit all guaranties and warranties in accordance with **Section 00 72 00 – General Conditions, Part 5.21 as amended by the City of Tacoma, Section 00 73 00.**

3.03 CLEANUP AND RESTORATION

A. Building and Parking Areas.

1. Areas that have been used for temporary buildings and parking shall be restored by removing buildings, temporary utilities, debris and waste. Restore the areas by scarifying and contouring the areas to evenly sloped pre-construction conditions or better.

B. Finishing and Cleanup

1. General: Periodically, as directed by the Project Representative, and immediately after completion of the Work, the Contractor shall clean up and remove all refuse and unused materials of any kind resulting from the Work. Upon failure to comply within twenty-four hours after directed by the Project Representative, the Owner may do the Work and deduct the cost therefor from the final payment due the Contractor. Upon completion of the Work, the Contractor shall remove its equipment, clean the project area, and perform other restoration to the satisfaction of the Project Representative.

END OF SECTION

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SECTION 01 78 39 PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies requirements for a final as-built survey and record drawings.

1.02 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. One neatly and legibly marked set of full-size record drawings.
- C. AutoCAD drawings, prevailing version.

PART 2 PRODUCTS

2.01 GENERAL

- A. The record drawing set shall be kept separate from other construction drawings and shall not be used for other purposes.
- B. Use waterproof red felt-tip pens to make changes on the drawings. Notations are to be neat, legible, clear, and concise.
- C. Show the actual as-built location along with all changes made during construction.

2.02 AUTOCAD DRAWINGS

- A. When Contractor drawings are prepared using computer-aided drafting (CAD) record drawing shall be provided both in electronic format and on half-size prints. Electronic format shall be AutoCAD, prevailing version.

2.03 SPECIFICATIONS AND ADDENDA

- A. Legible mark up each section to record:
 - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment installed.
 - 2. Changes made by Change or Field Orders.
 - 3. Other Matters not originally specified.

PART 3 EXECUTION

3.01 DOCUMENT MAINTENANCE

- A. Maintain at construction site one copy of:
 - 1. Contract drawings.
 - 2. All permits.
 - 3. Project manual.
 - 4. Addenda.
 - 5. Reviewed shop drawings.
 - 6. Change orders.
 - 7. Field test records.
 - 8. Maintenance data delivered with equipment.
- B. Store documents in field office, apart from documents used for construction.
- C. Maintain documents in clean, dry, legible condition.
- D. Do not use record documents for construction purposes.
- E. Documents shall at all times be available for inspection by the Project Representative.

3.02 PROGRESS

- A. Record information concurrently with the progress of construction and maintain current on a weekly basis.
- B. No work shall be concealed until the required information is recorded.
- C. The status of record drawings shall be determined for each progress payment. No payment will be made for the Contract work if record drawings are not current or complete for the billing period.

3.03 RECORDING CHANGES

- A. Record information on the Drawings for the following conditions:
 - 1. Actual dimensions, arrangement, and materials used when different than shown on the Drawings.
 - 2. Changes made by Change Order or Field Directive.
 - 3. Changes made by the Contractor.
 - 4. Record Drawings shall be in AutoCAD, prevailing version.

END OF SECTION

SECTION 01 91 00 COMMISSIONING

PART 1 GENERAL

1.01 DESCRIPTION

- A. This section contains requirements for the Contractor's performance during the commissioning of the structures, equipment and systems constructed and installed during the course of this contract. All commissioning work, as described in this section and in **Section 26 08 00 – Commissioning of Electrical Systems**, shall be performed by the Contractor. The contractor shall be responsible for participation in the commissioning process. Commissioning procedures will be designed and conducted under the direction of a Commissioning Authority (CA) hired by the Owner. Execution of the program is primarily the responsibility of the Contractor

1.02 QUALITY ASSURANCE

- A. Commissioning Team:
1. The Contractor shall assemble a commissioning team under the direction of an individual duly authorized to commit the Contractor's personnel and resources to respond to requests for assistance on the part of the Owners CA. The commissioning team shall consist of representatives of the Contractor's electrical and instrumentation subcontractors, and others as appropriate. The commissioning team shall be available at the site of the work during normal working hours (8 hours a day, 5 days a week, Saturdays, Sundays, and legal holidays excepted) and shall be available within 2 hours' notice by telephone at all other times. The commissioning team shall at all times be equipped and ready to provide for emergency repairs, adjustments, and corrections to the equipment and systems installed and modified as a part of this contract.

1.03 SUBMITTALS

- A. The following information shall be submitted to the Construction Manager in accordance with the provisions of **Section 01 33 00 – Submittal Procedures**:
1. Detailed plans for commissioning each process unit and each system constructed or modified as a part of the work performed under this contract.
 2. The contractor shall provide the CA with copies of approved submittals, manufactures recommended installation/start-up documents, proposed testing formats, training plans, as-built documentation, O&M Manuals and other commissioning related materials as requested by the CA. The CA will review and approve this material for commission related activities.
 3. The Contractor's plan for providing a commissioning team conforming to the requirements of **paragraph 01 91 00-1.02 A** during the commissioning period. The plan shall be complete with a daytime staffing plan and names,

qualifications, and telephone numbers of those assigned to off-hour standby duty.

PART 2 PRODUCTS

2.01 GENERAL

- A. Working with the CA, the Contractor shall develop and produce a detailed, written plan for the startup and initial operation, under actual operating conditions, of the equipment and systems installed and constructed under this contract. The document, after acceptance by the CA, shall serve as the guidance manual for the commissioning process.

PART 3 EXECUTION

3.01 GENERAL

- A. After completion of the equipment and system performance and operational testing, where required, and agreement on the part of the Project Representative that the systems did meet all test requirements, commissioning will begin. The commissioning period shall be 10 working days. The Project Representative shall confirm in writing the date(s) that the system is ready for commissioning and on which actual commissioning activities commence. Activities conducted prior to such written confirmation shall not constitute commissioning.
- B. The Owner's operation and maintenance personnel will be responsible for operation of the systems to be commissioned. The portion of the work to be commissioned shall be fully operational, performing all functions for which it was designed.
- C. The Contractor shall be available at all times during commissioning periods to provide immediate assistance in case of failure of any portion of the system being constructed. At the end of the commissioning period and when all corrections required by the CA to assure a reliable and completely operational facility are complete, the CA shall issue a completion certificate. Each system shall have been issued a completion certificate as a condition precedent to the final acceptance of the work of this contract.
- D. During the commissioning period, the Owner shall be responsible for all normal operational costs and the Contractor shall bear the costs of all necessary repairs or replacements, including labor and materials, required to keep the portion of the plant being commissioned, operational.

END OF SECTION

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SECTION 02 41 00 DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section specifies demolition, salvage, removal, and disposal of surface and subsurface structures, utilities, and related ancillary components.
- B. Work specified also includes removal, relocation, and disposal of selected improvements as indicated, located within street right-of-way or area of existing improvements, where care must be exercised to prevent damage to existing utilities or portion of improvements that are to remain.

1.02 DEFINITIONS

- A. Asphalt Concrete Pavements: Streets or other surfaces constructed from bituminous mix, or any combination of bituminous mixes or surface treatments.
- B. Concrete Pavements: Streets, curbs and gutters, driveways, or other slabs greater than four inches in thickness, constructed from Portland cement concrete.
- C. Concrete Sidewalks: Concrete slabs four inches or less in thickness.
- D. Utilities: Sanitary sewer, storm drain, water, gas, electric, and other utilities.

1.03 SITE CONDITIONS

- A. Unknown Conditions
 - 1. The Contract related documents may not represent all surface and subsurface conditions at the site and adjoining areas. Verify actual conditions before commencing work.
 - 2. Perform surveys and potholes to locate existing utilities, including connection point on existing sewer main for Site A.
 - 3. Protect existing utilities from damage.

1.04 DEMOLITION AND REMOVAL CONSTRUCTION WORK PLAN

- A. Prepare a Demolition and Removal Construction Work Plan in accordance with **Section 01 40 00 – Quality Control Requirements**
- B. Include the following items in the Demolition and Removal Construction Work Plan:
 - 1. Demolition schedule, including timing for utility disconnects and durations or roadway impacts

2. Description of the proposed sequence, demolition methods, and equipment to be used in the demolition process
3. Description of proposed disposal of materials including provisions for maximizing recycling and reuse of materials
4. Description of haul routes and access points.
5. Description of cleanup methods

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.01 PERMITS

- A. Preservation of Survey Markers and Monuments
 1. Refer to **Section 01 07 23 – Field Engineering.**
- B. Protection of Persons and Property
 1. Erect and maintain barricades, signs, and other measures as necessary to protect the public, workers, and adjoining property from damage from demolition work, all in accordance with applicable codes and regulations.
 2. Protect utilities, pavements, and facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by the demolition operations.
 3. Replace or compensate the owner for any vegetation permanently damages outside the construction limits.
- C. Protection of Utilities
 1. Protect active sewer, water, gas, electric, telecommunications, and other utilities found or otherwise made known to the Contractor before or during demolition work. If utility is damaged, immediately notify the Engineer and the utility owner for corrective action.

3.02 PREPARATION

- A. Minimum erosion control measures shall include perimeter erosion/sedimentation control, protection of catch basins, and stabilization of exposed soils.
- B. All erosion control shall be in place prior to clearing. The Contractor shall call the City of Tacoma Inspector for initial erosion control inspection prior to start of work, upon completion of:
 1. Staking of clearing limits.
 2. Installation of erosion control prior to site grading.
 3. Prior to removal of erosion control devices.

- C. Erosion control measures shall be maintained at all times to the approval of the City of Tacoma Inspector.
- D. All material removed from site shall be placed only at a permitted site. Verify location of destination of material prior to exportation.
- E. Shrubs, Trees, and Vegetation
 - 1. Remove all trees, shrubs, and other vegetation as shown on the Plans, and as specified in **Section 31 11 00 – Clearing and Grubbing** and **Section 31 13 00 – Selective Tree and Shrub Removal and Trimming**.
 - 2. Protect trees and shrubs outside of construction limits and street trees within construction limits. See **Section 32 90 00 – Planting** for tree and shrub protection requirements.

3.03 DEMOLITION

- A. Backfill depressions caused by excavation, demolition, and removal with materials placed in accordance with **Section 31 20 00 – Earth Moving**. Backfill and level to grades as indicated on the Contract Drawings.
- B. Remove asphalt pavement, cement concrete curb and gutters, sidewalks, and slabs as shown on the Contract Drawings.
- C. In removing pavement, sidewalks, curbs, and gutters, the Contractor shall:
 - 1. Haul broken-up pieces to an off-project site.
 - 2. Make a full vertical full depth saw cut between any existing pavement, sidewalk, curb, or gutter that is to remain and the portion to be removed. For concrete removal, a second vertical full depth relief saw cut offset 12 to 18 inches from and parallel to the initial saw cut is also required, unless the Project Representative allows otherwise.
 - 3. Replace at no expense to the City any existing pavement designated to remain that is damaged during the removal of other pavement.

3.04 DEBRIS AND MATERIAL SALVAGE, RECYCLING, AND DISPOSAL

- A. Perform salvage recycling, and disposal-related work in accordance with **Section 01 74 19 - Management and Disposal of Waste**.
- B. Remove materials, waste, and debris from the site at frequent intervals so that its presence will not delay the progress of work or create unsafe or unsanitary conditions.
- C. Contain runoff so drainage through concrete spalls or debris remains on-site and does not go into storm drains without being treated.

END OF SECTION

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SECTION 03 30 31 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies cast-in-place reinforced concrete, including embedded material and formwork.

1.02 QUALITY ASSURANCE

- A. Referenced Standards: This Section incorporates by reference the latest revision of the following documents. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
ACI 301	Specifications for Structural Concrete for Buildings
ACI 318	Building Code Requirements for Reinforced Concrete
ASTM A615	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C33	Specification for Concrete Aggregates
ASTM C94	Specification for Ready-Mixed Concrete
ASTM C150	Specification for Portland Cement
CRSI-MSP	Manual of Standard Practice
CRSI-PRB	Placing Reinforcing Bars

- B. Testing:
1. Perform materials testing to demonstrate conformance with the specifications
 2. Perform Quality Control per **Section 01 40 00 – Quality Control Requirements**.
- C. Be responsible for controlling the quality of the materials and work.
- D. Obtain services of an independent testing laboratory to perform required tests to document compliance with the Contract requirements.
- E. Perform work of this section in accordance with the Referenced Standards.
- F. Be responsible for results of the cured concrete specified and placed per the requirements of this Section, and perform required repair and remediation to meet the Contract Documents.

1.03 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Concrete-Mix Designs.
- C. Reinforcing Steel.
- D. Concrete Placement Drawings.
- E. Admixtures.
- F. Curing Compound.
- G. Bonding and Repair Materials.
- H. Submit manufacturer's data on specified products showing compliance with requirements.
- I. Submit manufacturers' data on contractor selected products showing quality and suitability for the application. Contractor selected products are to be standards typically used in the industry for similar applications.
- J. On a project-wide basis, provide the following:
 - 1. Total cement used, in pounds
 - 2. Total cement substitutes used, in pounds

1.04 CONCRETE MIX DESIGNS

- A. Compressive Strengths: Unless otherwise specified, provide the following as minimum:
 - 1. Concrete compressive strength at 28 days: 4,000 psi.

PART 2 PRODUCTS

2.01 REINFORCEMENT

- A. Comply with the following as minimums:
 - 1. Bars: **ASTM A615**, Grade 60, unless otherwise indicated.
 - 2. Bending: **ACI 318**.
 - 3. Welded wire fabric: **ASTM A**.
- B. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the **CRSI MSP-1**.
- C. Place reinforcing in accordance with **CRSI-PRB**, the Drawings, and the applicable Shop Drawing per reinforcing supplier.

- D. Do not use reinforcement having any of the following defects:
1. Bar lengths, depths, or bends exceeding the specified fabricating tolerances.
 2. Bends or kinks not indicated on the Drawings or required for this work.
 3. Bars with cross-section reduced due to excessive rust or other causes.

2.02 CONCRETE

- A. Minimum Requirements:
1. Portland Cement: **ASTM C150**, Type I or II, low-alkali.
 2. Aggregate, General:
 - a. **ASTM C33**, uniformly graded and clean.
 - b. Non-potentially reactive with cement alkalis.
 - c. Do not use aggregate known to cause excessive shrinkage.
 3. Aggregate, Coarse: Crushed rock or washed gravel with size between 3/4-inch and 1-1/2 inches.
 4. Aggregate, Fine: Natural washed sand of hard and durable particles varying from fine to particles passing a 3/8-inch screen, of which at least 12 percent shall pass a 50-mesh screen.
 5. Water: Clean and potable.
 6. Water-Cement ratio: 0.42.
 7. Air Content: 4 to 6 percent.
- B. Test Reports:
1. Admixtures, test reports showing chemical ingredients and percentage of chloride in each admixture.
 2. Statement identifying fine and course aggregates reactivity with test results of **ASTM C1293** completed within the previous two years.
 3. Determine water soluble chloride in each component of aggregates in accordance with **ASTM C1218**.
 4. For each trial concrete mix design and signed by a qualified mix designer.

2.03 BONDING AGENT

- A. Furnish two component, 100% solids epoxy, conforming to **ASTM C881**. Type V.
1. Consult manufacturer for surface finish, pot life, set time, vertical or horizontal application, and forming restrictions
 2. Approved manufacturers:
 - a. BASF Building Systems, Shakopee, MN; Concreactive.
 - b. Sika Chemical Corp., Lyndhurst, NJ; Sikadur 32.
 - c. Euclid Chemical Co., Cleveland, OH; Euco Epoxy System.
 - d. Contech Services, Inc., Seattle, WA.

2.04 FORM RELEASE AGENT

- A. Material: Release agent shall not bond with, stain, or adversely affect concrete surfaces, and shall not impair subsequent treatments of the concrete surfaces. A ready-to-use water based material formulated to reduce or eliminate surface imperfections, containing no mineral oil or organic solvents. Release agent shall be environmentally safe, and shall meet the requirements of the referenced standards.
- B. Acceptable Products:
 - 1. BASF: MBT Rheofinish 211.
 - 2. Cresset Chemical Company: Crete-Lease 20-VOC or Crete-Lease 880-VOC.
 - 3. US Mix Products Company: US SPEC Aqua Blue

PART 3 EXECUTION

3.01 EXISTING CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected meeting approval of the Project Representative.

3.02 EMBEDDED ITEMS

- A. Do not embed piping in structural concrete unless indicated on the drawings.
- B. Electrical Conduit:
 - 1. Locate to maintain maximum strength of the structure.
 - 2. Increase the thickness of the concrete if the outside diameter exceeds 30 percent of the thickness of the concrete.
 - 3. Electrical conduit to be embedded in concrete shall be rigid galvanized steel conduit. Aluminum conduit is prohibited for embedment in concrete.
- C. Set and secure embedded trench frames, bolts, inserts, and other required items in the precise locations needed so they are not displaced.
- D. Prior to concrete placement, assure the actual locations of embedded items are noted on the as-built set of drawings.

3.03 FORMS

- A. Construct forms to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.
- B. Provide $\frac{3}{4}$ -inch chamfer on all concrete exterior corners.

3.04 MIXING CONCRETE

- A. On Site Mixing of the concrete shall be in accordance with provisions of **ACI 301**. Mix in drum type batch mixer, complying with **ASTM C685**.
- B. Transit Mixers: Concrete mixing shall be in accordance with **ACI 301**. Ready mix concrete shall conform to **ASTM C94**.
- C. Do not use concrete that has stood for over 30 minutes after leaving the batch plant, or concrete that is not placed within 90 minutes after water is first introduced into the mix.
- D. Do not add additional water to the concrete mix after it has left the batch plant unless prior approval is obtained from the Project Representative.

3.05 PLACING CONCRETE

- A. Preparation:
 - 1. Remove foreign matter accumulated in the forms.
 - 2. Rigidly close openings left in the formwork.
 - 3. Wet wood forms sufficiently to tighten up cracks; wet other material sufficiently to maintain workability of the concrete.
 - 4. Use only clean tools.
- B. Conveying:
 - 1. Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.
 - 2. Deposit concrete as nearly as practicable in its final location so as to avoid separation due to rehandling and flowing.
 - 3. Do not use concrete which becomes non-plastic and unworkable, or does not meet required quality control limits, or has been contaminated by foreign materials.
 - 4. Remove concrete from the work site that does not meet specifications.
- C. Placing Concrete in Forms:
 - 1. Deposit concrete in horizontal layers not deeper than 24 inches, and avoid inclined construction joints.
 - 2. Remove temporary spreaders in forms when concrete has reached the elevation of the spreaders.
- D. Placing Concrete Slabs:
 - 1. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 - 2. Bring slab surfaces to the correct level with a straightedge, and then strike off.
 - 3. Use bullfloats or darbies to smooth the surface, leaving the surface free from bumps and hollows.
 - 4. Do not sprinkle water on the plastic surface.

5. Do not disturb the slab surface prior to start of finishing operations.

E. Place all concrete in accordance with **ACI 301**.

3.06 CONSOLIDATION

A. Consolidate each layer of concrete while placing by use of internal concrete vibrators and supplemented by hand spading, rodding, or tamping.

B. Do not vibrate forms or reinforcement.

C. Do not use vibrators to transport concrete inside the forms.

3.07 JOINTS

A. Construction Joints:

1. Unless shown otherwise, do not use horizontal construction joints.
2. If construction joints are found to be required, submit for the Project Representative's approval of joint design and location prior to start of concrete placement.

3.08 CONCRETE FINISHING

A. Unless otherwise indicated, provide the following finishes at the indicated locations.

1. Float Finish: Apply to monolithic slab surfaces that are to receive trowel finish and other finishes specified hereinafter.
2. Trowel Finish: Apply to monolithic slab surfaces that are to be exposed to view.
3. Non-Slip Broom Finish: Apply to top of walls, walks, drives, ramps, and similar pedestrian and vehicular areas.
4. Scratch finish: apply to monolithic slab surfaces that are to receive concrete floor topping or mortar setting bed.
5. Wall Finish:
 - a. Fill snap-tie holes with non-shrink, non-metallic grout.
 - b. Knock off projections.
 - c. Patch honeycomb areas and rock pockets. Small air holes do not require patching.

3.09 CURING AND PROTECTION

A. Comply with requirements of **ACI 301**. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

1. Normal concrete: Not less than 7 days.

2. High early strength concrete: Not less than 4 days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for specified curing period by water ponding, water-saturated sand, water-fog spray, saturated burlap, or special blankets designed for curing concrete and maintaining moist condition.
 2. Begin final curing after initial curing but before surface is dry.
- E. After completion of curing process, finished surface where indicated shall be protected by use of protection boards from workman, equipment, scaffolding, and any other form of damage throughout subsequent construction. Size, thickness, and material of board shall be determined by Contractor. Contractor is responsible for maintaining integrity of slab finish throughout construction.

3.10 FIELD QUALITY CONTROL

- A. Be responsible for Quality Control of Work for materials, placement, curing, and finishing.
- B. Perform tests of concrete and concrete materials to ensure conformance with specified requirements per **ACI 318**.
- C. Compressive Strength Tests: **ASTM C39**. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 50 cu yd or less of concrete placed per day.

END OF SECTION

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SECTION 03 45 00 PRECAST CONCRETE

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
1. Smooth, colored precast concrete cap units for pilaster and walls for enclosures located at Site A and Site B, including anchors/attachments, perimeter seals, intermediate joint seals, grouting, and anti-graffiti coating.
- B. Related Requirements:
1. **Section 03 30 31 - Cast-in-Place Concrete.**
 2. **Section 03 60 00 - Grouting.**
 3. **Section 04 22 00 - Concrete Unit Masonry.**
 4. **Section 07 19 00 - Clear Water Repellents.**
 5. **Section 07 90 00 - Joint Protection.**
 6. **Section 09 90 00 - Painting and Coating.**

1.02 REFERENCES

1.03 QUALITY ASSURANCE

- A. Referenced Standards: This Section incorporates by reference the latest revision of the following documents. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
ACI 211.1	Normal, Heavy Weight, and Mass Concrete, Practice for Selecting Proportions
ACI 318	Building Code Requirements for Reinforced Concrete
ACI 533R	Advanced Cast Stone 2 03450-2
AISC	Guide for Precast Concrete Wall Panels
ASTM A36/ A36M	American Institute of Steel Construction
ASTM A185	Standard Specification for Carbon Structural Steel
ASTM A307	Standard Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement
ASTM A496	Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM A572/ A572M	Standard Specification for Steel Wire, Deformed, for Concrete
ASTM C33	Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
	Standard Specification for Concrete Aggregates

REFERENCE	TITLE
ASTM C39/ C39M	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C150	Standard Specification for Portland Cement
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C330	Standard Specification for Lightweight Aggregates for Structural Concrete
ASTM C404	Standard Specification for Aggregates for Masonry Grout
ASTM C494/ C494M	Standard Specification for Chemical Admixtures for Concrete
ASTM C642	Standard Test Method for Density, Absorption, and Voids in Hardened Concrete
ASTM C979	Standard Specification for Pigments for Integrally Colored Concrete
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C1240	Standard Specification for Use of Silica Fume as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar and Grout; 20
ASTM D412	Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
ASTM F593	Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
CCRL	Cement and Concrete Reference Laboratory
CRSI	Concrete Reinforcing Steel Institute – Manual of Standard Practice
PCI	Precast/Prestressed Concrete Institute
PCI MNL-117	Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products
SSPC	Steel Structures Painting Council
SSPC Paint 20	Zinc-Rich Primers (Type I, Inorganic, and Type II, Organic)
SSPC Paint 25	Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II

1.04 SUBMITTALS

- A. Specified in **Section 01 33 00 -Submittal Procedures.**
- B. Shop Drawing:
1. Show in-place location, manufacturing details, plans, elevations, anchorages, reinforcement, connection details and methods, dimensions, finishes, relationships to adjacent materials, and erection and placement.
 2. Show identification marks, coordinated to Shop Drawings, and date of manufacture on all units to facilitate hauling and erection.
 3. Setting diagrams, templates, instructions and directions as required for installation.

4. Engineering Calculations: Engineering calculations as required sealed by an engineer registered in the state of Washington.
- C. Mix Design(s): Proposed concrete mix design for each type and color of concrete mix required including backup mix.
- D. Material Test Reports: Submit material certificates signed by manufacturer for concrete materials, reinforcing materials, admixtures, and similar items.
- E. Certifications:
 1. Manufacturer's certification from APA, PCI, or applicable municipal certifications.
 2. Welder's AWS certification. Submit for each welder.
- F. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors, textures, and patterns.
 1. Verification Samples: For each finish product specified, two samples, approximately 12 inches (300 mm) square, representing actual product, color, texture, and patterns.

1.05 QUALITY ASSURANCE

- A. Manufacturer's Qualifications.
 1. Firm shall have a minimum of five years experience in producing precast concrete units similar to those required for this Project, with sufficient production capacity to produce and deliver required units without causing delay in Work.
 2. Fabricating plant shall be certified by one of the following:
 - a. Architectural Precast Association (APA).
 - b. Precast/Prestressed Concrete Institute (PCI), Group A1.
 - c. Or Equal Certification Program.
- B. Installer's Qualifications: Installer shall have a record of at least five years of successful installation of units similar to those required for this Project.
- C. Welder's Qualifications: Provide certification that welders to be employed in the Work are certified by AWS and applicable local building officials, and have been re-certified in the last 12 months.
- D. Mock-Up: Provide a mock-up for evaluation of surface finishes and workmanship.
 1. Provide initial production units for job-site assembly with other materials for approval. Coordinate type and location of mock-ups with project requirements. Accepted units will be used as the standard for acceptance of production units. Remove and replace units which are not accepted.
 2. Do not proceed with remaining work until workmanship, color, and finish are approved by the Project Representative.

3. Refinish mock-up area as required to produce acceptance by the Project Representative.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle precast concrete units in strict compliance with manufacturer's instructions and recommendations and industry standards. Protect from damage. Lift and support units only at designated lifting points as shown on approved Shop Drawings.
- B. Deliver units to the Project site in such quantities and at such times to ensure continuity of installation.
- C. Handle precast concrete units to position, consistent with their shape and design. Lift and support only from support points.
- D. Provide anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions and directions as required for installation.
- E. Blocking and Lateral Support During Transport and Storage: Clean, non-staining, without causing harm to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.
- F. Protect units to prevent staining, chipping, or spalling of concrete.
- G. Mark units with date of production in location not visible to view when in final position in structure. Project/site conditions

PART 2 PRODUCTS

2.01. MANUFACTURERS

- A. Acceptable Manufacturers:
 1. Pacific Stone Design, Inc. (PSD, Inc.); 1201 E. Wakeham Avenue, Santa Ana, CA 92705; Telephone: (714) 826-5757; Website: www.pacificstone.net
 2. Product Model WC-102-11S Straight Palisade (No Lip) – wall cap
 3. Product Model PC-102-21 – pilaster cap
- B. Substitutions:
 1. Products of equal quality must be submitted and approved by Project Representative at least ten (10) days prior to bid date
 2. No substitutions will be accepted after General Contractor is awarded

2.02 APPLICATIONS/SCOPE

- A. Design units to withstand design loads as calculated in accordance with applicable code, and erection forces. Calculate structural properties of units in accordance with **ACI 318**.
1. Wind Loads.
 2. Seismic forces.
 3. Building dynamics, thermal, live, impact or concentrated loads, structural deflection, story drift.

2.03 MATERIALS

- A. Concrete Materials:
1. Portland Cement: Complying with **ASTM C150**, Type I or III, white or gray colors to achieve desired finish colors. Use only one brand, type, and color from the same mill. Gray cement may be used for non-exposed backup mixes.
 2. Aggregates: Complying with **ASTM C33**, gradation may differ to achieve desired finish characteristics. Select coarse and fine aggregate colors and screen sizes to match approved sample(s). Verify that adequate supply, from one pit or quarry, for each type of aggregate is available for the entire Project. If possible obtain entire aggregate supply prior to starting Work, or have aggregate supply held in reserve by aggregate supplier.
 3. Lightweight aggregate: Complying with **ASTM C330**.
 4. Water: Potable. Clean, clear, and free from deleterious amounts of salts, acids, alkalies, organic materials, oils, detergents, or other matter that may interfere with color, curing, or strength of concrete.
 5. Admixtures: Select to be compatible in specified mix.
 - a. Air Entraining: Complying with **ASTM C260**.
 - b. Water Reducing: Complying with **ASTM C494**, Type A, B, C, For G.
 - c. Silica Fume: Complying with **ASTM C1240**, for cement replacement for high performance concrete.
 - d. Coloring Agent: Complying with **ASTM C979**, compatible with other concrete materials.
 - e. Other constituents: Integral water repellents and other chemicals for which no ASTM standard exists, shall be previously established as suitable for use in concrete or shall be shown by test or experience not to be detrimental to the concrete.
- B. Bearing Pads: Elastomeric pads, complying with **ASTM D412**.
- C. Grout Materials:
1. Cement Grout: Cement complying with **ASTM C150**; sand complying with **ASTM C404**; proportions 1:2.5 by volume, minimum water for placement and hydration.
 2. Non-Shrink Grout: Complying with **ASTM C1107**.
 3. Epoxy Grout: Consult Suppliers.

4. Grout Color: Warm Tan

D. Anti-Graffiti Coating according to **SECTION 09 90 00 - Painting and Coating.**

2.04 MIXES

- A. Design mixes for each type of concrete specified shall be prepared by an independent testing agency or by an architectural precast manufacturing plant at precast manufacturer's option. Proportion mixes by either testing agency trial batch or field test data methods in accordance with **ACI 211.1**, using materials to be used on the Project, to provide concrete with properties as follows:
1. Concrete Density: Normal weight.
 2. Concrete Density: Lightweight.
 3. Compressive Strength: 5,000 psi (35 MPa) when tested in accordance with **ASTM C39/C39M**.
 4. Maximum water cement ratio 0.40 at point of placement.
 5. Add air-entrainment admixture to result in air content at point of placement complying with ACI 533R requirements.
 6. Water absorption maximum 6% (by weight) when tested in accordance with **ASTM C642**.

2.05 MANUFACTURING

- A. General:
1. Fabricate precast concrete units with manufacturing and testing procedures, quality control recommendations, and dimensional tolerances as specified in **PCI MNL-117** or **ACI 533R**, unless more stringent requirements are shown or specified.
 2. Fabricate units straight, smooth and true to size and shape, with exposed edges and corners precise and square, unless otherwise indicated.
- B. Cast openings larger than 10 inches (254 mm) in any dimension according to locations shown on Shop Drawings. Smaller holes may be field cut when approved by Architect.
- C. Reinforcement: Comply with CRSI Manual of Standard Practice, **PCI MNL-117**, or **ACI 533R** recommendations. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses, and to comply with specified performance criteria.
- D. Pretension tendons for units in compliance with **PCI MNL-117** or **ACI 533R**.
- E. Cast-in Items: Provide embedded anchors, inserts, steel shapes, and lifting devices as shown on reviewed Shop Drawings. Window connections are best made by field drilled inserts. Firmly hold cast items in place by jigs, strongbacks, or other approved means.

- F. Comply with **PCI MNL-117** or **ACI 533R** requirements for measuring, mixing, transporting, and placing concrete. Place facing mix to a thickness of the greater of 1 inch (26 mm) or 1.5 times the maximum aggregate size. Place back-up concrete to ensure bond with face concrete.
- G. Consolidate concrete using equipment and procedures complying with **PCI MNL-117** or **ACI 533R**.
- H. Permanently mark units with pick-up points as shown on reviewed Shop Drawings. Imprint casting date and piece mark on a surface to be concealed from view in the finished structure.
- I. Cure concrete in accordance with **PCI MNL-117** or **ACI 533R** requirements.
- J. Discard units that are warped, cracked, broken, spalled, stained, or otherwise defective unless repairs are approved by the Architect and meet specified requirements. Refer to ACI- 533R for product finish requirements unless otherwise shown or specified.
- K. Manufacturing Tolerances: Fabricate to tolerances listed in **PCI MNL-117** or **ACI 533R**.

2.06 FINISHES

- A. Finish exposed surfaces or units be “Sand” finish per manufacturer.
- B. Color shall be Rosso 12 (Mocha Brown) per manufacturer.
- C. Finish exposed surfaces of precast concrete pilaster and wall caps in accordance with the following:
 - 1. Smooth sandy surface finish shall be free from pockets, sand streaks, honeycomb, with uniform color and texture. State whether bugholes less than 5/8 inch (16 mm) in diameter are acceptable.
 - 2. Textured surface finish from form liners or inserts.
 - 3. Acid etched finish using acid solution and application techniques to expose aggregate and surrounding matrix.
- D. Finish exposed back surface of precast concrete pilaster and wall caps:
 - 1. To match face surface of units.
 - 2. By smooth, steel trowel finish.
- E. Finish unexposed surfaces of precast concrete pilaster and wall caps by float finish or as-cast form finish.

2.07 SOURCE QUALITY CONTROL

- A. Inspect and test architectural precast concrete in accordance with **PCI MNL-117** or **ACI 533R**.

- B. The Owner may retain an independent Testing Laboratory to evaluate manufacturer's quality control and testing methods. Testing Laboratory shall be certified by **CCRL** or similar National authority. Manufacturer shall allow Testing Laboratory access to all operations pertinent to the Project.
- C. Defective Work: Discard units that do not conform to requirements as shown or specified. Replace with units which meet requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Field Dimensions: Furnish field dimensions to manufacturer as required.
- C. Examine substrates and conditions for compliance with requirements for installation, tolerances, true and level bearing surfaces, and other conditions affecting performance of architectural precast concrete units.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Do not install units until supporting structure has been completed and has attained minimum allowable design compressive strength.

3.02 ERECTION

- A. Erect units using personnel experienced and trained in placement and securing of precast concrete units.
- B. Lift and handle precast using lift points and embeds as shown on approved shop drawings.
- C. Erect level, plumb, and true to line. Do not allow cumulative dimensional errors to develop.
 - 1. Adjustments such as shimming which would place additional stress on units shall not be permitted.
 - 2. Adhere to dimensional tolerances in accordance with PCI recommendations.
- D. Erect and secure in a manner to prevent damage to units or units in place.
- E. Erection Tolerances. Erect within tolerances listed in **PCI MNL-117** Appendix I or **ACI 533R**.
- F. Joint Sealants: As specified in **Section 07 90 00 – Joint Protection**.

- G. Where two stage joint seal is required, sequence with sealant application to ensure that sealant, gaskets, and similar items required for interior side seal are installed concurrently with installation of precast units.

3.03 CLEANING

- A. Clean exposed surfaces of units after erection if soiled or stained.
 - 1. Wash and rinse according to architectural precast concrete manufacturer's recommendations. Protect other work from damage while cleaning.
 - 2. Do not use cleaning materials or methods that change the appearance of architectural precast concrete finishes. Test clean a small area to verify adequacy and safety of materials and methods.
 - 3. Leave in condition for application of water repellents specified in **Section 07 90 00 – Joint Protection**.

3.04 PROTECTION

- A. Subsequent trades to Protect finished surfaces from soiling or damage.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
 - 1. Repair exposed surfaces of units to match color, texture, and uniformity of surrounding units.
 - 2. Remove and replace damaged units when repairs do not meet requirements.

END OF SECTION

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SECTION 03 60 00 GROUTING

PART 1 GENERAL

1.01 SUMMARY

This section specifies:

- A. Grout for column base plates (color: warm tan).
- B. Grout for other structural supports, equipment bases, surface repair and uses other than masonry (color: gray).
- C. Epoxy grout and adhesives for dowel and anchor setting (color: gray).

1.02 QUALITY ASSURANCE

- A. The references listed below are a part of this Section. 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.

REFERENCE	TITLE
ASTM C150	Standard Specification for Portland Cement
ASTM C33	Standard Specification for Concrete Aggregates
ASTM E329	Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with each paragraph check-marked to indicate compliance or marked to indicate requested deviations.
- C. Complete product literature and installation instructions for the following:
Cementitious non-shrink grout, epoxy grout, adhesive for dowel and anchor setting, and concrete repair mortar products to be used on the project.

- D. Product Data: Submit product data for all grout products specified in Part 2 of this Section. Product data shall include:
1. Catalog information,
 2. Technical data,
 3. Storage requirements,
 4. Product life,
 5. Working time after mixing,
 6. Temperature considerations,
 7. Conformity to required ASTM Standards and Material Safety Data Sheet (MSDS),
 8. Type and brand of the cement,
 9. Gradation of the fine aggregate, and
 10. Proposed admixtures and the proposed mix of the grout for non-packaged mixes.
- E. Current ICC Evaluation Service reports for adhesives used for dowel and anchor setting.
- F. Installer certification in accordance with ACI/CRSI Adhesive Anchor Installer Certification Program for installers of horizontal or upwardly inclined adhesive anchors.

1.05 QUALITY ASSURANCE

- A. Testing:
1. Perform Quality Control per **Section 01 40 00 – Quality Control Requirements**.
 2. Provide the services of an independent testing laboratory which complies with the requirements of **ASTM E329** if a product other than those listed below is proposed and test data is not available from the supplier to demonstrate equivalence to the specified grout. The testing laboratory shall sample and test the proposed grout materials. Costs of testing laboratory services shall be borne by the Contractor.
- B. Certifications:
1. Installer certification shall be in accordance with ACI/CRSI Adhesive Anchor Installer Certification Program for installers of horizontal or upwardly inclined adhesive anchors.
- C. Qualifications:
1. Submit documentation that grout manufacturer has at least 3 years' experience in the production and use of the proposed grouts which they will supply.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the jobsite in original, unopened packages, clearly labeled with the manufacturer's name, product identification, batch numbers and printed instructions.
- B. Store materials in full compliance with the manufacturer's recommendations. Total storage time from date of manufacture to date of installation shall be limited to 12 months or the manufacturer's recommended storage time, whichever is less.
- C. Material which becomes damp or otherwise unacceptable shall be immediately removed from the site and replaced with acceptable material at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 CEMENTITIOUS NON-SHRINK GROUT

- A. Cementitious non-shrink non-metallic aggregate grout shall be:
 - 1. BASF, Masterflow 928
 - 2. Euclid Chemical Company, Hi-Flow Grout
 - 3. Five Star Products, Inc., Five Star Grout
 - 4. Sika Corporation, SikaGrout 212

2.02 ADHESIVE FOR DOWEL AND ANCHOR SETTING

- A. Adhesive for setting dowels and anchoring connection/base plate bolts shall be an injectable two-component epoxy adhesive. Adhesive shall be approved for the intended use per the product ICC Report. Adhesive shall be:
 - 1. Hilti, HIT-RE 500v3
 - 2. Simpson Strong Tie, SET XP Anchoring Adhesive

2.03 CONCRETE REPAIR MORTAR

- A. Horizontal Applications: Repair mortars shall be:
 - 1. BASF, MasterEmaco S 466CI
 - 2. Sika Corporation, SikaTop 111 Plus
- B. Vertical and Overhead Applications: Repair mortars shall be:
 - 1. BASF, MasterEmaco 1500HCR Vertical Overhead
 - 2. Sika Corporation, SikaTop 123 Plus

2.04 CEMENT GROUT

- A. Cement grouts shall be a mixture of one part Portland Cement conforming to ASTM C150, Types I, II, or III and 1 to 2 parts sand conforming to ASTM C33 with sufficient water to place the grout. The water content shall be sufficient to impart workability to the grout but not to the degree that it will allow the grout to flow.

2.05 CONCRETE GROUT

- A. Concrete grout shall conform to the requirements of **Section 03 30 31 – Cast in Place Concrete** except as specified herein. Proportion with Type II Portland Cement, pozzolan, coarse and fine aggregates, water, water reducer and air entraining agent to produce a mix having an average strength of 3500 psi at 28 days (2500 psi nominal strength). Coarse aggregate size shall be 3/8-inch maximum. Slump shall not exceed 5 inches. Minimum cement content shall be 540 lbs per cubic yard and maximum water-to-cement ratio shall be 0.45.

2.06 WATER

- A. Potable water, free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.

2.07 LIKE MATERIALS

- A. In areas of common viewing, products shall be of one manufacturer or supplier in order to provide standardization of appearance.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine and accept existing conditions before beginning work.

3.02 PREPARATION

- A. Place grout over cured concrete that has attained its full design strength unless otherwise approved by the Project Representative.
- B. Concrete surfaces to receive grout shall be clean and sound; free of ice, frost, dirt, grease, oil, curing compounds, laitance and paints and free of all loose material or foreign matter which may affect the bond or performance of the grout.
- C. Roughen concrete surfaces by chipping, sandblasting, or other mechanical means to ensure bond of the grout to the concrete. Remove loose or broken concrete. Irregular voids or projecting coarse aggregate need not be removed if they are sound, free of laitance and firmly embedded into the parent concrete.

1. Air compressors used to clean surfaces in contact with grout shall be the oilless type or equipped with an oil trap in the airline to prevent oil from being blown onto the surface.
- D. Remove all loose rust, oil or other deleterious substances from metal embedments or bottom of baseplates prior to the installation of the grout.
- E. Concrete surfaces shall be washed clean and then kept moist for at least 24 hours prior to the placement of cementitious or cement grout. Saturation may be achieved by covering the concrete with saturated burlap bags, use of a soaker hose, flooding the surface, or other method acceptable to the Project Representative. Upon completion of the 24-hour period, visible water shall be removed from the surface prior to grouting. The use of an adhesive bonding agent in lieu of surface saturation shall only be used when approved by the Project Representative for each specific location of grout installation.
- F. Epoxy-based grouts do not require the saturation of the concrete substrate. Surfaces in contact with epoxy grout shall be completely dry before grouting.
- G. Construct grout forms or other leakproof containment as required. Forms shall be lined or coated with release agents recommended by the grout manufacturer. Forms shall be of adequate strength, securely anchored in place and shored to resist the forces imposed by the grout and its placement.
 1. Forms for epoxy grout shall be designed to allow the formation of a hydraulic head and shall have chamfer strips built into forms.
- H. Level and align the structural or equipment bearing plates in accordance with the structural requirements and the recommendations of the equipment manufacturer.
- I. Equipment shall be supported during alignment and installation of grout by shims, wedges, blocks or other approved means. The shims, wedges and blocking devices shall be prevented from bonding to the grout by appropriate bond breaking coatings and removed after grouting unless otherwise approved by the Project Representative.

3.03 INSTALLATION – GENERAL

- A. Mix, apply and cure products in strict compliance with the manufacturer's recommendations and this Section.
- B. Have sufficient manpower and equipment available for rapid and continuous mixing and placing. Keep all necessary tools and materials ready and close at hand.

- C. Maintain temperatures of the foundation plate, supporting concrete, and grout between 40° and 90° F during grouting and for at least 24 hours thereafter or as recommended by the grout manufacturer, whichever is longer. Take precautions to minimize differential heating or cooling of baseplates and grout during the curing period.
- D. Take special precautions for hot weather or cold weather grouting as recommended by the manufacturer when ambient temperatures and/or the temperature of the materials in contact with grout are outside of the 60° and 90° F range.
- E. Install grout in a manner which will preserve the isolation between the elements on either side of the joint where grout is placed in the vicinity of an expansion or control joint.
- F. Continue all existing underlying expansion, control and construction joints through the grout.

3.04 CEMENTITIOUS NONSHRINK GROUT

- A. Non-shrink, cementitious, nonmetallic aggregate grout shall be used for column base plates, structural bearing plates, and all locations where the general term “non-shrink grout” is indicated on the Drawings. Use of this grout to support the bearing surfaces of machinery shall be as specified in **Section 26 05 29 – Hangars and Supports for Electrical Systems** or as detailed on the Drawings for specific locations or pieces of equipment. If guidance is not provided in locations noted above, use of non-shrink grout for equipment mounting shall be limited to equipment less than 750 pounds. Grout shall be placed and cured in accordance with the manufacturer's instructions.
- B. Non-shrink cementitious grout shall not be used as a surface patch or topping. Non-shrink cementitious grout must be used in confined applications only.

3.05 EPOXY GROUT FOR EQUIPMENT MOUNTING

- A. Prepare concrete surfaces of equipment pads as indicated in details on the Drawings and as required by the epoxy grout manufacturer. Epoxy grout for equipment mounting shall be placed and cured in accordance with the requirements of **Section 26 05 29 – Hangars and Supports for Electrical Systems**, details on the Drawings, and in conformance with manufacturer's recommendations.

3.06 CONCRETE REPAIR MORTAR

- A. Concrete repair materials and procedures shall be submitted for review to the Project Representative and shall be accepted prior to commencement of the repair work.

- B. Follow all manufacturer's instructions, including those for minimum and maximum application thickness, surface preparation and curing. Add aggregate as required per manufacturer's recommendations. Any deviations from the manufacturer's instructions shall be submitted for review to the Project Representative and shall be accepted prior to commencement of the work.

3.07 CEMENT GROUTS

- A. Mix in accordance with manufacturer's recommendations. Do not add cement, sand, pea gravel or admixtures without prior approval by the Project Representative.
- B. Avoid mixing by hand. Mixing in a mortar mixer (with moving blades) is required if recommended by the manufacturer. Pre-wet the mixer and empty excess water. Add premeasured amount of water for mixing, followed by the grout. Begin with the minimum amount of water recommended by the manufacturer and then add the minimum additional water required to obtain workability. Do not exceed the manufacturer's maximum recommended water content.
- C. Placements greater than 3-inch in depth shall include the addition of clean, washed pea gravel to the grout mix when approved by the manufacturer. Comply with the manufacturer's recommendations for the size and amount of aggregate to be added.
- D. Place grout into the designated areas in a manner which will avoid segregation or entrapment of air. Do not vibrate grout to release air or to consolidate the material. Placement shall proceed in a manner which will ensure the filling of all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.
- E. Place grout rapidly and continuously to avoid cold joints. Do not place cement grouts in layers. Do not add additional water to the mix (retemper) after initial stiffening.
- F. Just before the grout reaches its final set, cut back the grout to the substrate at a 45-degree angle from the lower edge of bearing plate unless otherwise approved by the Project Representative. Finish this surface with a wood float (brush) finish.
- G. Begin curing immediately after form removal, cutback, and finishing. Keep grout moist and within its recommended placement temperature range for at least 24 hours after placement or longer if recommended by the manufacturer. Saturate the grout surface by use of wet burlap, soaker hoses, ponding or other approved means. Provide sunshades as necessary. If drying winds inhibit the ability of a given curing method to keep grout moist, erect wind breaks until wind is no longer a problem or curing is finished.

3.08 CONCRETE GROUT

- A. Inspect slabs scheduled to receive concrete grout. Protect and keep the surface clean until placement of concrete grout.
- B. Clean and Roughen surface in accordance with preparation instructions above. Do not flush debris into structure drain piping.
- C. Saturate the concrete surface in accordance with instructions above. Place cement slurry immediately ahead of the concrete grout so that the slurry is moist when the grout is placed. Work the slurry over the surface with a broom until it is coated with approximately 1/16 to 1/8-inch thick cement paste. A bonding grout composed of 1-part portland cement, 1.5 parts fine sand, an approved bonding admixture and water, mixed to achieve the consistency of thick paint, may be substituted for the cement slurry.
- D. Place concrete grout to final grade using the scraper mechanism as a guide for surface elevation and to eliminate high and low spots. Unless specifically approved by the equipment manufacturer, mechanical scraper mechanisms shall not be used as a finishing machine or screed.
- E. Provide grout control joints as indicated on the Drawings.
- F. Steel trowel finish. Cure the concrete grout as specified for in **Section 03 30 31 – Cast-in-Place Concrete**.

END OF SECTION

SECTION 04 22 00 CONCRETE UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
1. Smooth, colored architectural concrete masonry units.
 2. Mortar and grout.
 3. Reinforcement and anchorage.
 4. Accessories
- B. Related Requirements:
1. **Section 03 45 00 – Precast Concrete**
 2. **Section 03 60 00 – Grouting**
 3. **Section 07 90 00 – Joint Protection**
 4. **Section 09 24 23 – Cement Stucco**

1.02 REFERENCES

- A. The references listed below are a part of this Section. 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.

REFERENCE	TITLE
ACI 117	Standard Specifications for Tolerances for Concrete Construction and Materials
ACI 530	Building Code Requirements for Masonry Structures
ACI 530.1	Specification for Masonry Structures
ASTM C270	Standard Specification for Mortar for Unit Masonry
ASTM C90	Specification for Load-bearing Concrete Masonry Units
ASTM C140	Methods of Sampling and Testing Concrete Masonry Units
ASTM E514	Standard Test Method for Water Penetration and Leakage Through Masonry
ASTM A153/A153M	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A615/A615M	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A666	Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip, Plate, and Flat Bar
ASTM C90	Standard Specification for Loadbearing Concrete Masonry Units
ASTM C91/C91M	Standard Specification for Aggregate for Masonry Mortar
ASTM C144	Standard Specification for Portland Cement
ASTM	

REFERENCE	TITLE
C150/C150M ASTM C270 ASTM C404 - ASTM C476 BIA Technical Notes No. 7 TMS 402/602	Standard Specification for Mortar for Unit Masonry Standard Specification for Aggregates for Masonry Grout Standard Specification for Grout for Masonry Water Penetration Resistance – Design and Detailing Building Code Requirements and Specification for Masonry Structures

1.03 SUBMITTALS

- A. Specified in **Section 01 33 00 - Submittal Procedures.**
- B. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type o fasteners, and accessories for brickwork support system.
- C. Samples: Submit four full size samples of concrete masonry units (two for pilaster and two for wall) to illustrate color and texture, and extremes of color range.
- D. Manufacturer's Qualification Statement.
- E. Manufacturer's Product Warranty Statement and Coverage.
- F. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Construction: Construct masonry in accordance with requirements of **ACI 530 and 530.1.**
- B. Special Inspection and Testing: Provide inspection and testing in accordance with the Building Code and as noted on Drawings and will be performed under provisions of **Section 01 40 00 – Quality Control Requirements.**
- C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.
- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- E. Mock-Up: Construct a masonry wall mock-up panel to represent the selected exterior masonry wall – including specified pilaster and wall units, color, texture characteristics, and bond pattern.

1. Construct wall at least 4 feet long by 4 feet high.
2. Locate on Site A with further direction from Project Representative.
3. Include bond pattern, joint profile and mortar colors for all face textures and colors.
4. Include reinforcement and weeps as indicated on drawings.
5. Erect entire mock-up with methods representative of standard, daily construction and in-progress cleaning practices.
6. Mock-up sample panel must receive acceptance by the Project Representative before proceeding with masonry installation.
7. Once accepted, mock-up sample panel will be used as the standard of quality for masonry work on the project.
8. Leave mock-up sample panel in place until project completion.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and handle architectural masonry materials as to prevent damage
 1. Deliver architectural masonry units wrapped and on wooden pallets
 2. Cover stacked masonry units with protective waterproof covering that will allow air circulation between blocks and pallets to prevent excessive moisture accumulation
 3. Ground and Polished Face masonry units to be packaged with protective foam membrane between block layers to minimize chipping.
- B. Store architectural masonry units in a location as to minimize handling, exposure to excessive moisture, contaminants, corrosion, and materials that could cause staining.
- C. Store mortar materials off the ground with waterproof covering and in a dry location.

1.06 PROJECT/SITE CONDITIONS

- A. Environmental Requirements (Cold Weather): Follow the requirements of the MIC Hot and Cold Weather Construction. Include the following construction requirements for cold weather procedures:
 1. When ambient air temperatures are above 40 degrees F cover tops of walls and masonry elements with plastic or canvas at end of workday to prevent water from entering masonry.
 2. When ambient air temperatures are below 40 degrees F and above 32 degrees F or temperature of masonry units is below 40 degrees F
 - a. Remove visible ice on masonry units before units are placed in the wall.
 - b. Do not lay masonry units having a temperature below 20 degrees F.
 - c. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F at the time of mixing.
 - d. Maintain mortar and grout temperatures above freezing until used in masonry.

- e. Cover tops of walls and masonry elements with weather resistive membrane at end of workday to prevent water from entering masonry.
 - 3. When ambient air temperatures are below 32 degrees F and above 25 degrees F or temperature of masonry units is below 40 degrees F:
 - a. Remove visible ice on masonry units before units are placed in the wall.
 - b. Do not lay masonry units having a temperature below 20 degrees F.
 - c. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F at the time of mixing.
 - d. Maintain mortar and grout temperatures above freezing until used in masonry.
 - e. Completely cover walls and masonry elements with weather resistive membrane at end of workday and keep covers in place for 24 hours.
 - 4. When ambient air temperature is below 25 degrees F and above 20 degrees F:
 - a. Remove visible ice on masonry units before units are placed in the wall.
 - b. Do not lay masonry units having a temperature below 20 degrees F.
 - c. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F at the time of mixing.
 - d. Maintain mortar and grout temperatures above freezing until used in masonry.
 - e. Use heat source on both sides of masonry under construction.
 - f. Install wind breaks when wind velocity is more than 15 mph.
 - g. Completely cover walls and masonry elements with insulated blankets or equivalent protection at end of workday and keep covers in place for 24 hrs.
 - 5. When ambient temperature is below 20 degrees F:
 - a. Remove visible ice on masonry units before units are placed in the wall.
 - b. Do not lay masonry units having a temperature below 20 degrees F.
 - c. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F at the time of mixing.
 - d. Maintain mortar and grout temperatures above freezing until used in masonry.
 - e. Provide an enclosure for the masonry under construction.
 - f. Use heat sources to maintain temperatures above 32 degrees F within the enclosure.
 - g. Maintain masonry temperature above 32 degrees F for 24 hours after construction by enclosure with supplementary heat, electric heating blankets, infrared heat lamps, or other acceptable methods.
- B. Environmental Requirements (Hot Weather): Follow the requirements of the MIC Hot and Cold Weather Construction. Include the following construction requirements for hot weather procedures:
- 1. When ambient temperature is above 115 degrees F or ambient air temperature is above 105 degrees F and wind velocity exceeds 8 mph:
 - a. Shade materials and mixing equipment from direct sunlight.
 - b. Maintain sand piles in damp loose condition.

- c. Provide necessary conditions and equipment to produce mortar and grout having temperatures below 120 degrees F.
 - d. Use cool mixing water for mortar and grout.
 - e. Maintain temperatures of mortar and grout below 120 degrees F.
 - f. Flush mixer, mortar and grout transport container, and mortarboards with cool water before contact with mortar or grout.
 - g. Maintain mortar consistency by re-tempering with cool water.
 - h. Use mortar within 2 hours of initial mixing.
 - i. Fog spray all newly constructed masonry until damp, at least three times a day until the masonry is 3-days old.
2. When ambient temperature is above 100 degrees F or ambient air temperature is above 90 degrees F and wind velocity exceeds 8 mph:
- a. Maintain sand piles in damp loose condition.
 - b. Provide necessary conditions and equipment to produce and maintain mortar and grout having temperatures below 120 degrees F.
 - c. Maintain mortar and grout temperatures below 120 degrees F.
 - d. Flush mixer, mortar and grout transport container, and mortarboards with cool water before contact with mortar or grout.
 - e. Maintain mortar consistency by re-tempering with cool water.
 - f. Use mortar within 2 hours of initial mixing.
 - g. Fog spray all newly constructed masonry until damp, at least three times a day until the masonry is three days old.

1.07 WARRANTY

- A. Provide manufacturer's written warranty against defects in materials and workmanship and agreeing to repair or replace components that fail during the Warranty Period.
- 1. The Warranty Period for work of this Section is five (5) years commencing on the date of Substantial Completion.

PART 2 PRODUCTS

2.01. MANUFACTURERS

- A. Concrete Masonry Units – General:
- 1. Provide wall concrete masonry units as indicated with dimensions of 16 inches long by 8 inches deep by 8 inches high, nominal; 15-5/8 inches long by 7-5/8 inches deep by 7-5/8 inches high as well as 8 inches long by 8 inches deep by 8 inches high, nominal; 7-5/8 inches long by 7-5/8 inches deep by 7-5/8 inches high. Provide precast concrete wall cap units as indicated on drawings with actual dimensions of 23-3/4 inches long by 11 inches deep by 3-1/2 inches high.
 - 2. Provide pilaster concrete masonry units as indicated with dimensions of 16 inches long by 16 inches deep by 8 inches high, nominal; 15-5/8 inches long by 15-5/8 inches deep x 7-5/8 inches high, actual. Provide precast concrete

- pilaster cap units as indicated on drawings with actual dimensions of 20-3/8 inches long by 20-3/8 inches deep by 3-5/8 inches high.
3. Provide special masonry units for bond beams, control and expansion joints, and lintels.
 4. Hollow and solid load-bearing block: **ASTM C-90**, normal weight, 125 pounds per cubic foot dry weight minimum.
 5. Exposed Faces: Manufacturer's standard gray color and smooth, molded finish texture.
 6. Pattern and layout shall be as shown on drawings.
- B. Acceptable Manufacturers:
1. CEMEX USA Architectural Block
 2. Bay Sand & Gravel Co., 5228 Shilshole Ave NW, Seattle, WA 98107; phone: (206) 784-1234
 3. Mutual Materials, 4302 S 104th Pl, Tukwila, WA 98178; phone: (425) 452-2400
 4. Masons Supply Company, 115 S Dawson St, Seattle, WA 98108; phone: (206) 767-4645
 5. The Concrete Products Group; Spec-Brik:
www.concreteproductsgroup.com/#sle.
 6. Substitutions: See **Section 01 60 00 - Product Substitutions**.
 - a. Products of equal quality must be submitted and approved by Project Representative at least ten (10) days prior to bid date

2.02 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: **ASTM C91/C91M**, Type N.
- B. Portland Cement: **ASTM C150/C150M**, Type I; color as required to produce approved gray color.
- C. Mortar Aggregate: **ASTM C144**.
- D. Grout Aggregate: **ASTM C404**.
- E. Water: Clean and potable.

2.03 ANCHORAGE AND REINFORCING

- A. Reinforcing Steel: **ASTM A615/A615M**, Grade 60 (60,000 psi) (420 MPa), deformed billet bars; galvanized.
- B. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

2.04 ACCESSORIES

- A. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Full-Height Airspace Maintenance and Drainage Material: Mesh panels, fitted between masonry ties.
- B. Weeps:
 - 1. Type: Polyester mesh.
 - 2. Color(s): Gray
- C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.05 MORTAR AND GROUT MIXING

- A. **Mortar for Unit Masonry: ASTM C270**, using the Proportion Specification.
- B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).
- C. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 INSPECTION

- A. Prior to the start of masonry construction, the Contractor shall verify:
 - 1. Foundations are constructed with tolerances conforming to **ACI 117**.
 - 2. Reinforcing dowels are positioned in accordance with Project Drawings.
 - 3. Verify items provided by other Sections of the Work are properly sized and located.
- B. If conditions are not met notify the Project Representative.

3.02 PREPARATION

- A. Establish Lines, Levels, and Coursing:
 - 1. Protect lines from disturbance.
 - 2. Use non-corrosive materials in contact with masonry.
- B. Surface Preparation: Prior to placing masonry units remove, loose aggregate or any other materials that would prevent mortar from bonding to the foundation.

3.03 COURSING AND BONDING

- A. Placement: Place masonry units to lines and levels indicated on plans.
- B. Uniformity: Maintain masonry coursing and horizontal joints of uniform width and thickness.
- C. Bond Patterns: Place masonry units in running bond pattern unless otherwise noted on plans.
- D. Course Height: Course one masonry unit and one mortar joint to equal 8 inches (4 inches for $\frac{1}{2}$ high units)

3.04 PLACING

- A. Bed and Head Joints:
 - 1. Joint Thickness:
 - a. Construct $\frac{3}{8}$ -inch bed and head joints unless otherwise indicated.
 - b. Construct bed joint at starting course on foundation not less than $\frac{1}{4}$ inch and not more than $\frac{3}{4}$ inch.
 - 2. Fill holes not specified in exposed and below grade masonry with mortar.
 - 3. Tool head and bed joints concave unless below grade or above ceiling height and to be concealed.
 - a. Use tool with large enough radius that joint is not raked free of mortar.
 - 4. Remove masonry protrusions extending $\frac{1}{2}$ inch or more into cells or cavities to be grouted.
- B. Unit Placement:
 - a. Lay concrete masonry units with bed and head joints filled from the faces of the units to a distance in not less than the thickness of the face shell.
 - b. Vertical cells to be grouted are aligned and unobstructed openings for grout must be provided in accordance with drawings.
 - 2. Keep cavity airspace and weep holes clean of mortar, clean out promptly if mortar falls into cavity airspace or plugs weep holes.
 - 3. Remove excess mortar
 - a. Protect wall from mud splatter and mortar droppings.
 - b. Place masonry units such that mortar does not run down the face of the wall or smear the masonry face.
 - 4. Adjustments:
 - a. Do not shift or tap masonry units after mortar has taken initial set.
 - b. Where adjustments must be made, remove mortar and replace.
 - 5. Protection: Protect wall cavities during construction to prevent rainwater saturation and excessive moisture accumulation.

3.05 TOLERANCES

- A. Erect masonry within the following tolerances from specified dimensions of elements:

1. In cross-section or elevation: minus $\frac{1}{4}$ inch, plus $\frac{1}{2}$ inch
2. Mortar joint thickness:
 - a. Bed joints: plus or minus $\frac{1}{8}$ inch
 - b. Head joints: plus $\frac{3}{8}$ inch to minus $\frac{1}{4}$ inch
 - c. Collar joints: plus $\frac{3}{8}$ inch to minus $\frac{1}{4}$ inch

B. Elements

1. Variation from level:
 - a. Bed joints: plus or minus $\frac{1}{4}$ inch in 10 feet; plus or minus $\frac{1}{2}$ inch maximum.
 - b. Top surface of bearing walls: plus or minus $\frac{1}{4}$ inch in 10 feet; plus or minus $\frac{1}{2}$ inch maximum.
2. Variation from plumb: plus or minus $\frac{1}{4}$ inch in 10 feet; plus or minus $\frac{3}{8}$ inch in 20 feet; plus or minus $\frac{1}{2}$ inch max.
3. True to line: plus or minus $\frac{1}{4}$ inch in 10 feet; plus or minus $\frac{3}{8}$ inch in 20 feet; plus or minus $\frac{1}{2}$ inch maximum.
4. Alignment of columns and walls (bottom versus top):
 - a. Bearing: plus or minus $\frac{1}{2}$ inch.
 - b. Non-bearing: plus or minus $\frac{3}{4}$ inch

C. Location of elements:

1. Indicated in plan: plus or minus $\frac{1}{2}$ inch in 20 feet; plus or minus $\frac{3}{4}$ inch maximum
2. Indicated in elevation: plus or minus $\frac{1}{4}$ inch in story height; plus or minus $\frac{3}{4}$ inch max.

D. Notification: If the above conditions cannot be met, notify Project Representative.

3.06 CUTTING AND FITTING

- A.** Cut and fit for pipes, conduit, and sleeves. Coordinate with other sections of work to provide correct size, shape, and location.

3.07 CLEANING

- A.** Remove excess mortar and mortar droppings.
1. In-Progress Cleaning: Clean unit masonry as work progresses within seven days by dry brushing to remove excess mortar and smears before tooling joints.
 2. Final Cleaning: Clean exposed masonry as follows:
 - a. Clean masonry before installing windows, door, finished flooring, metal fixtures, hardware, light fixtures, roofing materials and other non-masonry items.
 - b. If already installed, protect from cleaning solution with polyethylene film or waterproof masking tape.
 - c. Remove large mortar particles by hand with wooden paddles and non-metallic tools.

- d. Always test cleaner on sample panel or small area to demonstrate to the Project Representative products, procedures, and stain suitability of each type of stain.
 - e. Materials: Clean masonry units with the following masonry cleaners:
 - 1) Use Sure Klean Burnished Custom Masonry Cleaner, by Prosoco as per manufacturer's instructions and cleaning procedures
- B. Clean soiled surfaces with cleaning solution.
- C. Use non-metallic tools in cleaning operation.

3.08 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 05 14 HOT-DIP ZINC COATING

PART 1 GENERAL

1.01 SUMMARY

- A. This section specifies hot-dip zinc coating.

1.02 QUALITY ASSURANCE

- A. 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.

REFERENCE	TITLE
ASTM A123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A143	Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A384	Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
ASTM A385	Providing High-Quality Zinc Coatings (Hot-Dip)
ASTM A780	Repair of Damaged Hot-Dip Galvanized Coatings
MILSPEC DOD-P-21035	Paint, High Zinc Dust Content, Galvanizing Repair

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with each paragraph check-marked to indicate compliance or marked to indicate requested deviations.
- C. The following information shall be provided:

1. Zinc dust-zinc oxide coating manufacturer's product data showing conformance to the specified product.
2. Manufacturer's recommendation for application of zinc dust-zinc oxide coating.
3. Coating applicator's Certificate of Compliance that the hot-dip galvanized coating meets or exceeds the specified requirements of **ASTM A123** or **A153**, as applicable.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Zinc Coating: Zinc coating material shall be as specified in **ASTM A123** and **ASTM A153**, as applicable.
- B. Zinc Dust-Zinc Oxide Coating: Zinc dust-zinc oxide coating shall conform to **MILSPEC DOD-P-21035**. Coating shall be as manufactured by Z.R.C. Chemical Products Co., or Galvicon Co.

2.02 FABRICATION REQUIREMENTS

- A. Fabrication practices for products to be galvanized shall be in accordance with applicable portions of **ASTM A143**, **ASTM A384**, and **ASTM A385**.

PART 3 EXECUTION

3.01 APPLICATION

- A. Steel members, fabrications and assemblies shall be galvanized after fabrication in accordance with **ASTM A123**.
- B. Structural steel connection bolts, screws, nuts, washers shall be hot-dip galvanized per **ASTM A153**.

3.02 COATING REQUIREMENTS

- A. Coating weight shall conform to paragraph 5.1 of **ASTM A123** or Table 1 of **ASTM A153**, as appropriate.

3.03 REPAIR OF DEFECTIVE GALVANIZED COATING

- A. Where zinc coating has been damaged after installation, substrate surface shall be first cleaned and then repaired with zinc dust-zinc oxide coating in accordance with **ASTM A780**. Application shall be as recommended by the zinc dust-zinc oxide coating manufacturer. Coating shall consist of multiple coats to dry film thickness of 8 mils.

- B. Items not physically damaged, but which have insufficient or deteriorating zinc coatings, and items damaged in shipment or prior to installation, shall be removed from the project site for repair by the hot-dip zinc coating method.

END OF SECTION

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SECTION 05 05 20 ANCHOR BOLTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: Bolts and all-thread rods used to attach structural elements and equipment to concrete and concrete masonry. Included are cast-in-place and post-installed anchors (adhesive systems and wedge type expansion anchors), nuts and washers.
- B. Cast-in-place and post-installed anchors shall be Type 316 stainless steel unless noted otherwise.

1.02 QUALITY ASSURANCE

- A. The references listed below are a part of this Section. 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.

REFERENCE	TITLE
ACI/CRSI	Adhesive Anchor Installer Certification Program
ACI 318	Building Code Requirements for Structural Concrete
ASTM A193	Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A320	Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service
ASTM A563	Carbon and Alloy Steel Nuts
ASTM F593	Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F594	Stainless Steel Nuts
ASTM F844	Washers, Steel, Plain (Flat), Unhardened for General Use
ASTM F1554	Anchor Bolts, Steel, 36, 55, 105-ksi Yield Strength
IBC	International Building Code with local amendments
ICC ES Report	International Code Council Evaluation Service Reports
AC 193	Acceptance Criteria for Mechanical Anchors in Concrete Elements
AC 308	Acceptance Criteria for Adhesive Anchors in Concrete Elements

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 10 – Submittal Procedures.**
- B. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with each paragraph check-marked to indicate compliance or marked to indicate requested deviations.
- C. Provide the following Submittals:
 - 1. Anchor bolt placement plans.
 - 2. Anchor bolt, nut, and washer material information, including material certifications.
 - 3. Record copy of design calculations and details showing the required diameter, length, embedment, edge distance, confinement, anchor reinforcement, anchor bolt sleeves, connection redesign, and other conditions, stamped and signed by a Professional Engineer currently registered in the state of Washington. Calculations shall comply with the provisions of **ACI 318-14**, Chapter 17.
 - 4. Product Data:
 - a. **ICC Evaluation Service Reports** for post-installed adhesive type anchors and expansion (wedge type) anchors when allowed. Products shall be approved for use in cracked concrete in high seismic areas (Seismic Design Category D, E and F).
 - b. Product data indicating load capacity charts/calculations.
 - c. Chemical resistance.
 - d. Temperature limitations.
 - e. Manufacturers written installation instructions.
 - 5. Installer certification for horizontal or upwardly inclined adhesive anchors in accordance with ACI/CRSI Adhesive Anchor Installer Certification Program.

1.05 QUALITY ASSURANCE

- A. The diameter and capacity of post-installed concrete anchors shall be as recommended or required by the equipment or machinery manufacturer, including any recommended or required adjustment for seismic conditions listed in **Section 01 73 24 – Design Requirements for Non-Structural Components and Non-Building Structures**. In case of conflicting or ambiguous recommendations or requirements, the most stringent shall apply. Verify that the capacities and configurations conform to the Drawings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Anchor bolt and anchor materials shall be as specified in the following table:

MATERIAL	SPECIFICATION
Stainless Steel Anchor Bolts	ASTM A193 or ASTM A320 , Type 316
Stainless Steel Threaded Rods	ASTM F593 , Type 316
Stainless Steel Nuts and Washers	ASTM A194 Heavy Hex Nuts and Washers, Type 316 ASTM F594 Heavy Hex Nuts at Adhesive Anchors Type 316
Carbon Steel Anchor Bolts	ASTM A307 or ASTM F1554 , Grade 36, Hot Dip Galvanized
High-Strength Carbon Steel Anchor Bolts	ASTM F1554 , Grade 55, Weldable per Supplementary Requirement S1, Hot Dip Galvanized
Carbon Steel Nuts and Washers	ASTM A563 and ASTM F844 , Heavy Hex, Hot-Dip Galvanized
Carbon Steel Headed Anchor Studs (HAS)	ASTM A29
Carbon Steel Deformed Bar Anchors (DBA)	ASTM A496 or A615
Concrete Adhesive Anchors	Hilti "HIT-RE 500v3", Simpson "SET-XP" with Type 316 Stainless Steel threaded rods
Concrete Expansion (wedge) Anchors *	Hilti "KWIK BOLT TZ", Type 316 Stainless Steel

**Post installed anchors shall always be an adhesive type anchor system except where noted otherwise or when Contractor makes a request for a specific application and Project Representative approves.*

2.02 STAINLESS STEEL FASTENER LUBRICANT (ANTI-SEIZING)

- A. Anti-seizing Lubricant for Stainless Steel Threaded Connections:
1. Formulated to resist washout.
 2. Acceptable manufacturers are Bostik, or Saf-T-Eze.

2.03 ANCHOR BOLT SLEEVES

- A. Provide anchor bolt sleeves as indicated on design drawings and as required by equipment manufacturer's design.

1. Provide high density polyethylene plastic sleeves of single unit construction with deformed sidewalls such that the concrete and grout lock in place.
2. The top of the sleeve shall be self-threading to provide adjustment of the threaded anchor bolt projection.
3. Acceptable manufacturers are Contec or Wilson.

PART 3 EXECUTION

3.01 GENERAL

- A. Anchor bolts shall be cast-in-place anchors unless post-installed anchors are specified or indicated on the Drawings.
- B. Grouting of anchor bolts using plastic sleeves with non-shrink or epoxy grout, where specified, shall be in accordance with **Section 03 60 00 – Grouting**.
- C. The threaded end of anchor bolts and all-thread rods shall be long enough to project through the entire depth of the nut and if too long, shall be cut off at ½-inch beyond top of nut and ground smooth.

3.02 CAST-IN-PLACE ANCHOR BOLTS

- A. Anchor bolts to be embedded in concrete shall be placed accurately and held in correct position using templates while the concrete is placed.
- B. After anchor bolts have been embedded, their threads shall be protected by grease and the nuts run on.

3.03 ADHESIVE ANCHOR BOLTS

- A. Note that adhesive anchors shall not be substituted for cast-in-place anchor bolts unless the adhesive anchors have been specified or indicated on the Drawings, or approval has been obtained from the Project Representative that substitution of adhesive anchors is acceptable for the specific use and location. Use of adhesive anchors shall be subject to the following conditions:
 1. Limit to locations where intermittent or continuous exposure to the following is extremely unlikely:
 - a. Acid concentrations higher than 10 percent
 - b. Chlorine gas
 - c. Machine or diesel oils
 2. Limit to applications where exposure to the following is extremely unlikely:
 - a. Fire
 - b. Concrete or rod temperature above 120 degrees F
 3. Overhead applications (such as pipe supports) shall not be allowed unless approved by the Project Representative and installation is by an Installer specially certified for overhead applications.
 4. Approval from the Project Representative for specific application and from supplier of equipment to be anchored, if applicable.

5. Anchor diameter and material shall be per Contract Documents or equipment manufacturer's specifications. Anchor shall be threaded or deformed the full length of embedment and shall be free of rust, scale, grease, and oils.
6. Embedment depth shall be as specified or as required by the equipment manufacturer.
7. Follow the anchor system manufacturer's installation instructions.
8. Holes shall have rough surfaces created by using a hammer drill with carbide bit. Core drilled holes are not allowed.
9. Holes shall be blown clean with oil-free compressed air and be free of dust or standing water prior to installation. Follow additional requirements of the adhesive manufacturer.
10. Concrete and air temperature shall be compatible with curing requirements of adhesives per adhesive manufacturer's instructions. Anchors shall not be placed in concrete when the temperature is below 25 degrees F.
11. Anchors shall be left undisturbed and unloaded for full adhesive curing period, which is based on temperature of the concrete.

3.04 EXPANSION ANCHORS

- A. Expansion (wedge type) anchors shall not be substituted for cast-in-place anchor bolts or adhesive anchors unless approved by the Project Representative for a specific application. Use of expansion anchors shall be subject to conditions 4 through 9 as specified above for adhesive anchors. Expansion anchors shall not be used in a submerged condition or in mounting of equipment subject to vibration or cyclic motion.

3.05 REINFORCING STEEL CONFLICTS WITH POST-INSTALLED ANCHOR INSTALLATION

- A. When reinforcing steel is encountered in the drill path, slant drill to clear obstruction and provide beveled washer to match angle of anchor. Drill shall not be slanted more than 10 degrees.
- B. Where slanting the drill does not resolve the conflict, notify the Project Representative and resolve the conflict to the satisfaction of the Project Representative.
- C. Abandoned post-installed anchor holes shall be cleaned and filled with non-shrink grout and struck off flush with adjacent surface.
- D. The costs of determining and executing the resolution shall be borne by the Contractor. The determination and execution of the resolution shall not result in additional cost to the City.
- E. In order to avoid or resolve a conflict, locate embedded reinforcing steel using non-destructive methods and/or redesign the attachment.
 1. Redesign shall be done by the Contractor's Professional Engineer currently registered in the state of Washington.

2. Calculations and details for redesign shall be submitted in accordance with **Section 01 33 00 – Submittal Procedures.**

END OF SECTION

SECTION 05 05 23 METAL FASTENINGS

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies all metal fastenings, complete with washers and nuts, except cast-in concrete anchors and post-installed anchors.
- B. Metal fastening systems required to secure the various metal parts together and provide a complete installation are generally indicated on the Drawings. Where the fastening design is absent, or insufficiently detailed to complete the installation, provide the fastening design and submit for approval.
- C. The tabulation of items herein is not intended to be all inclusive, and it shall be the Contractor's responsibility to provide all metalwork and castings shown, specified, or which can reasonably be inferred as necessary to complete the project.

1.02 QUALITY ASSURANCE

- A. This Section incorporates by reference the latest revisions of the embedded standard referenced herein. In case of conflict between the requirements of this Section and those of a listed document, the requirements of this Section shall prevail.

REFERENCE	TITLE
ASTM A563	Carbon and Alloy Steel Nuts
ASTM A780	Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM B695	Coatings of Zinc Mechanically Deposited on Iron and Steel
ASTM F436	Hardened Steel Washers
ASTM F593	Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F594	Stainless Steel Nuts
ASTM F959	Compressible-Washer-Type Direct Tension Indicator for Use with Structural Fasteners
ASTM F1136	Zinc/Aluminum Corrosion Protective Coatings for Fasteners
ASTM F2329	Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
ASTM F3125	High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength
RCSC 2014	Specification for Structural Joints Using High-Strength Bolts

1.03 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Provide the following submittals:
 - 1. Detailed shop drawings.
 - 2. Preparation and installation or application instructions, as appropriate.
 - 3. Certificates of Compliance that products meet chemical and mechanical requirements of standards specified.
 - 4. Manufacturer's inspection test report results for production lot(s) provided, to include:
 - a. Tensile strength.
 - b. Yield strength.
 - c. Reduction of area.
 - d. Elongation and hardness.
 - 5. Certified mill test reports for bolts and nuts:
 - a. Name and address of manufacturer.
 - b. Bolts correctly marked.
 - c. Marked bolts and nuts used in required mill tests and manufacturer's inspection tests.
 - 6. Direct tension indicators (DTIs): Provide manufacturer's test report meeting requirements of **ASTM F959**.
 - 7. Tension control (TC) bolts: Provide manufacturer's test report meeting requirements of **ASTM F3125**.

1.04 DELIVERY AND STORAGE

- A. Protect fasteners from dirt and moisture. Do not remove lubricant from bolts and nuts.

PART 2 PRODUCTS

2.01 MATERIALS

- A. High-Strength Bolts:
 - 1. Conventional bolts: **ASTM F3125**, Grade A325, or Grade A490, as specified. Manufacturers:
 - a. LeJeune Bolt Company, Burnsville, MN.
 - b. Nucor Fastener, Saint Joe, IN.
 - c. Haydon Bolts, Philadelphia, PA.
 - d. Vermont Fasteners Manufacturing, Swanton, VT.
 - 2. Twist-off-type tension-control bolts: **ASTM F3125**, Grade F1852, or Grade F2280, as specified. Manufacturers: Same as above.
 - 3. Stainless bolts: **ASTM F593**, CW1, or CW2, as specified. Manufacturers:
 - a. Eastwood Manufacturing, Houston, TX.
 - b. FM Stainless LLC, Ellijay, GA
 - c. USA Fastener Group Inc., Houston, TX
 - 4. Nuts: (Heavy Hex)

- a. Carbon and alloy steel: Nut grade and finish shall conform to **ASTM A563**.
- b. Stainless steel: **ASTM F594**.
- 5. Washers:
 - a. DTIs or load indicator washers for conventional bolts: **ASTM F959**.
Manufacturers:
 - 1) TurnaSure LLC, Langhorne, PA; DTIs
 - 2) Applied Bolting Technology Products, Ludlow, VT; DTIs standard or Squirter type.
 - b. Hardened steel washers: **ASTM F436**.
 - c. Stainless steel washers: Type 316.

2.02 FABRICATION

- A. Bolt assembly furnish:
 - 1. A325 bolt assemblies: plain, or hot-dip zinc coated per **ASTM F2329**, or Zn/Al inorganic per **ASTM F1136** Grade 3.
 - 2. F1852 bolt assemblies: plain, or mechanically coated per **ASTM B695**.
 - 3. A490 bolt assemblies: plain, or Zn/Al inorganic per **ASTM F1136** Grade 3.
 - 4. F2280 bolt assemblies: plain.
 - 5. Galvanize components of bolted assemblies separately before assembly.
- B. Slip critical bolted connections:
 - 1. Mask faying surfaces of slip critical (SC) bolted connections to be shop painted as specified in **Section 09 90 00 – Painting and Coating**.
 - 2. Roughen galvanized faying surfaces with hand wire brushing.

2.03 STAINLESS STEEL FASTENER LUBRICANT (ANTI-SEIZING)

- A. Where stainless steel nuts and threaded fasteners are used, apply anti-seizing lubricant to the threads prior to making up the connections. Lubricant shall be manufactured and labeled for use with stainless steel and shall contain substantial amounts of molybdenum disulfide, graphite, mica, talc, or copper.

PART 3 EXECUTION

3.01 GENERAL

- A. Install high-strength bolts per Specification for Structural Joints Using High-Strength Bolts.
- B. Protect dissimilar metals from galvanic corrosion by means of pressure tapes, coatings, or isolators.
- C. Provide beveled washers where mating surface is not square with the bolt.

3.02 INSTALLATION OF HIGH-STRENGTH BOLT

- A. Tighten in accordance with AISC Specification for Structural Joints Using High-Strength Bolts.
- B. Hardened washers:
 - 1. Provide at locations required by Washer Requirements section of AISC Specification for Structural Joints Using High-Strength Bolts, to include slip-critical connections using slotted or oversized holes or Grade A490 bolts.
 - 2. Use beveled style and extra thickness where required by AISC Specification.
 - 3. Use square or rectangular beveled washers at inner flange surfaces of American Standard beams and channels.
 - 4. Do not substitute DTIs for hardened flat washers required at slotted and oversized holes.
- C. Bearing-type connections not fully tensioned (N, X): Tighten to snug tight condition. Use hardened washer over slotted or oversize holes in outer plies.
- D. Fully tensioned bolted connections:
 - 1. Use DTIs or TC bolts at slip-critical (SC) and fully tensioned bearing-type connections.
 - 2. DTIs:
 - a. Position within bolted assembly in accordance with **ASTM F959**.
 - b. Install bolts, with DTIs plus hardened washers as required, in all holes of an assembly and tighten until plies are in firm contact and fasteners are uniformly snug tight.
 - 3. Final tighten bolts, beginning at most rigid part of bolted connection and progressing toward free edges, until final twist-off of TC bolts or until DTIs have been compressed to an average gap equal to or less than shown in Table 2, **ASTM F959**.

3.03 MISFITS AT BOLTED CONNECTIONS

- A. Where misfits in erection bolting are encountered, immediately notify Project Representative for approval of one of the following methods of corrections:
 - 1. Ream holes that must be enlarged to admit bolts and use oversize bolts.
 - 2. Plug weld misaligned holes and redrill holes to admit standard size bolts.
 - 3. Drill additional holes in connection, conforming to AISC Standards for bolt spacing and end and edge distances, and add additional bolts.
 - 4. Reject member containing misfit, incorrect sized, misaligned holes and fabricate new member to ensure proper fit.
- B. Do not enlarge incorrectly sized or misaligned holes in members by burning or by use of drift pins.

3.04 FIELD QUALITY CONTROL

- A. Inspect:
 - 1. Marking identification and conformance to ASTM standards.
 - 2. Alignment of bolt holes.
 - 3. Placement, type, and thickness of hardened washers.

4. Tightening of bolts.
- B. Bearing-type connections not fully tensioned (N, X): Snug tight condition with piles of joint in firm contact.
 - C. Fully tensioned bearing and slip critical connections:
 1. Conduct pre-installed test.
 2. Monitor installation and tightening of DTIs or TC bolts.
 3. Monitor condition of faying surfaces for slip critical connections.
 - D. Pre-installation test:
 1. Conduct jobsite test prior to start of work using a bolt tension measuring device.
 2. Select representative sample of not less than three bolts of each diameter, length, and grade.
 3. Include DTIs and flat hardened washers as required to match actual connection assembly.
 4. Conduct test in accordance with Specification for Structural Joints Using High-Strength Bolts.
 - E. Nondestructive testing (NDT) report: Prepare and submit a written NDT report identifying location of inspected bolted connections and summary of corrections as required to meet code acceptance criteria.
 - F. Defective connections: Correct and re-inspect defective and improperly tightened high-strength bolted connections. Retest fully tensioned bolts as necessary to demonstrate compliance of completed work.

3.05 GALVANIZING REPAIR

- A. Galvanized surfaces that are abraded or damaged at any time after the application of the zinc coating shall be repaired in accordance with the recommendations of ASTM A780 as required by the Project Representative.

END OF SECTION

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SECTION 05 07 00 DECORATIVE METAL PANEL

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes patterned perforated decorative metal panels utilized on top of enclosure walls as well as on access doors and gates on Site A and Site B.
- B. Related Sections:
 - 1. **Section 01 33 00 – Submittal Procedures.**
 - 2. **Section 01 78 00 – Closeout Submittals.**
 - 3. **Section 03 30 31 – Cast-in-Place Concrete.**
 - 4. **Section 05 05 20 – Anchor Bolts**
 - 5. **Section 09 90 00 – Painting and Coating**

1.02 REFERENCES

- A. References, General: Versions of the following standards current as of the date of issue of the project or required by applicable code apply to the Work of this Section.
- B. Aluminum Association (AA):
 - 1. Aluminum Standards and Data.
- C. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA 2604 - High Performance Organic Coatings on Aluminum Extrusions and Panels.
- D. Consumer Product Safety Commission (CPSC):
 - 1. Public Playground Safety Handbook.
- E. International Association of Plumbing & Mechanical Officials (IAPMO):
 - 1. IAPMO-UES Uniform Evaluation Services Evaluation Report for Decorative Perforated Metal Panels.
- F. Worldwide Burr Technology Committee Standard (WTB).
 - 1. WBTC-STD14.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product specified.
- B. Shop Drawings:
 - 1. For each type of panel and accessory, showing material, thickness, dimensions, cutouts and penetrations, finish, and other information necessary to describe work.

2. Size and spacing of fasteners, mounting clips, and other panel attachment devices.
 3. Panel Layout Drawings: Show panel layout and method of support.
- C. Manufacturer Instructions:
1. Delivery, storage, and handling.
 2. Installation.
 3. Cleaning and repair.
- D. Manufacturer/Fabricator's Qualifications: Submit manufacturing products specified in this Section with minimum five years documented experience of project related work.
- E. Samples: In pattern shown on drawings with specified material and thickness, not less than 24-by-24 inches in size and showing geometry type that represents the specified pattern. Include finish sample(s) as well to represent exact specified finish.
- F. Delegated Design Submittal: Include analysis data signed and sealed by the qualified Professional Engineer licensed in Washington State responsible for their preparation.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years documented experience.
- B. Installer: Experienced Installer with a record of successful installations of similar type and size to that specified.
- C. Professional Engineer Qualifications: Documented experience with providing delegated-design engineering services of the kind required by this Section, including documentation that engineer is licensed in Washington State.
- D. Mock-Up Sample:
1. Install Site A (S 8th St and Court A) in location acceptable to Project Representative.
 2. Size: As shown in Drawings.
 3. Accepted mock-ups may remain as part of Work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's instructions. Protect against damage.
- B. Coordinate schedule with concrete masonry unit pilaster and wall as well as precast concrete pilaster and wall cap installation.

1.06 WARRANTY

- A. Submit panel manufacturer's limited warranty against defects in material and workmanship:
 - 1. Standard Factory-Applied Coatings to Aluminum Panels: Ten years.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design structure to withstand design loads.
- B. Structural Requirements: Engineer panel assemblies and supports to withstand design loads.
- C. Thermal Movement: Allow for 180 deg. F thermal variation.
- D. At locations indicated on Drawings, comply with Consumer Product Safety Commission (CPSC) requirements with regards to entanglement; impalement; entrapment; and sharp points, corners, and edges.

2.02 MANUFACTURERS

- A. Manufacturer: Parasoleil, <https://parasoleil.com/>, hello@parasoleil.com, 303-589-4524.
 - 1. Substitutions: See **Section 01 60 00 - Product Substitutions**.
 - a. Products of equal quality must be submitted and approved by Architect at least ten (10) days prior to bid date
 - b. Documentation that manufacturer has five years' experience manufacturing laser cut panels of type and quality specified and is licensed to produce copyrighted designs.
 - c. Documentation of three projects with similar types and quality of exterior laser cut panels including photographs of work, project address, and name and contact information for project designer, contractor, and owner.

2.03 METAL PANELS, GENERAL

- A. Provide complete engineered systems including panels and panel-mounting hardware.
- B. Provide system engineering services as follows:
 - 1. Panel thickness calibration.
 - 2. IAPMO-UES Product Certification.
 - 3. Finite Element Analysis.

2.04 METAL PANELS

- A. Manufacturer's custom laser-cut aluminum architectural panels.

- B. Nominal Size: As indicated on Drawings.
- C. Panel Thickness: 3/16 inch.
- D. Pattern: As indicated on Drawings.
- E. Finish: Factory-Applied Standard Powder Coat: Parasoleil Quality Standard
- F. Finish: Powder Coat System in "Bronze" color.
- G. Specifier: Visit the Parasoleil Finishes Library at <https://parasoleil.com/finishes> to see the full range of powder coat colors, textures, and gloss level to choose from including those below.
- H. Mounting System: As indicated on Drawings.
- I. Do not allow unsupported edges except as shown on approved Shop Drawings.
- J. Modify panels as required to meet project requirements.

2.05 MATERIALS:

- A. Aluminum: AA 5000 series, H32 temper.
- B. Galvanic Barriers: Types recommended by manufacturer for conditions of use.
- C. Shims: Non-staining type suitable for conditions of use.

2.06 FABRICATION

- A. Cutting and Cutouts: Cut metal with laser cutter capable of 1/16-inch tolerance. Remove burrs in accordance with WBTD recommended "Deburring & Edge Finishing Handbook" by LaRoux K. Gillespie, Level D, without magnification.
- B. Predrill holes for fasteners in factory to extent practical.
- C. Complete fabrication before applying finishes.

2.07 FINISHES

- A. Powder Coatings, Coating Finish Process: Dry system with a minimum 50 percent fluoropolymer resin, meeting performance requirements of **AAMA 2604** and the following:
 - 1. Product: AAMA-approved TGIC or HAA polyester powder coating.
 - 2. Dry Film Thickness, **ASTM D7091**: Not less than thickness applied to tested specimens meeting specified performance requirements, and as recommended by manufacturer for application.
 - 3. Specular Gloss, **ASTM D523** at 60 deg.: 35 percent, plus or minus 5 percent.
 - 4. Dry Film Salt Spray, ASTM B117: Minimum 3,000 hours.

- B. Anti-Graffiti Coating according to **SECTION 09 90 00 Painting and Coating**

2.08 ACCESSORIES

- A. Mounting Systems: Manufacturer's provided engineered clips and attachment devices. Provide powder coated, 1/8-inch-thick mild steel mounting hardware for wood or steel support structure.
- B. Fasteners: Fasteners: Manufacturer's provided self-drilling, self-tapping screws.
- C. Color: Color of exposed-to-view fasteners in surfaces with factory-applied finishes shall be compatible with panel finish.
- D. Size and Spacing: As shown on approved Shop Drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that conditions are ready for installation of panels. Correct defects before proceeding.

3.02 INSTALLATION

- A. Install plumb, level, square, and securely and in accordance with manufacturer's instructions.
- B. Factory-Painted Surfaces: Do not cut or weld in the field.
- C. Protect against contact between dissimilar metals.

3.03 PROTECTION AND REPAIRS

- A. Protect installed panels from damage.
- B. Damaged panels that cannot be repaired to Project Representative's satisfaction shall be removed and replaced with new panels.

END OF SECTION

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SECTION 05 50 00 METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies fabricated metal items and other miscellaneous metalwork, cover plates and frame, stainless steel, galvanized steel, aluminum, or metals with coating systems.

1.02 QUALITY ASSURANCE

- A. Referenced Standards: This Section incorporates by reference the latest revisions of the following documents. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
AISC	American Institute for Steel Construction
AISC 360	Specification for Structural Steel Buildings
ASCE 7	Minimum Design Loads and Associated Criteria for Buildings and Other Structures
ASTM A36	Structural Steel
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A123	Zinc (Hot-Dip Galvanize) Coatings on Iron and Steel Products
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A193	Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service, or Both
ASTM A240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A242	High-Strength Low-Alloy Structural Steel
ASTM A307	Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
ASTM A312	Seamless and Welded Austenitic Stainless steel Pipes
ASTM A320	Standard Specification for Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service
ASTM A325	Structural Bolt, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A500	Standard Specification for Cold-Formed Welded and

REFERENCE	TITLE
ASTM A563	Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A780	Carbon and Alloy Steel Nuts
ASTM A786	Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM B695	Standard Specification for Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates
ASTM F844	Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
AWS D1.1	Washers, Steel, Plain (Flat), Unhardened for General Use
AWS E70	Structural Welding Code of the American Welding Society
SSPS SP-5	Filler Material
	White Metal Blast Cleaning

B. Qualifications:

1. Welders:

- a. Certified by WABO in the last 12 months.
- b. Experience in the work being performed.

1.03 SUBMITTALS

A. Procedures: **Section 01 33 00 – Submittal Procedures.**

B. Qualifications.

C. Manufacturer's product data showing conformance to the Specifications.

D. Detailed Shop Drawings.

E. Welding procedures.

1.04 GENERAL

A. Observation of Work: The Project Representative shall have access to any fabrication site or shop for the purpose of observing fabrication of items, structures, equipment, piping, electrical and other components that will be used in or incorporated in the Work.

B. Notifications:

1. Start of Work: Notify the Project Representative in advance of the start of fabrication. For fabrication sites within 50 miles of the Project Site, provide 48 hours' notice. For fabrication sites greater than 50 miles from the Project Site, provide 14 days' notice.
2. Finish Work: Notify the Project Representative in advance of applying finish. For fabrication sites within 50 miles of the Project Site, provide 48 hours'

notice. For fabrication sites greater than 50 miles from the Project Site, provide 14 days' notice.

- C. The use of salvaged, reprocessed or scrap materials is not permitted.
- D. Shop and field welding shall conform to the requirements of AWS D1.1, AWS D1.6 minimum.
- E. Welding shall be performed by WABO certified welders.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel:

Sheets, plates and shapes	ASTM A36
Pipe	ASTM A53, Grade B
Bolts	ASTM A307, Grade A
Nuts	ASTM A563
Floor Plates	ASTM A786
Washers	ASTM F844

B. Stainless Steel:

Sheets and plates	ASTM A240, Type 304 or 304L
Pipe	ASTM A312, Type 304 or 304L
Bolts	ASTM A193 or A320, Type 304
Nuts	ASTM A194, Type 304
Washers	Type 304

2.02 ANCHORAGE AND ANCILLARY MATERIALS

- A. Provide components required for anchorage of fabrications.
- B. Fabricate anchors and related components of same material and finish as fabrication.
- C. Anchorage to concrete: in accordance with **Section 05 50 20 – Anchor Bolts**.
- D. Grout: As specified in **Section 03 60 00 – Grouting**.

2.03 LIFTING LUGS

- A. Individual equipment and each field disassemblable part weighing in excess of 50 pounds shall be fitted with lifting lugs for easy handling.

2.04 FASTENERS

- A. Anchor Bolts and Post-Installed anchors: As specified in **Section 05 50 20 – Anchor Bolts**. Metal Fastenings: As specified in **Section 05 05 23 – Metal Fastenings**.
- B. Finish: unless otherwise indicated, steel bolts, screws, nuts, washers and other steel fasteners shall be mechanically zinc-coated in accordance with **ASTM B695**, Class 50.
- C. Thread lubricant for stainless steel fasteners shall be where stainless steel bolts and threaded fasteners are used, apply anti-seizing lubricant to the threads prior to making up the connections. Lubricant: manufactured and labeled for use with stainless steel and shall contain substantial amounts of molybdenum disulfide, graphite, mica, talc or copper.

2.05 PIPE SLEEVES

- A. **ASTM A53**, Schedule 40 steel pipe sleeves with continuously welded 3/16" thick seep ring with an outside diameter three inches greater than the sleeve outside diameter. Hot dip galvanize in accordance with **ASTM A123** or **ASTM A153**.

2.06 U-CHANNEL CONCRETE EMBEDS

- A. Rolled **ASTM A240**, AISI Type 316 stainless steel, 0.105 inch thickness, 1 5/8" wide x 1 3/8" deep, with stainless steel anchors at 10 inch maximum spacing. Provide Styrofoam inserts and end caps.
- B. Nut and Bolt and Hardware: Type 316 stainless steel, 5/8" minimum diameter unless otherwise noted. Manufacturer's standard components compatible with the concrete embeds.
- C. Acceptable manufacturers:
 - 1. Power-Strut, PS 349 Series.
 - 2. B-Line Systems, B32 Series.
 - 3. Halfen Anchoring Systems, Type 4141HTA.
 - 4. Approved Equal.

2.07 FLOOR PLATE (CHECKERED PLATE)

- A. Minimum Thickness:
 - 1. Galvanized steel 3/8 inch, no single piece of floor and cover plates shall weigh more than 80 pounds.
- B. Surface shall be raised-lug pattern
- C. Slip-Resistant Surface:
 - 1. Acceptable Manufacturers:
 - a. IKG Industries; Melbac.
 - b. W.S. Molnar Co.; Slip-Not Grade 2-Medium.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Verify measurements at the Project Site.
- B. Verify that field conditions are acceptable and are ready to receive work.
- C. Make provisions for erection loads with temporary bracing. Keep work in alignment.
- D. Provide items required to be cast into concrete with setting templates.

3.02 FABRICATION

- A. Other fabrications: conform to **AWS D1.1, AWS D1.6** minimum.
- B. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt-tight, flush, and hairline. Remove burrs and weld splatter. Ease exposed edges to small uniform radius.
- C. Punch holes 1/16-inch larger than the nominal size of the bolts, unless otherwise indicated. Whenever needed because of the thickness of the metal, subpunch and ream or drill holes.
- D. Perform fabrication including cutting, drilling, punching, threading and tapping required for miscellaneous metal or adjacent work prior to hot-dip galvanizing.

3.03 FINISH

- A. Welds and adjacent are to be prepared such that there are:
 - 1. No undercutting or reverse ridges on the weld beads.
 - 2. No weld spatter on or adjacent to the weld or any other area to be painted.
 - 3. No sharp peaks or ridges along the weld bead.
- B. Embedded pieces of electrode or wire and the adjacent weld: removed and replaced with new welds.
- C. Obtain Project Representative's review before applying finish.

3.04 INSTALLATION

- A. Install items plumb, level and square, accurately fitted, and free from distortion or defects.
- B. Allow for erection loads and provide temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

- C. Fieldwork shall not be permitted on galvanized items. Drilling of bolts or enlargement of holes to correct misalignment is not allowed.
- D. Protect encased or embedded dissimilar metals (both metals shall be encased or embedded) from galvanic corrosion by means of pressure tapes, coatings or isolators. Aluminum in contact with concrete or grout shall be protected with a heavy coat of bituminous paint.
- E. Place metalwork to be embedded in concrete accurately and hold in correct position while the concrete is placed or, if indicated, form recesses or blockouts in the concrete. Thoroughly clean the surfaces of metalwork in contact with or embedded in concrete. If accepted, recesses may be neatly cored in the concrete after it has attained its design strength and the metalwork grouted in place.
- F. Pipe Sleeves:
 - 1. Provide a pipe sleeve wherever a pipe or similar item passes through concrete.
 - 2. If not otherwise indicated on the Drawings provide a caulking sealant or a mechanical seal to form a watertight seal of the annular space between pipes and pipe sleeves.
- G. Cover Plates:
 - 1. Field measured for proper cutouts and proper sizes.
 - 2. Accurately position prior to placing concrete, such that all cover plates are flush with floor surfaces.

3.05 FIELD REPAIR OF COATINGS

- A. Painted: after installation, clean and touch up damaged areas of with the same materials used for the shop coat.

3.06 ELECTROLYTIC CORROSION PROTECTION

- A. Coat surfaces of aluminum that are to be in contact with concrete, or grout with a heavy coat of bituminous paint. Dissimilar metals shall be protected from galvanized corrosion by means of pressure tapes, coating, or isolators.

END OF SECTION

SECTION 07 19 00 CLEAR WATER REPELLENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Division 01 Specification Sections, Drawings, General Conditions, Supplementary General Conditions, and Special Conditions apply to this section.

1.02 SUMMARY

- A. Section Includes: Provide clear water repellent treatment for exposed exterior surfaces of special color and texture concrete masonry construction.
- B. Related Sections:
1. **Section 04 22 00 - Concrete Unit Masonry:** Mock-ups and testing requirements for systems with clear water repellent treatment.
 2. **Section 07 90 00 - Joint Protection.**

1.03 REFERENCES

REFERENCE	TITLE
ASTM C 140	Methods for Sampling and Testing Concrete Masonry Units.
ASTM E 96	Test Methods for Water Vapor Transmission of Materials
ASTM E 514	Standard Test Method for Water Penetration and Leakage Through Masonry
ASTM G 53	Standard Practice for Operating Light- and Water-Exposure Apparatus for Exposure of Nonmetallic Materials

1.04 SYSTEM DESCRIPTION

- A. Performance Requirements:
1. Absorption: Provide treatment materials which have been tested on concrete masonry to indicate degree of change of absorption of concrete masonry units based on **ASTM C 140**.
 - a. Effectiveness: Minimum 85% over control units.
 2. Water Vapor Transmission: Provide treatment materials which have been tested on concrete masonry to indicate degree of change of water vapor transmission through concrete masonry units based on **ASTM E 96**.
 - a. Change: No significant change in water vapor transmission.
 3. Water Permeance: 98% min. reduction of water penetration through the masonry wall in accordance with **ASTM E 514**.
 4. Weathering and UV Stability: Provide treatment materials tested on concrete masonry in accordance with **ASTM G 53**.
 - a. Change: No significant change in unit gloss, color, or absorption.

1.05 SUBMITTALS

- A. Product Data: Submit manufacturer's literature for clear water repellent treatment.
- B. Samples: Submit samples of concrete masonry units approved for use in Project with water repellent treatment applied to half of each sample face; indicate which half has been coated.
- C. Quality Assurance Submittals:
 - 1. Test Reports. Submit test reports indicating compliance with performance requirements for absorption, water vapor transmission, and weathering and UV stability.
 - 2. Certificates.
 - a. Submit installer qualification certificates.
 - b. Submit manufacturer's installer approval certificate.
 - c. Submit certification indicating materials comply with applicable VOC limitations.
 - 3. Manufacturer's Instructions: Provide copies of manufacturer's installation instructions to field office.
 - 4. Manufacturer's Field Reports: Submit report of manufacturer's representatives indicating materials have been installed in accordance with manufacturer's instructions and recommendations.
 - 5. Qualification of Manufacturer: Firm with minimum five years record of successful in-service experience of clear water repellent treatments manufactured for concrete masonry unit application.

1.06 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Qualification of Manufacturer: Firm with minimum five years record of successful in-service experience of clear water repellent treatments manufactured for concrete masonry unit application.
 - 2. Qualification of Installers: Applicator with minimum five years successful experience in projects of similar scope using specified or similar treatment materials and approved by treatment manufacturer.
- B. Regulatory Requirements: Provide materials with not more than the maximum volatile organic compounds (<15 g/L) as required by applicable authorities.
- C. Mock-Up: Prior to commencing work, including bulk purchase and delivery of material, apply clear water repellent treatment to concrete masonry mock-up indicated in Contract Documents.
 - 1. Testing: Provide field testing of concrete masonry system mock-up, including clear water repellent treatment; test to be observed by Project Representative and water repellent treatment manufacturer's representative per **ASTM E 514**.

- a. Application: Apply clear water repellent treatment to left side of mock-up and allow to cure prior to application of treatment to right side of mock-up.
 - b. Test: Twenty days after completion of application of treatment, test mock-up with 5/8 inch garden hose with spray nozzle located ten feet from wall and aimed upward so water strikes wall at 45 degree downward angle.
 - 1) Run water continuously for two hours.
 - 2) Observe back side of mock-up for water penetration and leakage; where leakage is detected make changes as needed to correct and retest.
 - c. Results: Cooperate with testing procedures and modify Project treatment application as required to pass mock-up tests for water penetration and leakage resistance.
2. Approval: Proceed with clear water repellent treatment work only after completion of field test application and approval of mock-up.
- D. Pre-Installation Meeting:
1. Attend pre-installation meeting required prior to commencement of concrete masonry installation.
 2. Review procedures and coordination required between concrete masonry and clear water repellent treatment work and between treatment work and work which could be affected by or affect treatment.
 3. Convene additional pre-installation meeting prior to water repellent treatment application for coordination with work not previously coordinated including joint sealers as needed.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver water repellent treatment products to job site in manufacturer's container with label intact and listing product identification, batch number and date of manufacture.
- B. Storage: Keep materials in original, unopened containers; prevent contamination by foreign materials.

1.08 SITE CONDITIONS

- A. Environmental Requirements: Comply with manufacturer's recommendations; do not apply clear water repellent treatments under following conditions.
1. During inclement weather, when air temperature is below 50 degrees Fahrenheit or above 100 degrees Fahrenheit.
 2. When rain or temperatures below 40 degrees Fahrenheit are predicted for a period of 24 hours before or after treatment application.
 3. Earlier than 3 days after surfaces became wet.
 4. When substrates might be frozen.
 5. When surface temperature is less than 40 degrees Fahrenheit.

1.09 WARRANTY

- A. Special Warranty: Provide for correcting failure of water repellent treatment to resist penetration of water.
 - 1. Warranty Period: Minimum of five years.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Clear Water Repellent Treatment:
 - 1. Appearance: Clear, non-yellowing water repellent treatment shall not alter appearance, color, or texture of substrate under any lighting conditions.
- B. Compatibility: Provide products which are recommended by manufacturer to be fully compatible with indicated substrates and joint sealers which are in contact with water repellent treatment.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Examine substrates; do not apply treatment to damp, dirty, dusty, or otherwise unsuitable surfaces; comply with manufacturer recommendations.
 - 1. Do not begin application of clear water repellent treatment until voids and beeholes visible from 5 feet, and cracks greater than 0.02" wide in masonry substrate have been repaired.

3.02 PREPARATION

- A. Protection: Provide masking or covering for materials which could be damaged by application of clear water repellent treatment.
 - 1. Sealant Coordination: Assure treatment compatibility with each type of joint sealer within or adjacent to surfaces receiving clear water repellent treatment.
 - a. Coordinate treatment application with joint sealers; where recommended by joint sealer manufacturer, apply treatment after application and cure of joint sealers.
 - b. Mask surfaces indicated to receive joint sealers which would be adversely affected by clear water repellent treatment where treatment must be applied prior to application of joint sealers.
 - 2. Protect surrounding cement concrete pavement area, illumination components and prefinished products from contact with water repellent treatment.
 - 3. Protect landscape materials with breathing type drop cloths; plastic covers are not acceptable.

- B. Surface Preparation: Prepare substrates in accordance with water repellent treatment manufacturer's recommendations.
 - 1. Clean surfaces of dust, dirt, and foreign matter detrimental to proper installation of water repellent treatment.

3.03 APPLICATION

- A. General: Apply treatment in accordance with clear water repellent treatment manufacturer's instructions and applicable recommendations, including number of coats, maximum allowable coverage, and equipment.
 - 1. Review procedures used for application of treatment to mock-up and recommendations for changes needed based on water penetration tests conducted on mock-up.
 - 2. Consult with manufacturer's representative for site inspections, for proper application techniques not fully covered in manufacturer instructions, and for applicable recommendations.

3.04 REPAIR

- A. Repair or replace materials damaged by application of water repellent treatment.

3.05 FIELD QUALITY CONTROL

- A. Site Inspections: Manufacturer's representative shall inspect application of water repellent treatment in progress to verify compliance with manufacturer instructions and recommendations.

3.06 CLEANING

- A. Clean water repellent treatment from surfaces not indicated to be treated immediately; comply with recommendations of materials manufacturers for proper cleaning techniques to prevent damage.

END OF SECTION

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SECTION 07 90 00 JOINT PROTECTION

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Sealants.
 - 2. Accessories
- B. RELATED REQUIREMENTS
 - 1. **Section 03 30 31 – Cast-in-Place Concrete**
 - 2. **Section 04 22 00 – Concrete Unit Masonry**
 - 3. **Section 07 19 00 – Clear Water Repellent Treatment**

1.02 REFERENCES

REFERENCE	TITLE
ASTM C834	Standard Specification for Latex Sealants; 2010.
ASTM C920	Standard Specification for Elastomeric Joint Sealants; 2011
ASTM C1193	Standard Guide for Use of Joint Sealants; 2011a
ASTM C1330	Standard Specification for Cylindrical Sealant
TYPE C	
ASTM D1056	Standard Specification for Flexible Cellular Materials-- Sponge or Expanded Rubber; 2007
ASTM D1667	Standard Specification for Flexible Cellular Materials-- Polyvinyl Chloride Foam (Closed-Cell); 2005 (Reapproved 2011)

1.03 SUBMITTALS

- A. Specified in **Section 01 33 00 - Submittal Procedures**
- B. Approval Submittals:
 - 1. Product Data:
 - a. Submit Manufacturer's product data for products specified in this Section including product characteristics, performance, certified test results, product limitations and other information necessary to establish conformance with the requirements of this Section.
 - 2. Manufacturer's Instructions.
 - 3. Samples: Submit samples of the following accessories:
 - a. Bond Breakers.
 - b. Cylindrical Sealant Backing.
 - c. Neoprene Sponge.

- C. Quality Assurance Submittals:
 - 1. Statement of Installer Qualifications.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Installer shall have at least five years of experience in the application of sealants similar to those specified in this Section on projects comparable in scope to the Project.
- B. Source Limitation:
 - 1. Each product or system specified in this Section shall be from a single Manufacturer.
 - 2. Accessories, materials and components associated with each product specified in this Section shall be provided by the Manufacturer of that product unless:
 - a. Noted otherwise in this Section, or:
 - b. Approved in writing by the Manufacturer of the product.

1.05 PROJECT CONDITIONS

- A. Maintain temperature and humidity recommended by the sealant Manufacturer during and after installation.

PART 2 PRODUCTS

2.01. MANUFACTURERS

- A. Subject to compliance with requirements of the Contract Documents, products of the following Manufacturers shall be incorporated in the Work of this Section:
 - 1. Tremco - www.tremcosealants.com
 - 2. Dow Corning (Dow) - www.dowcorning.com.
 - 3. Sika Corporation (Sika) - www.sikaconstruction.com.
 - 4. BASF (formerly Sonneborn) - www.buildingsystems.basf.com.
 - 5. Hohmann @ Barnard, Inc. – www.h-b.com.

2.02 TWO-COMPONENT POLYURETHANE

- A. Locations:
 - 1. Concrete - vertical joints.
- B. Characteristics:
 - 1. Elastomeric, two-component, non-sag polyurethane.
 - 2. Complies with **ASTM C-920 Type M**, Grade NS, Class 25, Use T, NT, M, G, A, O and I and Federal specification TT-S-00230 C Type II, Class A.
- C. Acceptable Products:
 - 1. Sika – 'Sikaflex-2c NS'
 - 2. BASF – MasterSeal NP2

2.03 ONE-COMPONENT POLYURETHANE

- A. Locations:
 - 1. Aluminum door and gate framing
 - 2. Aluminum decorative metal panels
- B. Characteristics:
 - 1. Elastomeric, single-component, non-sag polyurethane.
 - 2. Complies with **ASTM C-920 Type S**, Grade NS, Class 35, Uses T, NT, O, M, G and I.
- C. Acceptable Products:
 - 1. Sika - 'Sikaflex-1a'
 - 2. BASF – MasterSeal NP1

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with Manufacturer's instructions.
- C. Perform preparation in accordance with Manufacturer's instructions and **ASTM C1193**.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

- A. Perform work in accordance with sealant Manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with **ASTM C1193**.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by Manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker where joint backing is not used.

- E. Install neoprene sponge up against vertical joints where concrete unit masonry and existing building façade meets.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Apply sealant within recommended application temperature ranges. Consult Manufacturer when sealant cannot be applied within these temperature ranges.
- H. Tool joints concave.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION

- A. Protect sealants until cured.

END OF SECTION

SECTION 08 70 00 ENTRY HARDWARE

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Entry hardware for aluminum access doors and gates of enclosures located at Site A and Site B.
- B. Related Requirements:
 - 1. **Section 32 31 24 – Aluminum Doors and Gates**
 - 2. **Section 28 13 00 – Access Control & Video Management System**

1.02 REFERENCES

REFERENCE	TITLE
36 CFR 1191	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
ADA Standards	Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
ICC A117.1	Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).
BHMA	Builders' Hardware Manufacturers Association
DHI	Door and Hardware Institute
NFPA	National Fire Protection Association
UL	Underwriters Laboratories.
UL 10C	Fire Tests of Door Assemblies
UL 305	Panic Hardware
WHI	Warnock Hersey Incorporated

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door/gate hardware will be installed upon.
- B. Furnish templates for door/gate and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- C. Convey Owner's keying requirements to manufacturers.

1.04 SUBMITTALS

- A. Product Data: Catalog literature including manufacturers' technical product information for each item of door/gate hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- B. Schedule: Organized vertically into "Hardware Sets" with index of doors/gates and headings, indicating complete designations of every item required for each door/gate or opening. Include following information:
1. Include a Cover Sheet with;
 - a. Job Name, location, telephone number.
 - b. Architects name, location and telephone number.
 - c. Contractors name, location, telephone number and job number.
 - d. Suppliers name, location, telephone number and job number.
 - e. Hardware consultant's name, location and telephone number.
 - f. A list of similar projects with photo examples of hardware installer's documented experience within 5 years.
 2. Job Index information included;
 - a. Numerical door number index including; door/gate number, hardware heading number and page number.
 - b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
 - c. Manufacturers' names and abbreviations for all materials.
 - d. Explanation of abbreviations, symbols, and codes used in the schedule.
 - e. Mounting locations for hardware.
 - f. Clarification statements or questions.
 - g. Catalog literature and manufacturer's technical data and instructions.
 3. Vertical schedule format sample:
 - a. Heading Number 1 (Hardware group or set number – HW -1)

Heading Number 1 (Hardware group or set number – HW -1)					
			(a) 1 Single Door #1 - Exterior from Corridor 101	(b)90°	(c) RH
			(d) 3' 0"x7' 0" x 1-3/4" x (e) 20 Minute (f) WD x HM		
(g) 1	(h)	(i) ea	(j) Hinges - (k) 5BB1HW 4.5 x 4.5 NRP (l) ½ TMS	(m) 626	(n) IVE
2	6AA	1 ea	Lockset - ND50PD x RHO x RH x 10-025 x JTMS	626	SCH

- C. (a) - Single or pair with opening number and location. (b) - Degree of opening (c) - Hand of door(s)/gate(s) (d) – Door/gate and frame dimensions and thickness. (e) - Label requirements if any. (f) - Door by frame material. (g) - (Optional) Hardware item line #. (h) - Keyset Symbol. (i) - Quantity. (j) - Product description. (k) - Product Number. (l) - Fastenings and other pertinent information. (m) - Hardware finish codes per ANSI A156.18. (n) - Manufacture abbreviation
- D. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.
- E. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- F. Templates for doors/gates, frames, and other work specified to be factory prepared for the installation of door/gate hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.05 QUALITY ASSURANCE

- A. Obtain each type of hardware (latch and lock sets, drop rod, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door/gate hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door/gate hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Project Representative, and Contractor, at reasonable times during the course of the Work, for consultation.
- C. Responsible for detailing, scheduling and ordering of finish hardware.
- D. Meet with Owner to finalize keying requirements and to obtain final instructions in writing. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.
- E. Hardware Installer: Company specializing in the installation of commercial door/gate hardware with five years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.

- B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.
- C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.
- D. Inventory door/gate hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

1.07 WARRANTY

- A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:
 - 1. Locksets: Seven (7) years.
 - 2. Electronic Lock for Access Control: Two (2) years.
 - 3. Door Hinge Closers: Three (3) years.
 - 4. All other hardware: Two (2) years.

1.08 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.09 PRE-INSTALLATION CONFERENCE

- A. Convene a pre-installation conference at least one week prior to beginning work of this section.
- B. Attendance: Project Representative, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key District Personnel, and Project Inspector.
- C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review District's keying standards.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gate Hinges:
 - 1. Locinox – <https://www.locinoxusa.com>
 - 2. Palmshield - <https://palmshieldlouvers.com>
- B. Door Hinge Closers:
 - 1. Locinox – <https://www.locinoxusa.com>
 - 2. Waterson USA – <https://watersonusa.com>

- C. Locks, Latches, and Cylinders:
 - 1. Locinox – <https://www.locinoxusa.com>
 - 2. Best – www.bestaccess.com
 - 3. Schlage – www.schlage.com
- D. Flush Bolts:
 - 1. DCI – www.doorcontrols.com
 - 2. Ives – www.iveshinges.com
 - 3. Trimco – www.trimcobbw.com
- E. Dust Proof Strikes:
 - 1. DCI – www.doorcontrols.com
 - 2. Ives – www.iveshinges.com
 - 3. Trimco – www.trimcobbw.com
- F. Stops:
 - 1. DCI – www.doorcontrols.com
 - 2. Ives – www.iveshinges.com
 - 3. Trimco – www.trimcobbw.com
- G. Security Guard Plate:
 - 1. DAC Industries – <https://dacindustries.com/>

2.02 MATERIALS

- A. Gate Hinges: Exterior out-swinging gate butts shall be non-ferrous material and shall have stainless steel hinge pins. All gates to have non-rising pins.
 - 1. Hinges shall be sized in accordance with the following:
 - a. Height:
 - 1) Doors up to 41" wide: 4-1/2" inches.
 - 2) Doors 42" to 48" wide: 5 inches.
 - b. Width: Sufficient to clear frame and trim when gate swings 180 degrees.
 - c. Number of Hinges: Furnish 3 hinges per leaf to 7'-5" in height. Add one for each additional 2 feet in height.
 - 2. Furnish non-removable pins (NRP) at all exterior out-swing gates and interior key lock doors with reverse bevels.
- B. Mortise Locks: Locinox FortyLock
 - 1. Locksets to comply with ANSI A156.13, Series 1000, Operational Grade 1 and Security Grade 1 with all standard trims. Locksets shall also comply with UL10C Positive Pressure requirements
 - 2. Lock case shall be manufactured with heavy 12 gauge steel with fully wrapped design. Lock cases with exposed edges are not acceptable. Lock case shall be multi-functional allowing transformation to a different function without opening lock case.

3. Latchbolt shall have $\frac{3}{4}$ " throw and be non-handed, field reversible without opening the lock case. Solid latchbolts and / or plastic anti-friction devices are not acceptable.
4. The deadbolt, when used, shall be 1" throw stainless steel with a $\frac{3}{4}$ " internal engagement when fully extended.
5. All trim shall be through-bolted with the spring cages supporting the trim attached to the lock cases to prevent torquing.
6. Levers to have independent rotation in both directions. Exterior lever assembly to be one-piece design attached by threaded bushing. Interior lever assembly shall be attached by screwless shank - Pair of Stainless Steel Handles for Hybrid Locks - Part # 3006I-H
7. Thru-bolt lever assemblies through the door for positive interlock. Locks using a through the door spindle for attachment are not acceptable. Spindles shall be independent, designed to "break-away" at a maximum of 75psi torque.
8. Hand of lock chassis to be changeable by simply moving one screw from one side to the case to the other and pulling and reversing the latchbolt.
9. Cylinders to be secured by a cast stainless steel, dual retainer. Locks utilizing screws and / or stamped retainers are not acceptable.

C. Key Card Reader: **Section 28 13 00 – Access Control & Video Management System**

- D. Gate/Door Hinge Closers: Locinox as scheduled. Place closers inside enclosures.
1. Door closer cylinders shall be outdoor rated and vandal proof.
 2. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
 3. All door closers shall be fully hydraulic with constant closing speed unaffected by temperature changes.
 4. Closers shall be installed to permit doors to swing 90 degrees.
 5. All closers shall utilize a stable fluid withstanding temperature range of 120 degrees F. to -30 degrees F. without requiring seasonal adjustment of closer speed to properly close the door.
 6. Provide the manufactures drop plates, brackets and spacers as required at narrow head rails and special frame conditions. NO wood plates or spacers will be allowed.
 7. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position. Door shall take at least 3 seconds to move from an open position of 70 degrees to a point of 3 inches from the latch jamb.

8. Provide sex-bolted or through bolt mounting for all door closers.
- E. Flush Bolts & Dust Proof Strikes: Automatic Flush Bolts shall be of the low operating force design. Utilize the bottom bolt only model for exterior doors where applicable and as permitted by testing procedures.
 1. Manual flush bolts only permitted on storage or mechanical openings as scheduled.
 2. Provide dust proof strikes at openings using bottom bolts.
- F. Door Stops:
 1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where floor type cannot be used, provide wall type. If neither can be used, provide overhead type.
 2. Do not install floor stops more than four (4) inches from the face of the wall or partition (CBC Section 1133B.8.6).
- G. Door and gate security guard plate: provide plate to be fastened securely to back of gate and door around latch handle hardware.

2.03 KEYING

- A. Furnish a Proprietary Best masterkey system as directed by the owner.
- B. Furnish all cylinders in the Small Format Interchangeable Core (SFIC) keyway to match the Best keyway.
- C. Furnish mechanical keys as follows:
 1. Furnish 2 cut change keys for each different change key code.
 2. Furnish 1 uncut key blank for each change key code.
 3. Furnish 5 cut masterkeys for each different masterkey set.
 4. Furnish 3 uncut key blanks for each masterkey set.
 5. Furnish 2 cut control keys cut to the top masterkey for permanent I/C cylinders.
 6. Furnish 1 cut control key cut to each SKD combination.

2.04 FINISHES

- A. Generally to be bronze color.
- B. Furnish door/gate security guard plate in powder coat finish in bronze color.
- C. Gate and door closers shall be bronze color.
- D. Aluminum items to be finished bronze color.
- E. Lock and latches shall be stainless steel.
- F. Anti-Graffiti Coating according to **SECTION 09 90 00 Painting and Coating**

2.05 FASTENERS

- A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal.
- B. Screws for butt hinges shall be flathead, countersunk, full-thread type.
- C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.
- D. Provide expansion anchors for attaching hardware items to concrete or masonry.
- E. All exposed fasteners shall have a tamper resistant head.
- F. All unexposed fasteners shall have a phillips head.
- G. Finish of exposed screws to match surface finish of hardware or other adjacent work.
- H. Lock Protectors shall be fastened to the door and gate by the means of sex bolts or through bolts.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors, gates, and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.
- B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.
- B. Use the templates provided by hardware item manufacturer.
- C. Mounting heights for hardware shall be as recommended by the Door and Hardware Institute. Operating hardware will to be located between 30" and 44" AFF.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

- F. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.
- G. Hardware Installer shall coordinate with security contractor to route cable to connect electrified locks to power transfers or electric hinges at the time these items are installed to avoid disassembly and reinstallation of hardware.
- H. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to insure proper and secure operation.
- I. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.
- J. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function. Transformer shall be low voltage (120V).
- K. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer's technical documentation.

3.03 ADJUSTING AND CLEANING

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surface soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

- E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.04 HARDWARE LOCATIONS

- A. Conform to ADAAG and the drawings for access-compliant positioning requirements for the disabled.

3.05 FIELD QUALITY CONTROL

- A. Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturer's instructions and as specified herein.

3.06 SCHEDULE

- A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.
- B. The Door Schedule on the Drawings indicates which hardware set is used with each door/gate.

Manufacturers Abbreviations (Mfr.)

PAM	=	Palmshield	Gate Hinges
LOC	=	Locinox	Door Hinge Closers, Locks, Latch Bolt
BES	=	Best	Cylinders
IVE	=	Ives	Bolts, Dust Proof, Push, Pull, & Door Stops
DAV	=	DAC Industries	Security Guard Plate

HW 01 – Site A Enclosure Double Swing Access Gate

Qty	Description	Catalog Number	Finish	Mfr
3 EA	HINGE	Gorilla Hinges	BLK	PAM
1 EA	EL MORTISE LOCK	FORTYLOCK-SS-20	SS	LOC
1 EA	MORTISE CYLINDER	1E64	626	BES
1 EA	PERMANENT CORE	DEALER SUPPLIED	630	SCH
2 EA	SURFACE CLOSER	VERTICLOSE-2	BLK	LOC

2	EA	LATCH BOLT	VSA-K-QF1BL	BLK	LOC
1	EA	GUARD PLATE	D-6016-P	BLK	DAC

Operational Description

Latch bolt retracted by key outside or by lever inside. Outside knob/lever always operative. Auxiliary latch deadlocks latch bolt when door is locked. Inside lever is always free for immediate egress. Self-Closing. Templating allows CUSH Arm to stop the door's swing between 85 and 110 degrees. Back check engages at approximately 45 degrees of the opening swing.

HW 02 – Site A Enclosure Public Access Door

Qty		Description	Catalog Number	Finish	Mfr
1	EA	EL MORTISE LOCK	L9092BDEL 17A RX	630	SCH
1	EA	MORTISE CYLINDER	1E64	626	BES
1	EA	PERMANENT CORE	DEALER SUPPLIED	630	SCH
3	EA	HINGE CLOSER	MAMMOTH180	BLK	LOC
1	EA	ACCESS CONTROL	KEY CARD READER	BLK	
1	EA	GUARD PLATE	D-6016-P	BLK	DAC

Operational Description

Auxiliary latch deadlocks latch bolt when door is locked. Inside lever is always free for immediate egress. Self-Closing.

HW 03 – Site A Enclosure Maintenance Access Door

Qty		Description	Catalog Number	Finish	Mfr
1	EA	EL MORTISE LOCK	L9092BDEL 17A RX	630	SCH
1	EA	MORTISE CYLINDER	1E64	626	BES
1	EA	PERMANENT CORE	DEALER SUPPLIED	630	SCH
3	EA	HINGE CLOSER	MAMMOTH180	BLK	LOC
1	EA	EL MORTISE LOCK	L9092BDEL 17A RX	630	SCH
1	EA	ACCESS CONTROL	KEY CARD READER	BLK	
1	EA	GUARD PLATE	D-6016-P	BLK	DAC

Operational Description

Knob/lever retracts latchbolt from either side. Inside lever is always free for immediate egress. Self-Closing.

HW 04 – Site B Enclosure Double Swing Access Gate

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	Gorilla Hinges	BLK	PAM
1	EA	EL MORTISE LOCK	FORTYLOCK-SS-20	SS	LOC
1	EA	MORTISE CYLINDER	1E64	626	BES
1	EA	PERMANENT CORE	DEALER SUPPLIED	630	SCH
2	EA	SURFACE CLOSER	VERTICLOSE-2	BLK	LOC
2	EA	LATCH BOLT	VSA-K-QF1BL	BLK	LOC
1	EA	GUARD PLATE	D-6016-P	BLK	DAC

Operational Description

Latch bolt retracted by key outside or by lever inside. Outside knob/lever always operative. Auxiliary latch deadlocks latch bolt when door is locked. Inside lever is always free for immediate egress. Self-Closing. Templating allows CUSH Arm to stop the door's swing between 85 and 110 degrees. Back check engages at approximately 45 degrees of the opening swing.

HW 05 – Site A Enclosure Public Access Door

Qty		Description	Catalog Number	Finish	Mfr
1	EA	EL MORTISE LOCK	L9092BDEL 17A RX	630	SCH
1	EA	MORTISE CYLINDER	1E64	626	BES
1	EA	PERMANENT CORE	DEALER SUPPLIED	630	SCH
3	EA	HINGE CLOSER	MAMMOTH180	BLK	LOC
1	EA	ACCESS CONTROL	KEY CARD READER	BLK	
1	EA	GUARD PLATE	D-6016-P	BLK	DAC

Operational Description

Auxiliary latch deadlocks latch bolt when door is locked. Inside lever is always free for immediate egress. Self-Closing.

END OF SECTION

SECTION 09 24 23 CEMENT STUCCO

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Supply and installation of a rapid hardening, hydraulic cement, exterior one-coat cement stucco
- B. RELATED REQUIREMENTS
 - 1. **Section 04 22 00 - Concrete Unit Masonry**
 - 2. **Section 07 90 00 - Joint Protection**
 - 3. **Section 09 90 00 - Painting and Coating**

1.02 REFERENCES

- A. ASTM C144 Standard Specification for Aggregate for Masonry Mortar
- B. ASTM C897 Standard Specification for Aggregate for Job-Mixed Portland Cement Based Plaster
- C. ASTM C920 Standard Specification for Elastomeric Joint Sealants
- D. ASTM C926 Standard Specification for Application of Portland Cement-Based Plaster
- E. ASTM C1600 Standard Specification for Rapid Hardening Hydraulic Cement
- F. IBC International Building Code
- G. IRC International Residential Code
- H. ICC-ES Acceptance Criteria for Water-Resistive Barriers AC38
- I. ICC-ES Rapid Set One Coat Stucco System ESR-2671
- J. TSIB Technical S

1.03 ASSEMBLY DESCRIPTION

- A. One-Coat Stucco assembly consisting of a code compliant water-resistive barrier, pre-blended rapid hardening, high early strength stucco basecoat, and finish. The stucco assembly is installed on exterior walls over concrete masonry construction.

1.04 SUBMITTALS

- A. General: Submit samples, Evaluation Reports and manufacturer's product data sheets in accordance with **Division 01 33 00 - General Requirements Submittal Section**.
- B. Samples:
1. Submit samples with product information for approval. Samples must be of materials specified, along with applicable anti-graffiti coating, and of suitable size as required to accurately represent each color and texture used on project. Prepare each sample using the same tools and techniques for actual project application.
 2. Maintain and make approved samples available at the job site throughout the construction process and until final acceptance.
Provide (2) 2 foot wide by 2 foot tall mock-up of the complete system sample panels including paint color on pilaster and wall CMU units according to **Section 09 90 00 – Painting and Coating**. Mock-up with anti-graffiti coating according to **Section 09 90 00 – Painting and Coating** must be reviewed and approved by Project Representative for uniformity of depth and thickness, finish color and texture, and overall quality of construction.
 - a. The approved panel will become the standard of comparison for finished work for the project. The approved panel must remain on site throughout the construction process and until final acceptance.
 3. Upon project completion and final acceptance, dispose of the sample in accordance with local construction waste guidelines.
- C. Qualifications:
1. Installer's examples of relevant projects with same general scope and complexity assemblies in the United States for at least five (5) years.
 2. Manufacturer information of system components manufactured by or approved for use by CTS Cement Manufacturing Corp. (800-929-3030, www.CTScement.com) and distributed by the same or an authorized CTS dealer.

1.05 QUALITY ASSURANCE

- A. Qualifications:
1. Manufacturer:
 - a. Must have marketed stucco assemblies in the United States for at least five (5) years and have completed projects of the same general scope and complexity.
 - b. System components must be manufactured by or approved for use by CTS Cement Manufacturing Corp. (800-929-3030, www.CTScement.com) and distributed by the same or an authorized CTS dealer.
 2. Applicator:
 - a. Must be experienced and competent in installation of rapid hardening stucco and plaster-like materials and provide evidence of a minimum of five (5) years experience in work similar in size and scope to that required by this section.

- b. Must provide proof of current Approved Applicator status from the stucco materials manufacturer. Temporary approvals must be approved in writing by an authorized CTS Cement Manufacturing Technical Representative at least 15 days prior to installation and are required to have an authorized CTS Representative on site for initial application.
- B. Functional Criteria:
 - 1. General:
 - a. Stucco application must be to code compliant vertical substrates or to substrates sloped for positive drainage.
 - b. Uses and installation must comply with **ICC ESR-2671** and all applicable building codes.
- C. Substrate Conditions:
 - 1. Substrate materials and construction must conform to the building code having jurisdiction.
 - 2. Substrates must be sound, dry and free of dust, dirt, laitance, efflorescence and other harmful contaminants.
 - 3. Substrate Dimensional Tolerances: Flat with 1/4 in (6.4 mm) within any 10 ft (3 m) radius.
 - 4. Maximum deflection of substrate system under positive or negative design loads must not exceed L/360 of span.
- D. Expansion and Control Joints: Continuous expansion and control joints must be installed at locations in accordance with **ASTM C1063** and **ASTM C926**.
 - 1. Substrate movement, and expansion and contraction of the stucco assembly and adjacent materials must be taken into account in design of expansion joints, with proper consideration given to sealant properties, installation conditions, temperature range, coefficients of expansion of materials, joint width to depth ratios, and other material factors. Minimum width of expansion joints must be as specified by the designer or shown on the project drawings.
 - 2. In accordance with **ASTM C1063**, expansion or control joints must be installed in walls not more than 144 ft² (13.4 m²) in area, and not more than 100 ft² (9.3 m²) in area for all non-vertical applications. The distance between joints must not exceed 18 ft (5.5 m) in either direction or a length-to-width ratio of 2-1/2 to 1.
 - 3. For direct application to concrete or masonry, stucco joints are required only at control/expansion joints in the underlying concrete or masonry.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver products in original, unopened, undamaged packaging with manufacturer's identification (i.e., brand logo, product name, weight of packaged unit, lot number).

- B. Storage: Store products in a dry location, covered, out of direct sunlight, off the ground, and protected from moisture. Maintain storage temperature required by the manufacturer. Keep materials dry until used. Store bulk sand in a well-drained area on a clean, solid surface. Cover sand to prevent contamination.
- C. Handling: Handle products in accordance with manufacturer's published recommendations.

1.07 PROJECT/SITE CONDITIONS

- A. Temperature: Maintain ambient and surface temperatures between 32°F (0°C) to 110°F (78°C). Do not apply stucco materials if ambient temperature falls below 32°F (0°C) within 24 hours of application. Protect stucco from uneven and excessive evaporation during dry weather, windy conditions and strong blasts of dry air.
- B. Inclement Weather: Do not apply stucco base during inclement weather unless appropriate protection is employed.
- C. Sunlight Exposure: Avoid, whenever possible, installation of stucco materials in direct sunlight which could adversely affect aesthetics.
- D. Substrate: Prior to installation, the wall surfaces must be inspected for surface contamination or other conditions that may adversely affect the performance of the stucco materials and be free of residual moisture.
- E. Protect adjacent and surrounding surfaces not specified to receive finishing with drop cloths, waterproof paper, or other means to ensure protection against overspray, water or other harmful debris.

1.08 COORDINATION AND SCHEDULING

- A. Coordinate installation of stucco materials with all other trades to avoid damage of installed stucco materials and to avoid impeding other construction.
- B. Sufficient manpower must be provided to ensure continuous application and timely finishing, and to prevent cold joints, scaffolding lines, variations in texture, etc.

1.09 WARRANTY

- A. Warranty: Upon request, at completion of installation, provide manufacturer's Standard Limited Warranty for stucco one-coat materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: CTS Cement Manufacturing Corp., 12442 Knott Street, Garden Grove, CA 92841 (800-929-3030, www.CTScement.com)
- B. Components: Obtain stucco materials components manufactured by CTS Cement from authorized distributors. No substitutions or additions of other materials are permitted without prior written permission from the manufacturer for this project prior to awarded bid.

2.02 MATERIALS

- A. Stucco Basecoat -
 - 1. Rapid Set® Stucco Mix: a rapid-setting, high early strength, low shrinkage plastic cement, pre-blended with quality plaster sand and high-performance additives, mixed with clean, cool, potable water in the field.
 - 2. Cement Performance Criteria:
 - Compressive Strength,**
 - Minimum (ASTM C109)**
 - 1,500 psi 6 hours
 - 2,500 psi 24 hours
 - 3,500 psi 28 days
- B. Water: Clean, potable water free of deleterious amounts of silt and dissolved salts.

2.03 RELATED MATERIALS AND ACCESSORIES

- A. General: Stucco assembly and its related materials must conform to the requirements of **ICCES Evaluation Report No. 2671** and this specification.
- B. Substrate Materials:
 - 1. Concrete Masonry Construction: Non-painted (uncoated), must conform to current IBC and IRC building codes.
- C. Seals, Sealants and Bond Breakers: Sealants must conform to **ASTM C920**, Grade NS, Class 25, Use NT. Backer rod must be closed-cell polyethylene foam.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify project site conditions under provisions of **Division 1 – General Requirements**.
- B. Compliance: Comply with manufacturer's instructions for installation of the stucco materials.

- C. Substrate Examination: Examine prior to stucco base installation as follows:
 - 1. Substrate must be of a type approved by stucco manufacturer. Plywood and OSB substrates must be gapped 1/8 in (3.2 mm) at all edges.
 - 2. Substrate must be examined for soundness, and other harmful conditions.
 - 3. Substrate must be free of dust, dirt, laitance, efflorescence, and other harmful contaminants.
 - 4. Substrate must be installed to ensure all stucco surfaces will be true, level, and plumb without requiring additional or uneven thickness of stucco materials or finishes.
 - 5. Substrate construction in accordance with substrate material manufacturer's specifications and applicable building codes.
- D. Advise Contractor of discrepancies preventing proper installation of stucco materials. Do not proceed with stucco work until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Coordinate accessory terminations with Project's Sealant Section to ensure required spacing for joint dimensions.
- B. Concrete Masonry Units: Remove projecting joint mortar so it is flush with the plane of the wall. Remove surface contaminants such as efflorescence, existing paint or any other bond inhibiting material by sandblasting, waterblasting, wire brushing, chipping or other appropriate means. Pre-moisten the surface with water just prior to placement of stucco, or apply one uniform coat of acrylic emulsion additive according to application instructions.

3.03 MIXING

- A. Mix proprietary products in accordance with manufacturer's instructions and applicable Product Data Sheets.
- B. Admixtures must be approved for use in writing by an authorized CTS Cement Manufacturing Technical Representative prior to use.

APPLICATION

- C. General: Stucco assembly and its related materials must conform to the requirements of **ICCES Evaluation Report No. 2671** and this specification.
- D. Comply with stucco manufacturer's instructions for cold and warm weather installation.
- E. Stucco Basecoat:
 - 1. Over Concrete Masonry Unit: Apply stucco basecoat by hand trowel or pneumatic gun in one coat to a minimum 3/4" thickness (including scratch coat and brown coat). Basecoat must be brought to grounds, straightened to

- a true surface, and finished with texture to ensure adequate bond with the finish coat.
 - 2. Rod the surface to true plane and float to densify.
 - 3. Trowel to smooth and uniform surface to receive sand texture finish.
- F. Curing:
- 1. Stucco Basecoat: Using Rapid Set® Stucco Mix immediately begin moist curing for at least 90 minutes by lightly fogging stucco surfaces with clean, potable water as needed to maintain a wet sheen after material has hardened.
 - 2. Complete all work in the same plane and panel each day. Do NOT stop work short at control joints, expansion joints, etc. Avoid cold joints.
 - 3. Apply primer and finish to a minimum 1/8" thickness.
 - 4. Comply with stucco manufacturer's instructions for cold and warm weather installation.
- G. Finish: Apply anti-graffiti coating as specified in **Section 09 90 00 – Painting and Coating**.

3.04 CLEAN-UP

- A. Remove and legally dispose of stucco material and debris from the jobsite.
- B. Remove all tools, equipment and unused materials.
- C. Clean up all overspray/splatters from surrounding surfaces.
- D. Clean all residual materials from joints.

3.05 PROTECTION

- A. Protect installed materials from water infiltration into or behind them.
- B. Protect installed stucco materials from dust, dirt, precipitation and freezing during installation.
- C. Protect installed finish from dust, dirt, precipitation, freezing and continuous high humidity until fully cured and dry.
- D. Clean exposed surfaces using materials and methods recommended by the manufacturer of the material or product being cleaned. Remove and replace work that cannot be cleaned to the satisfaction of the Project Representative.

END OF SECTION

SECTION 09 90 00 PAINTING AND COATING

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. High performance painting for stucco surfaces.
 - 2. High performance painting for touch-up finishes for aluminum members.
 - 3. High performance painting for electrical metallic tubing.
 - 4. Clear anti-graffiti coating over pre-painted/powder coated metal materials, stucco wall and precast concrete caps.
 - 5. TGIC polyester powder coat for decorative metal panel, exterior lighting, aluminum doors and gates.
 - 6. Pavement marking tape applied to exterior concrete flooring.
- B. RELATED REQUIREMENTS
 - 1. **Section 03 45 00 - Precast Concrete**
 - 2. **Section 05 07 00 - Decorative Metal Panel**
 - 3. **Section 09 24 23 - Cement Stucco**
 - 4. **Section 26 05 01 - Basic Materials and Methods for Electrical Systems**
 - 5. **Section 26 56 00 - Exterior Lighting**
 - 6. **Section 32 31 24 - Aluminum Doors and Gates**

1.02 REFERENCES

- A. Comply with the requirements as listed herein. The following is a list of standards referenced in this Section:
- B. SSPC-SP2 – Hand Tool Cleaning.
- C. SSPC-PA 1 – Touch Up Shop-Primed Surfaces
- D. ASTM D4592 – Pavement Marking
- E. ASTM D4258-83 – Clean Surfaces
- F. TT-P-1511B - Pigmented Bonding Coat Alkali Resistance

1.03 SUBMITTALS

- A. Specified in **Section 01 33 00 - Submittal Procedures**
- B. Approval Submittals:
 - 1. Product Data Sheets.
 - 2. Manufacturer's Standard Color Selection Charts.
 - 3. Manufacturer's Instructions.

4. Draw-Down Cards:
 - a. Provide draw-down cards not less than twelve (12) by eighteen (18) inches for each product, finish, and texture combination.

C. Quality Assurance Submittals:

D. Verification documentation of the Applicator's Qualifications.

Close-Out Submittals:

1. Product information including color codes, product name, and sheen for each product used.
2. Product manufacturer written maintenance and cleaning data for each system and paint type.
3. 1-Gallon of each top-coat product and sealer in each color used on the project for owner touchup.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.

B. Applicator Qualifications:

1. Qualified and competent in the Work of this Section with a minimum of 5 years applying the coating systems specified in this section to commercial or industrial projects.

C. Pre-Application Conference:

1. Schedule a pre-application conference not less than seven (7) working days in advance of the date related Work is to begin.

D. Source Limitations:

1. Use products of a single manufacturer for the components of each specific coating type.
2. Do not substitute products without Project Representative's written acceptance.

E. Mockups:

1. Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - a. Project Representative will select one surface to represent surfaces and conditions for application of each paint system specified in this Section.
 - b. Vertical and Horizontal Surfaces: Provide mockups of at least 5 square feet.

2. Final approval of color selection, finish and gloss will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by the Project Representative at no added expense to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Project Representative specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store in original protective packaging until time of application.
- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at the temperature recommended by the Manufacturer, but not less than 45 degrees F.
- C. Maintain containers in clean condition, free of foreign materials and residue.
- D. Remove rags and waste from storage areas daily.

1.06 PROJECT CONDITIONS

- A. Environmental Conditions: Comply with the requirements of Manufacturer's Instructions, and this Section. Where these requirements conflict, the more stringent requirement shall apply:
 1. Do not perform work of this Section when the relative humidity exceeds eighty-five (85) percent.
 2. Do not perform Work of this Section when air temperatures are within five (5) degrees Fahrenheit of the dew point.
 3. Do not attempt to apply paints to any surfaces which are sweating, damp, wet or otherwise compromised by presence of moisture.
 4. Do not apply when conditions are outside of product manufacturer's written limitations.
- B. Lighting:
 1. Provide adequate temporary lighting to attain surface lighting level, and not less than fifteen (15) foot candles per square foot, measured at the work surface.
 - a. Conform to more stringent lighting requirements when required by governing codes.

1.07 WARRANTY

- A. Provide Manufacturer's written warranty against defects in materials and workmanship and agreeing to repair or replace components that fail during the warranty period.

- B. Warranty period for work of this section is one year commencing on the date of Substantial Completion.

PART 2 PRODUCTS

2.01. MANUFACTURERS

- A. Subject to compliance with requirements of the Contract Documents, products of the following manufacturers may be incorporated in the Work of this Section:
1. PPG: www.ppgpaints.com
 2. A & I Coating: www.aicoatings.com
 3. Rain Guard: www.rainguard.com

2.02 COATING C-1 WATERBORNE SPRAY APPLIED ACRYLIC

- A. Characteristics:
1. Industrial weather resistant acrylic waterborne enamel, primer and multi-coat finish-coat system.
 2. Surfaces: suitable for aluminum, ferrous metals, stainless steel, and galvanized metal surfaces in exterior environments.
 - 1) Color – Bronze: “Metropolis: PPG1006-7”
- B. Preparation: Surface must be fully clean, cured, and dry without dust, dirt, chalk, oil, grease, or mildew.
- C. Components:
1. Source limitation: All components shall be from the same Manufacturer.
 2. Primer: Suitable primer for industrial acrylic waterborne enamel.
 - a. Acceptable Products:
 - 1) PPG High Performance Coatings, ‘Pitt-Tech DTM Industrial Enamels’, ‘90-712 primer’.
 - b. Coats: As indicated on finish schedule.
 - c. Finish: Gloss.

2.03 COATING C-2 PIGMENTED BONDING COAT SPRAY APPLIED

- A. Characteristics:
1. Epoxy ester bonding primer
 2. Surfaces: suitable to prime and seal stucco surfaces in exterior environments.
 3. Pigmented to match color indicated for each site location.
 - a. Site A – Color “Kalispell: PPG0998-3”
 - b. Site B – Color “Easy: PPG1026-3”
- B. Components:
1. Source limitation: All components shall be from the same Manufacturer.
 2. Primer: Suitable primer for epoxy ester bonding primer.
 - a. Acceptable Products:

- 1) PPG High Performance Coatings, 'PERMA-CRETE® Pigmented Bonding Coat.
- b. Coats: As indicated on finish schedule.
- c. Finish: Flat.

2.04 C-3 ANTI-GRAFFITI COATING

- A. Characteristics:
 1. Suitable as part of a graffiti resistant coating system including clear factory applied coil topcoat over pre-finished color layer for use with graffiti removal solvent.
 2. Suitable for use on metals in exterior, high wear, weather exposed areas.
 3. Suitable for use applied over high performance coatings.
 4. Suitable for use applied over polyester powder coat systems.
 5. Suitable for use over cement stucco applications.
 6. Suitable for use over precast concrete surfaces.
- B. Preparation: Prepare surfaces using approved manufacturer's written instructions for cleaning, storage, and application.
- C. Components:
 1. Clear Finish Coat:
 - a. Acceptable Products:
 - 1) Envirothane 8480 Non Sacrificial Anti-Graffiti Coatings
 - 2) VandlGuard® Non-sacrificial Anti-Graffiti Coating
 - b. Sheen: Medium gloss (25-35).
 - c. Color: non-pigmented clear coating.
 - d. Application thickness, nominal: .45 mils to .55 mils.
 - e. Apply as a topcoat over products included the following sections:
 - 1) **Section 03 45 00 Precast Concrete**
 - 2) **Section 05 07 00 Decorative Metal Panel**
 - 3) **Section 09 24 23 Cement Stucco**
 - 4) **Section 26 56 00 Exterior Lighting**
 - 5) **Section 32 31 24 Aluminum Doors and Gates**

2.05 C-4 TGIC POLYESTER POWDER COAT

- A. Characteristics:
 1. Suitable for factory applied electrostatically applied powder coating for exterior luminaires, poles, and base covers in weather exposed areas at Site A.
- B. Preparation: Prepare surfaces using approved manufacturer's written instructions for cleaning, storage, and application.
- C. Decorative Metal Panel Components:
 - a. Acceptable Application According to Manufacturer for decorative metal panel and support posts in **Section 05 07 00 Decorative Metal Panel**

- b. Manufacturer: Parasoleil
 - c. Sheen: Semi-Gloss Finish
 - d. Color: RAL 8019 Bronze - Smooth
 - e. Topcoat: Anti-graffiti coating as specified herein
 - f. Application thickness, nominal: per manufacturer
- D. Exterior Lighting Components:
- a. Acceptable Application According to Manufacturer for post top luminaires, poles, and base covers in **Section 26 05 01 Basic Materials and Methods for Electrical Systems**
 - b. Manufacturer: US Architectural Lighting
 - c. Sheen: Semi-Gloss Finish
 - d. Color: RAL-8019-S Bronze-Smooth
 - e. Topcoat: Anti-graffiti coating as specified herein
 - f. Application thickness, nominal: per manufacturer
- E. Aluminum Doors and Gates Components:
- a. Acceptable Application According to Manufacturer for gates and doors components in **Section 32 31 24 Aluminum Doors and Gates**
 - b. Manufacturer: PalmSHEILD
 - c. Sheen: Semi-Gloss Finish
 - d. Color: RAL 8019 Bronze - Smooth
 - e. Topcoat: Anti-graffiti coating as specified herein
 - f. Application thickness, nominal: per manufacturer

2.06 COATING C-5 PAVEMENT MARKING

- A. Characteristics:
- 1. Self-adhesive tape
 - 2. Skid-resistant
 - 3. Apply to asphalt or concrete. Conforms to surface.
 - 4. Temperature range is -40°F to 200°F.
 - 5. Manufactured for use on concrete as a safety-striping product.
- B. Preparation: Surface must be fully clean, cured, and dry without dust, dirt, chalk, oil, grease, or mildew and prepared using Manufacturer's written instructions.
- C. Components:
- 1. Source limitation: All components shall be from the same Manufacturer.
 - a. Width: 4"
 - b. Color: 'Yellow'
 - c. Acceptable Products:
 - 1) 3M A271ES Stamark™ Model No. 19408
 - 2) Seton Model No. 24841
 - 3) McMaster-Carr Model No. 37835T2
 - 4) Or Approved Equal.

2.07 PAINT SCHEDULE

- A. Coating C-1 Waterborne Spray Applied Acrylic
 - 1. Framing: Aluminum Doors and Gates
 - a. (1) coat primer.
 - b. (1) coat gloss.
 - 2. Touch up for aluminum decorative metal panel and framing members, angles, plates, hardware, and attachment accessories
 - a. (1) coat primer.
 - b. (1) coat gloss.
- B. Coating C-2 Epoxy Ester Bonding Primer Spray Applied
 - 1. Stucco
 - a. (1) coat primer.
- C. Coating C-3 Anti-Graffiti Coating
 - 1. All exterior painted metal surfaces.
 - 2. All exterior precast concrete caps.
 - 3. All exterior painted stucco wall surfaces.
 - 4. Factory-apply coating to manufacturer's recommended dry-film thickness.
- D. Coating C-4 Polyester Powder Coat
 - 1. All decorative metal panel and hardware for Site A and Site B.
 - 2. All exterior luminaires, poles, and base covers at Site A.
 - 3. All decorative aluminum gates and doors for Site A and Site B.
 - 4. Factory-apply coating to each manufacturer's recommended dry-film thickness.
- E. Coating C-5 Polyurethane Pavement Marking
 - 1. Location and pattern as indicated on drawings.
 - 2. Pavement marking tape, 4" width.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify conditions are satisfactory to receive the Work of this Section.
- B. Do not commence work until unsatisfactory conditions have been corrected.
- C. Beginning of Work constitutes acceptance of conditions.
- D. Confirm that pre-primed surfaces are acceptable to the Manufacturer of finish coats specified in this Section.

3.02 PREPARATION

- A. Comply with Manufacturer's applicable to particular substrates.

- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
- C. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed.
- D. Remove surface-applied protection if any.
- E. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
- F. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat recommended by the Manufacturer as required to produce paint systems indicated.
- G. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- H. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods described in the Manufacturer's Instructions, but not less than the following:
 - 1. **SSPC-SP 2, Hand Tool Cleaning**
- I. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with **SSPC-PA 1 for touching up shop-primed surfaces**.
- J. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- K. Aluminum Substrates: Remove surface oxidation.

3.03 APPLICATION

- A. Manufacturer's Instructions:
 - 1. Comply with Manufacturer's Instructions, including technical bulletins and product catalog data.
 - 2. Contact the Manufacturer's Technical Representative to confirm appropriate procedures particular to the Project prior to beginning application.
 - 3. Retain Manufacturer's Instructions at the Project Site.

- B. Apply paints according to Manufacturer's Instructions and the requirements of this Section.
- C. Use applicators and techniques suited for paint and substrate indicated.
- D. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
- E. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- F. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- G. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat Manufacturer.
- H. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- I. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- J. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, or other surface imperfections. Cut in sharp lines and color breaks.

3.04 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Touch up and restore painted surfaces damaged by testing at no additional cost to the Owner.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint Manufacturer's Instructions, Contractor shall pay for additional testing and apply additional coats as needed to provide dry film thickness that complies with paint Manufacturer's Instructions.

3.05 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application.
 - 1. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by the Project Representative, and leave in an undamaged condition.

- B. After completing paint application, clean spattered surfaces.
 - 1. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
- E. Where touch up and restoration cannot return surface to as-new condition, strip and repaint entire surface of component. Where it is not practicable to do so, replace entire component and paint as directed in this Section.

END OF SECTION

SECTION 26 05 00 COMMON WORK FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 00, Division 01, Division 26, and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that apply to work under this Specification.

1.02 GENERAL REQUIREMENTS

- A. Review the Specifications and Drawings for coordination with additional requirements and information that apply to work under this Section.
- B. Provisions within the Specifications and Drawings describe minimum guidelines for electrical installations.
- C. All electrical installations shall comply with the code requirements of NFPA 70 (NEC), NFPA 72, NFPA 90, WAC/RCW, Americans with Disabilities Act (ADA) and all local codes and ordinances.
- D. Where industry standard design practices are published for use by design professionals, such guidelines shall be used as a minimum basis of design; e.g., IESNA Recommended Practices, BICSI Communication Distribution Standards, ANSI/TIA/EIA Standards and IEEE Publications.
- E. Electrical efficiency, life-cycle cost and maintainability of proposed systems shall be considered prior to product selection.
- F. Availability (lead times) and potential obsolescence shall be considered during product selection. Potential long-lead items shall be reviewed with the Owner's Representative at the Pre-construction meeting.
- G. All low-voltage cables shall be labeled with computer printed, sleeve type, wire markers. The designation on the wire markers shall match those on the shop drawings.

1.03 SUMMARY

- A. Provide supervision, labor, materials, tools, equipment/machinery, temporary power and lighting, and other services necessary to complete the work for complete operations described herein and as shown on the Drawings.

- B. The provisions of the General Conditions, Special Conditions, and General Requirements apply to the work as if specified in this Section and other Sections of the Specifications. Provide the electrical work as indicated or specified in other Sections of the Specifications and Drawings of the Contract Documents.
- C. Execute electrical work in strict accordance with the latest edition of the National Electrical Code and governing local ordinances, codes, and regulations. Assure the strict conformity of electrical equipment, materials, construction methods, tests, and definitions with the established standards of the following in their latest adopted revision: Underwriter's Laboratories, Inc. (UL), and National Electrical Manufacturers Association (NEMA).
- D. Furnish and install all equipment in the Contract in harmony with other trades to provide completed systems with neat, finished appearance, using accepted methods of the trade. Only good workmanship will be accepted. If, in the judgment of the Owner's Representative, any portion of work not installed in a workmanlike manner or left in a rough, unfinished condition, remove the equipment, reinstall same, patch and paint surrounding surfaces satisfactory to the Owner's Representative, with no increase in cost.
- E. Mounting details of equipment, devices, light fixtures, raceways, junction boxes and the like are not usually shown or specified. Provide per industry standard practice and code requirements as necessary for proper installation and operation the same as if herein specified or shown.
- F. Provide installation means and methods of all equipment, devices, light fixtures, raceways, junction boxes and the like per industry standard practice and code requirements as necessary for proper configuration and operation as if herein specified or shown.
- G. All installations shall comply with ADA requirements.
- H. Purchase permits, licenses, and acceptances required for execution of the Work.
- I. Test the entire electrical installation to assure compliance with Codes and proper system operation.

1.04 CALCULATIONS AND LABELLING

- A. Provide complete Arc-Flash Hazards Calculation Report and label all equipment required per NFPA 70E to properly identify arc-flash hazards. Contractor is required to pay for and submit Arc-Flash Hazards Calculation to the Project Representative for review and acceptance prior to commencing work.

1.05 REFERENCES

- A. National Fire Protection Association (NFPA):
 - 1. NFPA 70 – National Electrical Code.

2. NFPA 70E – Standard for Electrical Safety in the Workplace.
3. NFPA 5000, 2018 Ed.
4. NFPA 1, 2018 Ed.
5. National Electrical Manufacturers Association (NEMA).

B. Underwriters Laboratories (UL).

1.06 DEFINITIONS

- A. The terms “or other reviewed and accepted Manufacturers”, “or accepted equal” and “or equal” means final acceptance by the Project Representative of a material or piece of equipment substituted for that which is shown in the Contract Documents.
- B. The word “provide” as used in these Specifications or on the Drawings shall mean “furnish, install, and complete connection per factory instructions”.
- C. The term Mechanical Contractor (M.C.) and Electrical Contractor (E.C.) as used in these Specifications or on the Contract Drawings, refer to those subcontractors working under the direction of the General Contractor (G.C.).
- D. The term “Engineer” shall refer to the licensed professional electrical engineer who is responsible for the preparation of the electrical documents.

1.07 EQUIPMENT

- A. All materials shall be UL listed and labeled.
- B. The interior of all electrical equipment shall be thoroughly cleaned prior to final acceptance.
- C. All equipment and receptacles shall have permanent panel name and circuit number on equipment, disconnects, cover plates, etc.

1.08 SUBMITTALS

- A. Acceptance Submittals:
 1. Statement of Manufacturer’s Qualifications.
 2. Statement of Installer’s Qualifications.
 3. Product Data: Submit and clearly identify product data, selection, and options.
 4. Shop Drawings: Submit all required shop drawings. Where product data and shop drawings are required for the work, submit both at the same time.
- B. Shop Drawings:
 1. Shop drawings produced in AutoCAD shall be provided for each low-voltage system (data, fire alarm, security, etc.) and specialty systems (lighting controls, etc.). Shop drawings shall show all device-to-device wiring. All as-builts shall be delivered in electronic format.

2. Shop drawings shall be based on the final room numbers established by the Project Representative; not the room numbers shown on the Architectural Floor Plans.
3. Provide as-built shop drawings for all systems. As-builts shall show the locations of all components, conduit runs and cables utilized.

C. Quality Assurance Submittals:

1. Test and Inspection Results.

D. Closeout Submittals:

1. Operations and Maintenance Manual Content.
2. Spare Parts and Materials.

E. Substitutions:

1. Conform to **Section 00 73 00 - General Provisions & Section 01 60 00 - Product Substitutions.**
2. The naming of a certain brand or make or manufacturer in the Specifications is to establish a quality standard for the article desired. The Contractor is not restricted to the use of the specific name brand or manufacturer unless so specified as "no substitution". However, substitution request is required and permitted only as specified in **Section 00 73 00 – General Provisions & Section 01 60 00 - Product Substitutions.**
3. The Contractor shall assume full financial responsibility for any and all additional expenses arising from the use of a substitute product.

1.09 QUALITY ASSURANCE

- A. General: These Specifications and Drawings are intended to cover a completed installation of systems. The omission of expressed reference to any items of labor or material for the proper execution of the work in accordance with present practice of the trade shall not relieve the Contractor from providing such labor and materials. Refer to the Drawings and Shop Drawings or other trades for additional details, which affect the proper installation of this work.
- B. Conform to requirements of **NFPA 70.**
- C. Conform to the latest edition of the NECA Standards for good workmanship in the electrical construction manual.
- D. Provide all equipment included and as necessary and in harmony with other trades to provide completed systems with neat, finished appearance, using accepted methods of the trade. Only good workmanship will be accepted. If, in the judgment of the Owner's Representative, any portion of the work has not been installed in a workmanlike manner or left in a rough, unfinished condition, remove the equipment, reinstall same, patch and paint surrounding surfaces satisfactory to the Owner's Representative, with no increase in cost to the Owner.

- E. Before submitting bid, Contractor is strongly encouraged to visit the site and examine existing conditions by which to provide a complete and accurate bid.
- F. The Contractor shall provide all test equipment necessary to perform all testing requirements. Test equipment shall have been calibrated within one (1) year of its use on this Project.
- G. Installer Qualifications: An authorized representative who is trained and accepted by the manufacturer.

1.10 WARRANTY

- A. Warranty workmanship and components of the work for a period of one-year from the date of substantial use. Remedy any defects in workmanship and repair or replace any faulty equipment that fails within the warranty period without additional cost to the Owner. Replace all defective units at the time of final acceptance.
- B. Refer to other Sections for additional warranty requirements.

1.11 CLOSEOUT DOCUMENTS

- A. Conform to **Section 01 78 00 - Closeout Submittals**.
- B. Record Drawings: Maintain a set of full-size Contract Plans at the site on which all changes and modifications are recorded. All marks shall be in red pencil in a legible, neat manner. These drawings shall be reviewed monthly prior to final acceptance of pay request. Upon completion of the Project, the Contractor shall submit these drawings for final acceptance.
- C. Operation and Maintenance Manuals: Conform to **Section 01 78 00 - Closeout Submittals**.
- D. Warranties:
 - 1. Conform to **Section 00 73 00 – General Provisions**.
 - 2. Submit one-year warranty on all materials under the Contract work (excluding lamps). Refer to other Sections for additional warranty requirements.
 - 3. Submit all subcontractor warranties.
 - 4. Submit all manufacturer warranties.

1.12 OPERATION AND MAINTENANCE MANUALS

- A. Provide Operation and Maintenance Manuals in accordance with **Section 01 78 00 - Closeout Submittals**.
 - 1. Provide one preliminary bound set of Operation and Maintenance Manuals including maintenance information and parts list furnished by the manufacturer with the equipment, together with supplementary drawings where necessary to itemize serving and maintenance points. Include periodic

maintenance, methods of operation, seasonal requirements, manufacturer's data and warranty forms. Provide address and 24-hour phone number of firm responsible under warranty. Items requiring service or correction during the warranty period shall be serviced within 24-hours of notification by the Owner. Data in manuals shall be neat, clean copies, and posted on 8-1/2" x 11" sheets, typed, operation and maintenance instructions for each item of equipment installed. Drawings shall be accordion folded. An index shall be provided with all contents listed in an orderly presentation according to Specification Section.

2. Number of Copies: The preliminary set of the O&M Manual shall be presented to the Owner's Representative for review of content. After this set has been reviewed and accepted, two or as indicated in **Section 01 78 00 - Closeout Submittals**, additional copies shall be provided.
3. Binding: Binders shall be as specified in accordance with **Section 01 78 00 - Closeout Submittals**, or if not specified in Division 01, binders shall be single touch, locking, D-Ring Type. Covers shall be black printed with the name of the job, the Owner, Architect, Engineer, Contractor, and the year of completion. The back edge shall be imprinted with the name of the job, the Owner, and the year of completion. Each copy shall have typewritten index and tabbed dividers between equipment categories. Binder shall have sufficient capacity to contain all data sheets and not exceed 3/4 of fill capacity.

1.13 DELIVERY, STORAGE, AND HANDLING

- A. Schedule materials, equipment, and light fixture deliveries and make all arrangements as necessary to complete all work in accordance with the project construction schedules. Provide schedules of work to the Owner's Representative as directed during construction.
- B. Schedule deliveries and unloading to prevent traffic congestion, blocking of access, and interference with work. Arrange deliveries to avoid larger accumulations than can be suitably stored at site. Provide for continuity of supply to avoid change of supplier or change in brand of materials during any phase of work.
- C. Deliver packaged materials to site in manufacturer's original, unopened, labeled containers. Do not open containers until approximate time for use. Store materials at locations that will not interfere with progress of work. Arrange locations of storage areas in approximately order of intended use.
- D. Store materials in a manner that will prevent damage to materials or structure, and that will prevent injury to persons. Store cementitious materials in dry, weathertight, ventilated spaces. Store ferrous materials to prevent contact with ground and to avoid rusting and damage from weather.

- E. Provide documentation to the Owner's Representative for any claim of material, equipment and light fixture deliveries not able to meet construction schedules.

1.14 PROJECT CONDITIONS

- A. Field verify and examine existing conditions.
- B. Verify requirements for temporary electrical power and construction power. Temporary electrical power must be provided to keep existing facilities fully operational during construction. Contractor shall be responsible to insure compliance with this requirement.
- C. Verify requirements for permanent power and telecommunication service requirements.
- D. Identify existing conditions and requirements for cutting, patching, excavation, core drilling, etc.
- E. Include all costs to provide the electrical installation associated with the existing conditions for the best workmanship and operation according to the Specifications and Drawings.
- F. Report to the Owner's Representative any condition that might prevent the installation of the equipment in the manner intended.

PART 2 PRODUCTS

2.01 GENERAL

- A. Naming of manufacturers indicates the manufacturer's brand name is acceptable only if their product is in compliance with each and every provision of this Specification. Failure to comply will result in non-acceptance.
- B. Supplier and/or Electrical Contractor shall be responsible to ensure that material or equipment is of the same size, quality, capacity, weight, and electrical characteristics as that specified. The Contractor/Supplier shall pay any changes and costs required during construction due to Contractors/Suppliers neglect to properly select equipment.
- C. Notify Owner's Representative for an on-site visit to inspect material and equipment prior to installation.
- D. Materials and equipment shall be new, undamaged, and shall be UL listed for its use.
- E. Defects and damages of material shall be replaced, furnish any new material as necessary and install the system at the Contractor's expense.

- F. Furnish material and equipment samples when requested by the Owner's Representative, within 21-days of request.
- G. Non-accepted material and equipment must be removed from the jobsite.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting the performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 GENERAL

- A. Provide conduit, wiring, and all components indicated on schedules and diagrams.
- B. Before any installation, devices or equipment can be directed or located by the Owner's Representative within 20-feet of the designed contract location without extra cost.
- C. Device or equipment mounting height given herein the Specifications, Contract Drawings, and/or documents are intended to provide general guidelines pursuant to industry standards. Such guidelines may not be exact or accurate and may or may not conflict with other trades installation without verification.
- D. Provide field coordination and verification with other contractors, trades, or any shop drawings, and ensure that such mounting heights if indeed are practical and feasible as not to conflict with other installation and construction. If conflicts are discovered at any time during the construction, report to the Owner's Representative immediately for resolution.
- E. If the Contractor fails to provide such coordination and field verification and results of erroneous installation, the Contractor shall remedy such installation per Owner's Representative direction, at Contractor's cost.

3.03 MANUFACTURER'S DIRECTIONS

- A. Apply, install, connect, and erect manufactured items or materials according to the recommendations, wiring diagrams, instructions of the manufacturer when such recommendations are not illustrated or in conflict with the Contract Documents.

- B. Furnish to the Owner's Representative on request, copies of manufacturer's recommendations. Secure acceptance of recommendations before proceeding with work.
- C. Keep at the site not less than one copy, in good condition, of manufacturer's recommendations, wiring diagrams, instructions, or directions, pertaining to work at the site. Inform involved personnel of requirements and availability of manufacturer's recommendations.

3.04 UTILITY STANDARDS

- A. All work associated with electrical power and telecommunications utilities shall be installed in accordance with the standards and specifications established by the serving utility.
- B. Contact electrical power and telecommunications utilities. Verify and coordinate work scope prior to commencement of installation.

3.05 CONTINUITY OF BUILDING AND UTILITY SERVICES AND SHUTDOWNS

- A. Continuity of utilities services in the building shall be maintained at all times as required to provide heat, water, lighting, and power to all portions of all buildings. Utility systems shutdowns required for extensions, alterations or connections of new services shall be accomplished in accordance with the following requirements.
- B. Shutdowns: Utilities shutdowns shall be scheduled for weekends, holidays, or at night if the shutdown affects the use of the Owner's buildings. The actual time and date will be coordinated with and accepted by the Owner at least 2-weeks in advance and confirmed 48-hours prior to shut down. Contractor shall be required to provide temporary power as required by the Owner to keep facilities operational during utility shutdowns. Coordinate with Owner.
- C. Costs: Pay all costs associated with utilities shutdowns. No extra payment will be made for overtime work, schedule changes, or failure to complete utilities connections within authorized shutdown periods.

3.06 COORDINATION

- A. The drawings are diagrammatic and indicate generally the locations of materials and equipment. These drawings shall be followed as closely as possible. Coordinate the work under this section with other trades for exact dimensions, clearances, and roughing-in locations. Cooperate with other trades in order to make minor field adjustments to accommodate the work of others.
- B. Coordinate wiring interconnections for the complete operation of electrical-mechanical equipment to include items provided by other divisions. Examine

equipment connection information with manufacturer's shop drawings and submittals.

- C. Refer to project Construction Schedules. Schedule each specific area so that the delivery of materials and equipment are such as to cause no delay in Construction Schedules. Include the premium cost of delivery of equipment and overtime work in order to comply with the Construction Schedule if necessary.
- D. Coordinate and verify exact locations of wiring devices, light fixtures, and communication devices and equipment prior to beginning of rough-in.
- E. If directed by the Owner's Representative, the Contractor shall, without extra charge, verify with local inspectors or authorities having jurisdiction, and make reasonable modifications in the layout as needed to prevent conflict with work of other trades of for proper execution of the work.

3.07 RACEWAYS

- A. One-line diagrams, risers, and conduit routing are schematic and are not showing exact physical arrangement of equipment or exact routing of conduit. Coordinate conduit routing with all other trades.
- B. Where indicated on Drawings, junction boxes and pull boxes are minimum requirements. Provide other fittings and pull boxes of adequate size in the raceway system wherever necessary or required by the National Electrical Code. Allow a maximum of four-quarter bends between pull boxes in each run of conduits.
- C. Provide expansion joint fittings for conduits passing through new or existing expansion joints installed between buildings. Verify exact locations and details of expansion joints prior to work.
- D. Coordinate conduit routing, pull box and equipment locations with other trades to avoid conflicts of equipment installations.
- E. All empty conduits shall have pull wires.
- F. Provide Unistrut mounting channels, hanger rods, anchor bolts and fittings to support conduits and pull boxes. See **Section 01 73 24 - Design Requirements for Non-Structural Components and Non-Building Structures**.
- G. Work shall comply with National Electrical Code requirements.

3.08 MISCELLANEOUS

- A. Support all conduits and equipment in accordance with the National Electrical Code and the International Building Code.

- B. Cutting and Patching: Perform cutting and patching as may be necessary for the proper installation of the electrical work. Grout around raceway penetrations and fill anchor bolt holes or spalled areas. Core drill new penetrations through existing structural walls, ceilings, and floor slabs.
- C. Cleanup: The premises must be kept free of accumulated materials, rubbish, and debris at all times. Surplus materials, tools, and equipment must not be stored at the building. At the completion of the job, equipment and fixtures shall be left clean and in proper condition for their intended use.
- D. Trenching: Perform excavation and backfill as may be necessary for the proper installation of the Electrical work, unless noted otherwise on the Drawings.
- E. Demolition: Electrical demolition shall be performed by the Electrical Contractor as indicated on Plans and other sections of the Contract Documents.
- F. Installation Details: Prepare and submit to the Owner's Representative detail sketches indicating equipment installation information with locations and dimensions.
- G. Tests: Test wiring and electrical equipment to verify absence of grounds and short circuits and verify proper operation, rotation, and phase relationship. Demonstrate operation of all equipment in accordance with the requirements of this Specification and the manufacturer's recommendations. Perform tests in the presence of the Owner's Representative. Provide instruments and personnel required to conduct these tests.

3.09 DRAFT STOPS AND FIRE STOPS

- A. Verify with Architectural Plans and to maintain the integrity of the draft stops whenever work requires penetration of these areas. Patch as required to maintain integrity of stops.
- B. Maintain fire-resistance ratings of walls, partitions, floors, ceiling, or other fire separation barriers whenever work requires penetrations or openings for equipment. Provide and use accepted methods and fire seal material and fitting to maintain the fire resistance rating. Firestop material to be provided in product submittals.

3.10 INSTRUCTION PERIODS FOR OWNER'S PERSONNEL

- A. Scope: Following installation of work, have representatives of installation tradesmen conduct demonstrations and instruction periods to point out locations of servicing points and required points of maintenance to Owner's Representatives. Reference **Section 01 78 00 - Closeout Submittals** for additional requirements.

- B. General Description of Instruction Periods: Each period shall include preliminary discussion, and presentation of information from maintenance manuals with appropriate references to Drawings; followed by tours of building areas explaining maintenance requirements, access methods, servicing and maintenance procedures, and equipment cleaning procedures, control settings and available adjustments.
- C. Scheduling of Instruction Periods: Notice of Contractor's readiness to conduct such instruction and demonstration shall be given to Owner's Representative at least two (2) weeks prior to the instruction periods, and agreement reached as to the date at which the instruction periods are to be performed. Obtain acceptance of proposed date prior to making final arrangements.

END OF SECTION

SECTION 26 05 01

BASIC MATERIALS AND METHODS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, Division 26, and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that applies to work under this Specification.

1.02 SUMMARY

- A. Devices, material, equipment, enclosures, and assemblies shall be new, UL listed, accepted, and suitable for its environment where used.
- B. Unless noted otherwise, wiring systems shall be installed in a complete raceway system.
- C. Determine the exact electrical requirements of equipment from the equipment suppliers prior to rough-in.
- D. All installations shall comply with ADA requirements.

1.03 REFERENCES

- A. National Fire Protection Association (NFPA) – www.nfpa.org:
 - 1. NFPA 70 – National Electrical Code.
 - 2. NFPA 70E – Standard for Electrical Safety in the Workplace.
- B. International Code Council – www.iccsafe.org:
 - 1. IBC – International Building Code.
 - 2. IFC – International Fire Code.
- C. National Electrical Manufacturers Association (NEMA).
- D. Underwriters Laboratories (UL).

1.04 EQUIPMENT FINISH

- A. Electrical equipment, control panels, and cabinets, shall be furnished factory painted in the manufacturer's standard colors unless otherwise specified.
- B. Unfinished materials and equipment except conduit, shall be cleaned, primed and painted by the Electrical Contractor as directed by the Owner's Representative in accordance with the Painting Section of the Specifications.

Portions of conduit may be required to be painted where indicated on drawings.
See **Section 09 90 00 – Painting and Coating**.

- C. The colors of exposed electrical materials and apparatus shall be as selected by the Owner's Representative.

1.05 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation instructions, use limitations and recommendations for each material used. Provide certifications stating that materials comply with requirements.

1.06 QUALITY ASSURANCE

- A. Source: For each type of material required for the Work of this Section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturers of the primary materials.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage.
- B. Make all necessary provisions for storing materials and equipment at the site to insure the quality and condition of the material to be installed. Utilize only new materials which are free of defects and which arrive at the jobsite unopened in the original container.

1.08 COORDINATION

- A. Coordinate location of raceways, supports, cable trays and electrical equipment with other trades.
- B. Determine the exact electrical requirements of all equipment from the equipment suppliers prior to rough in wiring. Refer any discrepancy between the Drawings and equipment requirements to the Project Representative for resolution prior to installation.
- C. Construction Observation: Advise the Project Representative at least two (2) full working days prior to the covering of concealed electrical work.

PART 2 PRODUCTS

2.01 GENERAL

- A. Furnish all items of the materials, design, sizes, and ratings specified herein.

- B. All devices, equipment, enclosures, and material shall be UL listed, Project Representative accepted, and suitable for its environment where used.

2.02 RACEWAYS AND FITTINGS

- A. All raceways shall be 1/2" minimum and 3/4" minimum for homeruns.
- B. 3/4" raceways shall have no more than six (6) #12 AWG conductors.
- C. Minimize the use of flexible metallic conduit. Flexible conduit shall only be used for light fixture connections, interior equipment connections, expansion and seismic joints, and sound control. Flexible metallic conduit shall not be used in concealed locations.
- D. Electrical Metallic Tubing (EMT): Hot dipped galvanized or sherardized steel. Utilize compression type with insulated throat in interior locations and steel rain tight type in exterior locations. Cast metal shall not be used.
- E. Rigid Galvanized Steel (RGS): Rigid metal conduit shall be galvanized steel type. Conduit fittings and accessories shall be listed for use with RGS.
- F. Polyvinyl-Chloride (PVC): Rigid PVC conduit shall be used in ductbanks and encased in concrete where noted on Drawings.
- G. Flexible Steel Conduit: Interlocking single strip, hot-dipped galvanized or sherardized, liquid-tight when used in wet or damp locations. Fittings shall be screw wedge type or liquid-tight type depending on conduit type used. Provide grounding fittings for ground wire installation outside conduit.
- H. Concealed raceways shall be secured with heavy-duty, single-hole, steel straps. Nail-in style straps shall not be used.
- I. Exposed raceways shall be secured with heavy-duty, two-hole, steel straps.
- J. Raceways shall be supported independently from the ceiling suspension system, cable trays, ducts, and piping.
- K. Pendant mounted groups of raceways shall be supported by 1-5/8" square preformed channel (Unistrut).
- L. Cap or plug the ends of below grade conduits to prevent concrete and other materials from obstructing conduits.
- M. Wherever buried, non-metallic, conduit passes through an expansion or contraction joint, or where required to compensate for thermal expansion and contraction, provide a conduit expansion joint. Install the conduit to cross the joint at right angles.

- N. Pull Wires: Provide a pull wire in all empty raceways:
1. Use nylon pull-wires of tensile strength not less than 240-pounds in each conduit and duct, leave pull-wires in ducts and conduit after cleaning.
 2. No splices in pull-wire will be allowed.
 3. Leave ample slack length at each end of pull-wire.

2.03 PATHWAYS FOR LOW-VOLTAGE SYSTEMS

- A. Provide a complete conduit pathway system for all low-voltage wiring.
- B. Provide a pull wire in all empty raceways.

2.04 WIRE AND CABLE

- A. Branch circuit wiring shall be #12 AWG copper minimum unless indicated otherwise. Conductors #10 AWG and smaller shall be solid copper with Code grade insulation and a minimum temperature rating of 75 deg C.
- B. Branch circuit ground wire, isolated ground wire, equipment grounding conductor and grounding electrode conductors shall be insulated the same as the circuit or feeder conductors.
- C. Conductors #8 AWG and larger shall be stranded copper, with Code grade insulation and a minimum insulation temperature rating of 75 deg C, and connected to equipment by means of compression type terminal lugs. Compression lugs shall be hydraulic compression only. Mechanical compression methods are not acceptable. Provide two-hole lugs of AL/Cu type only. Single hold lugs are not acceptable.
- D. Marking: Wire must be marked at 2' intervals with gauge, insulation type, and manufacturer. Label feeders at each end of phase designation.
- E. Low voltage wiring and cables specified herein by Divisions 26 or 28 shall be installed in a complete raceway system.

2.05 JUNCTION AND PULLBOXES

- A. Manufacturers: Bower, Raco or Steel City. Boxes exposed to weather shall be Crouse Hinds or accepted equal cast aluminum type.
- B. Electrical boxes shall conform to UL-50, "Standard for Electrical Enclosures" and UL-514, "Standard for Electrical Outlet Boxes and Fittings".
- C. Provide electrical boxes of the material, finish, type, and size indicated and required for the location, kind of service, number of wires, and function.
- D. Electrical boxes that are shown on the Drawings with no indication of size shall be provided in accordance with the NEC.

- E. Junction boxes, pull boxes, and outlet boxes shall be pressed steel with knockouts and matching cover as required with size, depth, and shape best suited to the location and intended service. Cover on finish area shall be provided with specification grade quantity type to match finish surface. Include plaster or tile rings as required.
- F. Provide neoprene gaskets 1/8" thick with all boxes subjected to weather.
- G. Grounding: Provide each box with a grounding terminal.
 - 1. Grounding Terminal: Either a green-colored washer-in-head machine screw not smaller than 10-32 in a drilled and tapped hole in the back of the box or a grounding bushing with green-colored machine screw terminal attached to one of the conduits.
 - 2. Install grounding jumpers as specified in **Section 26 05 26 - Grounding and Bonding**.

2.06 SUPPORTING DEVICES

- A. Provide dedicated blocking and support method to ensure secure installation of all device boxes such that the installation is capable of withstanding a minimum 50-pound pulling force without moving.
- B. Support raceway by straps, suitable clamps or hangers to provide a rigid installation. Perforated strap hangers and twisted wire attachments will not be acceptable. Do not support or fasten raceways to other pipe or in a manner to prevent the ready removal of other pipe.

2.07 GROUNDING

- A. Conform to **NEC Article 250**.
- B. Ground Wire: Color coded green, copper conductor, with insulation same as circuit or feeder conductors.
- C. Grounding Conductor: Provide green insulated equipment grounding conductor or circuit grounding conductor per **NEC 250** in raceway system. Insulation and conductor type shall be the same as circuit conductors.

PART 3 EXECUTION

3.01 RACEWAY

- A. IMC and EMT: Interior areas unless otherwise noted on plans.
- B. RGS: Exterior area with accepted weatherproof fittings.
- C. PVC: Exterior underground with RGS factory-radius elbows transitioning above ground.

- D. Flexible Conduit: Flexible metal conduit located in wet locations shall be liquid-tight type. A maximum of 72" of flexible metal conduit shall be used for the connection to motors and vibrating equipment. Flexible metal conduit shall be continuous grounding type and provide with grounding lug per spec. No flexible conduit allowed for any concealed installation.
- E. Minimum Sizes: Conduit sizes are not necessarily specified on Drawings. Provide a minimum 1/2" conduit branch circuits and minimum 3/4" conduit homeruns and multi-pole circuits. Refer to other specification sections for other minimum sizes. Contractor shall provide sizing of conduits as required to meet code where the above specified minimum sizes are too small to afford 40% fill. Conduit sizes shall be sized for conductor types and sizes per NEC.
- F. Conduit termination shall have code-sized junction box for flush or surface installation. Conduit stubs shall have nylon insulated type bushing.
- G. Pull Wires: Provide pull wires in all empty raceways. Pull wires shall be continuous in each raceway run and extend a minimum distance of 12" from the junction box or terminal at the end of the raceway.

3.02 INSTALLATION

- A. One-line diagrams, risers, and conduit routing are schematic and do not show exact arrangement of equipment.
- B. Where indicated on Drawings, junction boxes and pull boxes are minimum requirements. Provide other fittings and pull boxes of adequate size in the raceway system wherever necessary or required by the NEC. Allow a maximum of four 90-degree bends between pull boxes in each run of conduit.
- C. Provide expansion joint fittings for conduits passing through new or existing expansion joints. Verify exact locations and details of expansion joints prior to work.
- D. Coordinate conduit routing, pull box and equipment locations with other trades to avoid conflicts of equipment installations. Empty conduits shall have pull wires.
- E. Where permitted, exposed raceway shall be run parallel or perpendicular to the building. Run raceways as high as possible, unless noted otherwise.
- F. Carefully form bends to avoid injuring or flattening raceway. Raceways 1-inch trade size and larger shall utilize factory formed fittings where bends are 45-degrees or larger. Minor offsets are permitted to be filed bent. All bends in conduits serving low-voltage systems shall not have bend radii less than 10-times the nominal conduit size.
- G. Support raceways with heavy-duty, one-hole, pressed steel straps on interior surfaces and heavy-duty, two-hole, pressed steel straps on exterior surfaces.

- H. Anchor all electrical work securely to structure using fasteners accepted by a Washington State Licensed Structural Engineer for the types of structure encountered.
- I. Anchor to frame structure by means of sheet metal screws. Fasten to structural walls with lead anchors or steel expansion shells and threaded bolts or screws with slotted heads. Fasten to architectural or masonry walls with toggle bolts or molly screws. Deviation from these methods must be approved prior to installation.
- J. Furnish anchor bolts and anchorage items as required, and field check to insure proper alignment and location. Provide templates, layout drawings, and supervision at the job site to ensure correct placing of anchorage items in concrete. Check embedded items for correctness of location and detail before concrete is placed.
- K. Control erection tolerance requirements to not impair the strength, safety, serviceability, or appearance of installations, as accepted by the Project Representative. Determine exact location of conduit. Route all conduit parallel to building lines.
- L. Hot-dip galvanize all exterior support hardware after fabrication.
- M. Install individual conductors in conduits, raceways, ducts, and trenches to complete the wiring systems.
- N. Install outlets and cover plates complete in a neat manner in accordance with the NEC and local codes.

3.03 WIRE AND CABLE

- A. Branch circuits shall be #12 AWG minimum.
- B. Branch circuit wiring size #10 AWG and smaller shall have continuous color code identification per standard listed below. Tin all stripped ends of wiring #10 AWG and smaller prior to termination under set screws.
- C. Use no mechanical means for pulling wires, and no lubricant except powdered soapstone or accepted substitute.
- D. Branch circuit splices may be made with 3M Scotch-Lok Electrical Spring type connectors up to #8 AWG size, except motor connections.
- E. Utilize crimp-type pressure connectors insulated with tape or pre-fabricated covers on motor connections and splices of wiring #6 AWG and larger.
- F. Make no splices in home runs.

G. Do not inter-mix wiring from separate raceway systems unless specifically permitted by the Project Representative.

H. Color Coding Standards:

3Ø, 4 Wire System:	208Y/120V	480Y/277V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

Control Wiring: Grey or black with identifying wire numbers at each termination

Color-coded Tape: May be used in lieu of color-coded insulation for conductors #8 AWG and larger. However, the insulation shall be black only and shall be tape-identified with color scheme shown above at splices, terminations and junction boxes.

- I. Each single pole branch circuit shall contain a dedicated neutral conductor and equipment grounding conductor of the same size as the hot conductors. Shared neutral conductors and/or multi-pole breakers used on single pole loads are not permitted.
- J. All wiring shall be identified with permanent wire labels, using alphanumeric designations. All terminations and splices shall be identically labeled for the same wire (i.e. common conductors terminated in multiple locations). Wire labels shall agree with the circuit designations on the as-built drawings. Provide Thomas and Betts, Brady, or equal, printed plastic adhesive tapes to show circuit numbers. Wrap tapes at least two turns around conductor.
- K. All conductors of a circuit, including the neutral and equipment grounding conductors must be installed together in the same raceway, cable, trench, cord, or cable tray, except as permitted by **NEC Section 300.3 (B) (1) through (4)**
- L. Identify conductors in outlets, pull boxes, and similar locations where conductors are accessible.
- M. Conductors in panels, cabinets, and enclosures: Provide neat and workmanlike installation with conductors tied with T&B Ty-Rap, or equal, nylon wire ties. Provide adhesive back nylon Ty-Rap 4-way bases (#TC200X200AX or equal) to group conductors in neat and orderly manner.

- N. Low voltage wiring and cables specified herein by Divisions 26 or 28 shall be installed either in complete raceway system or shall be plenum rated.

3.04 WIRING DEVICES

- A. Installation: Install two or more wiring devices shown in one location under a common plate. Install plates with edges in continuous contact with finished wall surfaces. Do not install more than one device in single-gang position.
- B. Device Locations: Device or equipment mounting height given herein the Specifications, Contract Drawings, and/or documents are intended to provide general guidelines. Provide pre rough-in coordination and verification with other divisions. Verify that the intended mounting heights are appropriate for the intended device use, and the device location is not in conflict with other components.
- C. Prior to rough-in, devices and equipment locations may be revised by the Owner's Representative within 20' of the designed contract location, at no cost. Prior to rough-in, confirm locations with Owner for devices they may wish to have relocated from the location indicated on the contract drawings.
- D. If the contractor fails to provide such coordination and field verification and results of erroneous installation, the contractor shall remedy such installation per Owner Representative's direction, at contractor's cost.
- E. Provide GFCI protection for receptacles requiring GFCI protection per **NEC Article 511**.
- F. Mount wiring devices above finished floor to centerline of device as follows, unless noted otherwise or as directed by Owner's Representative. Coordinate with Owner's Representative for possible interference with decorative features, art displays, etc.

Switches	42-inches
Receptacles, Telecom Outlets	18-inches
Receptacles Above Counter	6-inches to CL above backsplash or as directed
Fire Alarm Pull Stations, Wall Phones	42-inches
Fire Alarm Audio Visual Devices	80-inches (or 6" below ceiling), whichever is lower
Receptacles (in Classified Areas)	24-inches (above finished floor and below ceiling)

3.05 BOXES

- A. Support boxes securely and independently.
- B. Mount boxes on building surfaces or support with trapeze hanger.
- C. Do not use junction boxes unless the number of bends, pulling length or circuit requirement necessitates their installation.
- D. Junction or pull box openings must be accessible.
- E. Do not use extension rings to provide Code size space within a new junction box. Provide larger junction boxes as required in lieu of extension rings.
- F. Do not intermix raceways and wiring at common junction boxes except at terminal equipment connections.

3.06 GROUNDING

- A. General: Provide system and equipment grounding in accordance with the applicable codes and ordinances and as further amplified on the Drawings.
- B. Ground service equipment, separately derived systems, conduits, devices and equipment in accordance with **NEC, Article 250**.
- C. Grounding Conductor: Provide green insulated equipment grounding conductor in conduits containing wiring systems above 50 volts. Insulation and conductor type shall be the same for circuit or feeder conductors. Size conductors in accordance with **NEC Article 250**.

- D. Bonding: All conduit systems shall be effectively grounded and bonded together by accepted bonding means in accordance with the NEC. Verify ground continuity between conduits, boxes, receptacles, and equipment.
- E. Inspection: Place no backfill around grounding system until it has been inspected by the Electrical Inspector, and Project Representative.

END OF SECTION

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SECTION 26 05 02 MINOR ELECTRICAL DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical demolition.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation.
- D. Report discrepancies to Owner's Representative and Owner before disturbing existing installation.
- E. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings for buildings to be demolished. Coordinate with Owner and per Contract Documents for equipment to be disconnected and retained for Owner's use.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.

1. Make temporary connections to maintain service in areas adjacent to work area.

3.03 TEMPORARY ELECTRICAL POWER

- A. Temporary Electrical Power shall comply with **Section 01 50 00 - Temporary Facilities and Control**.
- B. Continuity of Service: Provide temporary service to existing systems as required to maintain continuous operation without reducing equipment efficiency. Coordinate the extent of temporary services with the Project Representative.
- C. Power Outages: Outages shall be kept to an absolute minimum and shall only be allowed during connection/disconnection of temporary power. Any essential outages required in the course of construction, whether for temporary services, cutovers, or testing, shall be closely coordinated with the Project Representative and shall only occur at pre-scheduled times accepted by the Owner. Outages shall be scheduled for weekends, holidays, or after hours if the outages will affect the use of occupied buildings or surrounding buildings. The actual time and dates shall be coordinated with, and accepted by the Owner at least 2-weeks in advance and 48 hours prior to shut down.
- D. Contractor shall provide temporary power throughout Construction Sequences such that no building is without power during occupied periods of time. Coordinate sequences and scheduling with the Owner Representative.
- E. Contractor shall be responsible to ensure the Owner's facilities are operational during construction sequences. Coordinate all temporary outages at least 72 hours in advance with Project Representative.
- F. Costs: Pay all costs associated with temporary power and utility shutdowns. No additional payment will be made for overtime work, schedule changes, or failure to complete temporary connections and/or permanent service connections within authorized shutdown periods.

3.04 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Identify circuit source of supply to outlets and equipment effected by demolition.
- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

- E. Maintain continuity to existing outlets and equipment scheduled to remain.
Provide additional raceway, boxes and wire required to restore existing circuitry.
- F. Disconnect and remove abandoned panelboards and distribution equipment.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Repair adjacent construction and finishes damaged during demolition and extension work. Restore finishes to same quality before demolition work commenced.
- I. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- J. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.05 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment that remain or that are to be reused.

END OF SECTION

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SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, Division 26 and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that apply to work under this Specification.

1.02 SUMMARY

- A. Service entrance cable.
- B. Underground feeder and branch-circuit cable.
- C. Single conductor building wire.
- D. Wire and cables for 600 Volts and less.
- E. Wiring connectors.

1.03 REFERENCES

- A. ASTM B 3 – Standard Specification for Soft or Annealed Copper Wire; 2001 (R2007).
- B. ASTM B 8 – Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2004.
- C. ASTM 787/B 787M – Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (R2009).
- D. NECA 1 – Standard for Good Workmanship in Electrical Contracting; National Electrical Contractor's Association; 2006.
- E. NEMA WC 70 – Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; National Electrical Manufacturers Association; 2009. (ANSI/NEMA WC 70/ICEA S-95-658).
- F. NETA STD ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.

- G. NFPA 70 – National Fire Protection Agency; National Electrical Code (NEC); Most Recent Edition Adopted by Authority Having Jurisdiction, Including all Applicable Amendments and Supplements.
- H. UL 44 – Thermoset-Insulated Wires and Cables; Current Edition, Including all Revisions.
- I. UL 83 – Thermoplastic-Insulated Wires and Cables; Current Edition, Including all Revisions.
- J. UL 486A-486B – Wire Connectors; Current Edition, Including all Revisions.
- K. UL 486C – Splicing Wire Connectors; Current Edition, Including all Revisions.
- L. UL 486D – Sealed Wire Connector Systems; Current Edition, Including all Revisions.
- M. UL 854 – Service-Entrance Cables; Current Edition, Including all Revisions.
- N. Institute of Electrical and Electronics Engineers (IEEE).

1.04 WIRING METHODS

- A. Wiring systems 50V and greater shall be installed in a complete raceway system.
- B. Wiring systems less than 50V: Unless noted otherwise in other sections of these documents, may be installed as open wiring in accessible spaces, subject to the following conditions:
 - 1. Install wiring in conduit in non-accessible spaces and outdoors.
 - 2. Open wiring shall be plenum-rated.
 - 3. Provide outlet boxes for low-voltage wiring devices and splices.

1.05 SUBMITTALS

- A. Submit catalog cuts for all items proposed to be furnished and installed under this Section.
- B. Provide complete submittal information. Accepted documents shall include, but not be limited to, factory shop drawings, details, and wiring diagrams.
- C. Project Record Documents: Record actual locations of components and circuits.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.
- B. Furnish products listed by Underwriters Laboratories (UL).

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wire and Cable:
 - 1. Cerro Wire LLC.
 - 2. Southwire.
 - 3. Cablec Continental Cable Company.
 - 4. General Cable Corporation.
 - 5. Okonite Company.
- B. Splice Connectors:
 - 1. Burndy.
 - 2. Ideal Industries.
 - 3. Ilsco.
 - 4. 3-M.
 - 5. Thomas & Betts.
- C. Terminal Lugs:
 - 1. Ilsco.
 - 2. Burndy.
 - 3. Anderson.
 - 4. Thomas & Betts.

2.02 WIRING REQUIREMENTS

- A. Branch Circuits:
 - 1. Provide separate grounded circuit conductor (neutral) for each ungrounded circuit conductor. Shared neutral not permitted for multi-wire branch circuits.
 - 2. Provide separate equipment grounding conductor for each branch circuit. Shared equipment grounding not permitted for multiple branch circuits.
- B. Exterior or Interior Wet Locations: Use only building wire with Type THHW-2 Copper insulation in raceway.

2.03 ALL CONDUCTORS AND CABLES

- A. Provide products that comply with requirements of **NFPA 70**.
- B. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose indicated.
- C. Provide new conductors and cables manufactured not more than one year prior to installation.
- D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

- E. Comply with NEMA WC 70.
- F. Thermoplastic-Insulated Conductors: Listed and labeled as complying with UL 83.
- G. Thermoset-Insulated Conductors: Listed and labeled as complying with UL 44.
- H. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with **ASTM B 3, ASTM B 8, or ASTM B 787/B 787M** unless otherwise indicated.
- I. Conductor Color Coding:
 - 1. Color code conductors as indicated or otherwise required by Authority Having Jurisdiction. Maintain consistent color coding throughout the Project.
 - 2. Color Coding Method: Integrally colored insulation.
 - 3. Color Code: Refer to **Section 26 05 53 - Identification for Electrical Systems**.

2.04 SINGLE CONDUCTOR BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Conductor Stranding:
 - 1. Feeders and Branch Circuits:
 - a. Size 10 AWG and Smaller: Solid.
 - b. Size 8 AWG and Larger: Stranded.
 - 2. Control Circuits: Stranded.
- C. Insulation Voltage Rating: 600 Volts.
- D. Insulation:
 - 1. Copper Building Wire: Type THWN-2, except as indicated below:
 - a. Size 4 AWG and Larger: Type XHHW-2.
 - b. Installed Underground: Type XHHW-2.
 - c. Service Entrance Conductors: Type XHHW-2.
- E. Conductor Material: Copper.
- F. Additional Requirements:
 - 1. Insulation: **NFPA 70**, Type THWN-2, 90 degree C.
 - 2. Solid conductor for feeders and branch circuits #10 AWG and smaller.
 - 3. Stranded conductors for feeders and branch circuits #8 AWG and larger.
 - 4. Stranded conductors for control circuits.
 - 5. Minimum size conductor #12 AWG for power and lighting circuits.
 - 6. Minimum size conductor #16 AWG for control circuits.

7. #10 AWG conductors for 20 ampere, 120 V branch circuits longer than 75 feet. Refer to NFPA 70 Voltage Drop Calculations.
8. #10 AWG conductors for 20 ampere, 277 V branch circuits longer than 200 feet. Refer to NFPA 70 Voltage Drop Calculations.

2.05 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Wiring Connectors for Splices and Taps:
 1. Copper Conductors Size #8 AWG and Smaller: Use twist-on insulated spring connectors.
 2. Copper Conductors Size #6 AWG and Larger: Use mechanical connectors or compression connectors.
- C. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
- D. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F (105 degrees C) for standard applications and 302 degrees F (150 degrees C) for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
- E. Mechanical Connectors: Provide bolted type or set-screw type.
- F. Compression Connectors: Provide circumferential type or hex type crimp configuration.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with **NFPA 70**.
- D. Verify that raceway installation is complete and supported.
- E. Verify that field measurements are as shown on the drawings.
- F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install conductors and cables in a neat and workmanlike manner in accordance with **NECA**.
- C. Installation in Raceway:
 - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 - 2. Pull all conductors and cables together into raceway at same time.
 - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- D. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- E. Secure and support conductors and cables in accordance with **NFPA 70** using suitable supports and methods accepted by the Authority Having Jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
- F. Install conductors with a minimum of 6 inches of slack at each outlet.
- G. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- H. Make wiring connections using specified wiring connectors.
 - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 - 3. Do not remove conductor strands to facilitate insertion into connector.
 - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
 - 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

- I. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
- J. Insulate ends of spare conductors using vinyl insulating electrical tape.
- K. Identify and color code wire and cable under provisions of **Section 26 05 53 - Identification for Electrical Systems**. Identify each conductor with its circuit number or other designation indicated.
- L. Color Code Legend: Provide identification label identifying color code for ungrounded conductors at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
- M. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.
- N. Open cables shall be installed in a neat and workmanship like manner, parallel or perpendicular to building lines and supported at intervals not greater than 5'.
- O. Route wire and cable as required to meet project conditions. Use wiring methods required and pull all conductors into raceway at same time.
- P. Use suitable wire pulling lubricant for building wire #4 AWG and larger.
- Q. Clean conductor surfaces before installing lugs and connectors.
- R. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- S. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, #8 AWG and smaller.
- T. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, #10 AWG and smaller.
- U. Use Vinyl Mastic Pads and Rolls for splices in wet locations.
- V. Branch Circuit Installation:
 - 1. Continuous color code insulation throughout.
 - 2. Make no splices in wiring from distribution equipment to first outlet.
 - 3. Do not inter mix wiring from separate electrical systems unless specifically indicated.
- W. Feeder Installation:
 - 1. Size feeders as shown on Drawings.

2. Identify according to color code standards.
3. Make no splices unless shown on the Drawings or specifically accepted by the Owner's representative.
4. Splices shall be compression sleeve type.

3.04 INSPECTION AND TESTS

- A. General: The electrical installation shall be inspected and tested to ensure conformity to Code, authorities having jurisdiction, and contract documents. Field tests shall be performed in conformance with the **National Electrical Testing Association (NETA) Standards**. Tests shall be performed by an authorized testing agency that is independent from the installing electrical contractor. The electrical contractor shall hire and pay for the independent authorized testing agency.
- B. Measure and record insulation resistance of all wiring installed by or altered by the contractor including insulation resistance of all equipment. The Electrical Contractor shall not be responsible for defective insulation in equipment that is existing or has been supplied by other divisions of the specifications, unless such damage is due to negligence or incorrect handling or installation workmanship of this Contractor.
 1. The insulation resistance of each circuit phase-to-phase and phase-to-ground shall be measured. For circuits rated less than 600 volts, the resistance shall not be less than one megohm.
 2. Systems rated above 240 volts shall be tested with a 500-volt Megohmmeter. Circuits rated 240 volts and below shall be tested with a 500-volt Megohmmeter. The D.C. potential shall be applied for thirty (30) seconds.
- C. The Contractor shall record test readings and submit certified test reports in the record operation and maintenance manuals for Owner's records. Any equipment or cable to fail the above tests shall be repaired or replaced as required to pass the above testing criteria.

END OF SECTION

SECTION 26 05 23 CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, and Division 26.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that apply to work under this Specification.

1.02 SUMMARY

- A. Section Includes:
 - 1. Category 6 balanced twisted pair cable.
 - 2. Balanced twisted pair cabling hardware.
 - 3. Low-voltage control cabling.
 - 4. Control-circuit conductors.
 - 5. Identification products.

1.03 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.
- C. Plenum: A space forming part of the air distribution system to which one or more air ducts are connected. An air duct is a passageway, other than a plenum, for transporting air to or from heating, ventilating, or air-conditioned equipment.
- D. RCDD: Registered Communications Distribution Designer.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.05 INFORMATION SUBMITTALS

- A. Qualification Data: For testing agency, RCDD, layout technician, installation supervisor, and field inspector.
- B. Source quality-control reports.
- C. Field quality-control reports.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.
- B. Testing Agency Qualifications: Accredited by **NETA**.
 - 1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.
- B. Flame Travel and Smoke Density in Plenums: As determined by testing identical products according to **NFPA 262**, by a qualified testing agency. Identify projects for installation in plenums with appropriate markings of applicable testing agency.
 - 1. Flame Travel Distance: 60-inches or less.
 - 2. Peak Optical Smoke Density: 0.5 or less.
 - 3. Average Optical Smoke Density: 0.15 or less.
- C. Flame Travel and Smoke Density for Riser Cables in Non-Plenum Building Spaces: As determined by testing identical products according to UL 1666.
- D. Flame Travel and Smoke Density for Cables in Non-Riser Applications and Non-Plenum Building Spaces: As determined by testing identical products according to UL 1685.
- E. RoHS Compliant.

2.02 CATEGORY 6 BALANCED TWISTED PAIR CABLE

- A. Description: Four-pair, balanced twisted pair cable, certified to meet transmission characteristics of Category 6 cable at frequencies up to 250 MHz.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Mowhawk
 - 2. AMP NETCONNECT; a TE Connectivity Ltd. Company.
 - 3. Berk-Tek Leviton; a Nexans/Leviton alliance.
 - 4. CommScope, Inc.
 - 5. Belden Inc.
- C. Standard: Comply with NEMA WC 66/ICEA S-116-732 and TIA-568-C.2 for Category 6 cables.

- D. Conductors: 100-ohm, 23 AWG solid copper.
 - 1. Lead Content: Less than 300 parts per million.
- E. Shielding/Screening: Shielded twisted pairs (FTP).
- F. Cable Rating: Plenum.
- G. Jacket: Blue.

2.03 BALANCED TWISTED PAIR CABLE HARDWARE

- A. Description: Hardware designed to connect, splice, and terminate balanced twisted pair copper communications cable.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AMP NETCONNECT; a TE Connectivity Ltd. Company.
 - 2. Berk-Tek Leviton; a Nexans/Leviton alliance.
 - 3. CommScope, Inc.
 - 4. Belden Inc.
- C. General requirements for Balanced Twisted Pair Cable Hardware:
 - 1. Comply with the performance requirements of Category 6.
 - 2. Comply with TIA-568-C.2, IDC type, with modules designed for punch down caps or tools.
 - 3. Cables shall be terminated with connecting hardware of same category or higher.
- D. Source Limitations: Obtain balanced twisted pair cable hardware from same manufacturer as balanced twisted pair cable, from single source.
- E. Patch Cords: Factory-made, four-pair cables in 36-inch lengths; terminated with an eight-position modular plug at each end.
 - 1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure performance.
 - 2. Patch cords shall have latch guards to protect against snagging.
 - 3. Patch cords shall have color-coded boots for circuit identification.
- F. Plugs and Plug Assemblies:
 - 1. Male; eight position; color-coded modular telecommunications connector designed for termination of a single four-pair 100-ohm unshielded balanced twisted pair cable.
 - 2. Comply with **IEC 60603-7-1, IEC 60603-7-2, IEC 60603-7-3, IEC 60603-7-4, and IEC 60603-7-5.**
 - 3. Marked to indicate transmission performance.

G. Jacks and Jack Assemblies:

1. Female, eight position; modular; fixed telecommunications connector designed for termination of a single four-pair 100-ohm unshielded or shielded balanced twisted pair cable.
2. Designed to snap-in to a patch panel or faceplate.
3. Standards:
 - a. Category 6, unshielded balanced twisted pair cable shall comply with **IEC 60603-7-4**.
4. Marked to indicate transmission performance.

H. Faceplate:

1. Two, four, or six port, vertical single-gang faceplates designed to mount to single-gang wall boxes.
2. Eight, ten, twelve port, vertical double-gang faceplates designed to mount to double-gang wall boxes.
3. Plastic Faceplate: High-impact plastic. Coordinate color with **Section 26 27 26 - Wiring Devices**. Default color shall be white, unless otherwise indicated.
4. Metal Faceplates: Stainless steel, complying with requirements in **Section 26 27 26 - Wiring Devices**.
5. For use with snap-in jacks accommodating any combination of balanced twisted pair, optical fiber, and coaxial work area cords.
 - a. Flush mounting jacks, positioning the cord at a 45-degree angle.

I. Legend:

1. Machine printed, in the field, using adhesive-tape label.
2. Snap-in, clear-label covers and machine printed paper inserts.

2.04 LOW-VOLTAGE CONTROL CABLE

A. Paired Cable: **NFPA 70**, Type CMG.

1. One pair, twisted, No. 16 AWG, stranded (19x29) tinned-copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with **UL 1685**.
6. Lead Content: Less than 300 parts per million.

B. Plenum-Rated, Paired Cable: **NFPA 70**, Type CMP.

1. One pair, twisted, No. 16 AWG, stranded (19x29) tinned-copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with **NFPA 262**.
6. Lead Content: Less than 300 parts per million.

2.05 CONTROL-CIRCUIT CONDUCTORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Service Wire Co. or a comparable product by one of the following:
 - 1. Encore Wire Corporation.
 - 2. General Cable; General Cable Corporation.
 - 3. Southwire Company.
- B. Class 1 Control Circuits: Stranded copper, Type THHN/THWN-2, complying with UL 83 in raceway.
- C. Class 2 Control Circuits: Stranded copper, Type THHN/THWN-2, complying with UL 83 in raceway.

2.06 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate cables.
- B. Factory test twisted pair cables according to TIA-568-C.2.
- C. Cable will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Test cables on receipt at Project Site.
 - 1. Test each pair of twisted pair cable for open and short circuits.

3.02 INSTALLATION OF RACEWAYS AND BOXES

- A. Comply with requirements in **Section 26 05 33 - Raceways and Boxes for Electrical Systems** for raceway selection and installation requirements for boxes, conduits, and wireways as supplemented or modified in this Section.
 - 1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high and 2-1/2 inches deep.
 - 2. Outlet boxes for cables shall be no smaller than 4 inches square by 2-1/8 inches deep with extension ring sized to bring edge of ring to within 1/8 inch of the finished wall surface.
- B. Comply with TIA-569-D for pullbox sizing and length of conduit and number of bends between pull points.
- C. Install manufactured conduit sweeps and long-radius elbows where possible.

3.03 INSTALLATION OF CONDUCTORS AND CABLES

A. Comply with **NECA 1**.

B. General Requirements for Cabling:

1. Comply with TIA-568-C Series of Standards.
2. Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems".
3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
4. Cables may not be spliced and shall be continuous from terminal to terminal. Do not splice cable between termination, tap, or junction points.
5. Cables serving a common system may be grouped in a common raceway. Install network cabling and control wiring and cable in separate raceway from power wiring. Do not group conductors from different systems or different voltages.
6. Secure and support cables at intervals not exceeding 30-inches and not more than 6-inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in **BICSI ITSIMM**, Ch. 5, "Copper Structured Cabling Systems". Install lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Do not use heat lamps for heating.
10. Pulling Cable: Comply with **BICSI ITSIMM**, Ch. 5, "Copper Structured Cabling Systems". Monitor cable pull tensions.
11. Secure: Fasten securely in place with hardware specifically designed and installed so as to not damage cables.
12. Provide strain relief.
13. Keep runs short. Allow extra length for connecting to terminals. Do not bend cables in a radius less than 10-times the cable outside diameter (OD). Use sleeves or grommets to protect cables from vibration at points where they pass around sharp corners and through penetrations.
14. Ground wire shall be copper, and grounding methods shall comply with **IEEE C2**. Demonstrate ground resistance.

C. Balanced Twisted Pair Cable Installation:

1. Comply with **TIA-568-C.2**.
2. Do not untwist balanced twisted pair cables more than 1/2 inch at the point of termination to maintain cable geometry.

D. Installation of Control-Circuit Conductors:

1. Install wiring in raceways.

2. Use insulated spade lugs for wire and cable connection to screw terminals.
3. Comply with requirements specified in **Section 26 05 33 - Raceways and Boxes for Electrical Systems**.

3.04 REMOVAL OF CONDUCTORS AND CABLES

- A. Remove abandoned conductors and cables. Abandoned conductors and cables are those installed that are not terminated at equipment and are not identified with a tag for future use.

3.05 CONTROL-CIRCUIT CONDUCTORS

- A. Minimum Conductor Sizes.
 1. Class 1 remote-control and signal circuits; No. 14 AWG.
 2. Class 2 low-energy, remote-control, and signal circuits; No. 16 AWG.
 3. Class 3 low-energy, remote-control, alarm, and signal circuits; No. 12 AWG.

3.06 FIRESTOPPING

- A. Comply with **TIA-569-D**; Annex A, "Firestopping".
- B. Comply with **BICSI TDMM**; "Firestopping" Chapter.

3.07 GROUNDING

- A. For data communication wiring, comply with **TIA-607-B** and with **BICSI TDMM**, "Bonding and Grounding (Earthing)" Chapter.
- B. For low-voltage control wiring and cabling, comply with requirements in **Section 26 05 26 - Grounding and Bonding for Electrical Systems**.

3.08 IDENTIFICATION

- A. Comply with requirements for identification specified in **Section 26 05 53 - Identification for Electrical Systems**.
- B. Identify data and communications system components, wiring, and cabling according to **TIA-606-B**; label printers shall use label stocks, laminating adhesives, and inks complying with **UL 969**.
- C. Identify each wire on each end and at each terminal with a number-coded identification tag. Each wire shall have a unique tag.

3.09 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

- B. Perform tests and inspections with the assistance of a factory-authorized service representative.
- C. Tests and Inspections:
 - 1. Visually inspect cable jacket materials for UL or third-party certification markings. Inspect cabling terminations to confirm color-coding for pin assignments, and inspect cabling connections to confirm compliance with **TIA-568-C-1**.
 - 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 - 3. Test cabling for direct-current loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination, but not after cross-connection.
 - a. Test instruments shall meet or exceed applicable requirements in **TIA-568-C.2**. Perform tests with a tester that complies with performance requirements in its "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in its "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
- D. Document data for each measurement. Print data for submittals in a summary report that is formatted using Table 10.1 in **BICSI TDMM** as a guide or transfer the data from the instrument to the computer, save as text files, print, and submit. Submit the testing documentation to the project engineer and City of Tacoma.
- E. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

END OF SECTION

SECTION 26 05 26 GROUNDING AND BONDING

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, Division 26, and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that applies to work under this Specification.

1.02 SUMMARY

- A. Provide a complete grounding system that complies with the current edition of the National Electrical Code (NEC), and all applicable regulatory codes.
- B. Provide all components necessary to complete the grounding system(s) consisting of:
 - 1. Metal underground water pipes.
 - 2. Metal frame of buildings.
 - 3. Rod electrodes.
 - 4. Building ground rings.
 - 5. Ground bars.
 - 6. Additional grounding and bonding components required.
 - 7. Ground rod access (test) wells.
- C. Performance Requirements: Maximum 5-ohms grounding system resistance.

1.03 REFERENCES

- A. NFPA 70 – National Electrical Code (NEC); National Fire Protection Association; Most recent edition adopted by the Authority Having Jurisdiction, including all applicable amendments and supplements.

1.04 SUBMITTALS

- A. Product Data: Provide manufacturers catalog cuts for grounding electrodes, conductors, and connections.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience with service facilities within 100 miles of the Project.

- C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cooper Power Systems.
- B. Storm Copper Components Co.
- C. Harger.
- D. Or other reviewed and accepted Manufacturers.

2.02 GROUND RODS

- A. Minimum size: 5/8" diameter by 8'-0" long, copper clad steel rods.

2.03 GROUND ROD TEST WELLS

- A. Minimum size: 12" diameter by 24" long, schedule 40 PVC with belled hub.
- B. Cover type: Flat steel with identification nameplate "GROUND TEST WELL".

2.04 GROUND BARS

- A. Copper bar with pre-punched holes.
- B. UL recognized standoff insulators for wall mounting.
- C. Stainless steel mounting brackets, stainless steel assembly bolts and lock washers.
- D. Suitable for indoor and outdoor installations.
- E. Size as required.

2.05 GROUND CONDUCTORS

- A. Grounding conductors shall be soft drawn, bare, stranded copper unless otherwise noted. Size as shown on the plans and per **NEC, Article 250**.
 - 1. Grounding Electro Conductors for AC Systems:
 - a. See **NEC Table 250.66**.
 - 2. Equipment Grounding Conductors:
 - a. See **NEC Table 250.122**.
 - b. Equipment grounding conductors may be insulated; provide green insulation and/or accepted permanent identification for conductors larger than #6 AWG.

2.06 GROUND ELECTRODE CONNECTORS

- A. Connectors for grounding electrode conductor to ground rod shall be of thermal fusion type; conductor-to-conductor connections may be either thermal fusion or accepted hydraulically applied compression type.

2.07 GROUNDING BUSHINGS

- A. Grounding bushings shall be matched to the ampacity of the grounding conductor and shall have accepted set-screw type grounding lug connectors.

2.08 GROUNDING CONNECTORS

- A. Shall meet the requirements of ground bushings, cast, set-screw, or bolted type.
- B. Clamps shall be matched to the ampacity of the grounding conductor. Provide accepted raceway hub where grounding conductor is shown protected by conduit or armored cable. Clamps shall be U-bolt type for connection to water pipes.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.
- B. Verify that final backfill and compaction has been completed before driving rod electrodes.
- C. Prior to making mechanical or thermal connections, all conductors shall be clean, dry and bright with the bonding surface thoroughly cleaned of any oxides, mill, scale, or other foreign matter.

3.02 INSTALLATION

- A. Provide system and equipment grounding in accordance with the applicable codes and ordinances and as indicated on the Plans.
- B. Ground service equipment, separately derived systems, conduits, devices, and equipment in accordance with **NEC, Article 250**.
- C. Grounding Conductor: Provide green insulated equipment grounding conductor in conduits containing wiring systems above 50V. Insulation and conductor type shall be the same for circuit or feeder conductors. Size conductors in accordance with **NEC Article 250**.
- D. Inspection: Place no backfill around made electrode earth grounding systems until the installation is inspected and accepted by the Owner's Representative and Electrical Inspector.

- E. Bonding: Conduit systems shall be effectively grounded and bonded together by accepted bonding means in accordance with the **NEC**. Verify ground continuity between conduits, boxes, receptacles, and equipment.
- F. Install ground electrodes at locations indicated on Plans or required by **NEC**.
 - 1. Unless otherwise indicated, top of electrode shall be 6" below finished surface.
 - 2. Bury electrode conductors below finished surface.
- G. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing. Bond steel together.
- H. Provide bonding to meet requirements described in Part 1 of this Specification.

3.03 GROUND CONTINUITY

- A. Maintain ground continuity throughout the entire electrical system.
- B. Permanently connect the electrical system neutral to the water service. The system shall be grounded only at transformer secondaries and at the main switchboard. Branch panel neutrals must be isolated from additional points of grounding.
- C. Provide accepted grounding bushings or locknuts on all conduits terminating in panelboards, pullboxes, or other enclosures to insure continuity of conduit grounding connections.
- D. Securely ground lighting fixtures via the conduit system or by a separate suitable grounding conductor where flexible conduit is used.
- E. Provide a separate grounding conductor in all non-metallic conduits and in all flexible metallic conduit runs. Connect to the grounding system in an accepted manner.
- F. Cable trays used as equipment grounding conductors shall be specifically accepted for that purpose. Special bolted mechanical connectors and/or bonding jumpers shall be utilized to ensure system ground continuity.
- G. All plug-in receptacles shall be bonded to the box and raceway ground system unless specific isolated ground connections are shown on the Drawings.

3.04 GROUND CONNECTIONS

- A. All grounding connections shall be carefully made to insure low system impedance. Locate grounding connections to allow future servicing and expansion.

3.05 PROTECTION

- A. Ground conductors shall be protected from mechanical injury during construction. Provide protective coverings or rigid non-ferrous conduit.

3.06 GROUND RODS

- A. Ground rods shall be driven into undisturbed soil to full depth. Provide additional rods, ionic salt solutions and the like where special low-resistant grounds are specified.

3.07 THROUGH-SLAB GROUND PENETRATIONS

- A. Ground conductors extending through the slab shall be protected by a rigid conduit sleeve; the void portion of the sleeve shall be packed with a non-hardening type duct seal.

3.08 TESTING

- A. Measure the Ohmic value of the electrical service entrance metallic "Electrical System Ground" with reference to "Earth Ground" using the "Multiple Ground Rods" method and suitable instruments. Maximum resistance to ground shall be less than 5 ohms. If this resistance cannot be obtained, notify the Owner's Representative in writing.
- B. Provide a paper copy of the test results and in the record O&M Manuals.

END OF SECTION

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SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, Division 26, and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that apply to work under this Specification.

1.02 SUMMARY

- A. Section Includes:
 - 1. Steel slotted support systems.
 - 2. Aluminum slotted support systems.
 - 3. Nonmetallic slotted support systems.
 - 4. Conduit and cable support devices.
 - 5. Support for conductors in vertical conduit.
 - 6. Structural steel for fabricated supports and restraints.
 - 7. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
 - 8. Fabricated metal equipment support assemblies.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Slotted support systems, hardware, and accessories.
 - b. Clamps.
 - c. Hangers.
 - d. Sockets.
 - e. Eye nuts.
 - f. Fasteners.
 - g. Anchors.
 - h. Saddles.
 - i. Brackets.
 - 2. Include rated capacities and furnished specialties and accessories.
- B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.
 - 1. Hangers. Include product data for components.
 - 2. Slotted support systems.
 - 3. Equipment supports.

1.04 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. **AWS D1.1/D1.1M.**
2. **AWS D1.2/D1.2M.**

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in **Section 01 73 24 - Design Requirements for Non-Structural Components and Non-Building Structures**, to design hanger and support system.
- B. Seismic Performance for Electrical Component Supports located within structures falling under seismic design categories C, D, E, and F: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7, see **Section 01 73 24 - Design Requirements for Non-Structural Components and Non-Building Structures**.
1. The term “withstand” means “the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified and the supported equipment and systems will be fully operational after the seismic event”.
- C. Surface-Burning Characteristics: Comply with **ASTM E 84**; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame Rating: Class 1.
 2. Self-extinguishing according to **ASTM D 635**.

2.02 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch diameter holes at maximum of 8 inches o.c. in at least one surface.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Gripple, Inc., pipe support and hanging systems, or comparable products by one of the following:
 - a. Allied Tube & Conduit; a part of Atkore International.
 - b. B-line, an Eaton business.
 - c. ERICO International Corporation.
 - d. Flex-Strut Inc.
 - e. GS Metals Corp.
 - f. G-Strut.
 - g. Haydon Corporation.
 - h. Metal Ties Innovation.

- i. Thomas & Betts Corporation; A Member of the ABB Group.
 - j. Unistrut; Part of Atkore International
 - k. Wesanco, Inc.
 2. Pipe Bracket Kit Description: Pipe Bracket (PB1FT / PB2FT / PB3FT / PB4FT) and Universal (GC2-T) clamps or Compact (GC2-C) clamps. Manually assembled in the field to support multiple parallel pipes.
 3. Approvals: **ISO 17025, MSS-SP 58, IAPMO/ANSI UPC 1-2012, UL 2239, and UL 2043.**
 4. Material for Channel: Pregalvanized steel G90 (Z275).
 5. Channel Width: Selected for applicable load criteria. Default is 1-3/4 inches.
 6. Painted Coatings: Manufacturer's standard painted coating applied according to **MFMA-4**.
 7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Aluminum Slotted Support Systems: Extruded-aluminum channels and angles with minimum 13/32-inch diameter holes at a maximum of 8 inches o.c. in at least one surface.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cooper Industries, Inc.
 - b. Flex-Strut Inc.
 - c. Haydon Corporation
 - d. MKT Metal Manufacturing
 - e. Thomas & Betts Corporation; A Member of the ABB Group.
 - f. Unistrut; Part of Atkore International.
 2. Standard: Comply with **MFMA-4** factory-fabricated components for field assembly.
 3. Channel Material: 6063-T5 aluminum alloy.
 4. Fittings and Accessories Material: 5052-H32 aluminum alloy.
 5. Channel Width: selected for applicable load criteria. Defaults are: 1-5/8 inches or 1-1/4 inches.
 6. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to **MFMA-4**.
 7. Painted Coatings: Manufacturer's standard painted coating applied according to **MFMA-4**.
 8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with minimum 13/32-inch diameter holes at a maximum of 8 inches o.c., in at least one surface.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit; a part of Atkore International.
 - b. B-line, an Eaton Business.
 - c. Fabco Plastics Wholesale Limited.

- d. G-Strut.
 - e. Haydon Corporation.
 - f. Seasafe, Inc.; AMICO, a Gibraltar Industries Company.
 - 2. Standard: Comply with **MFMA-4** factory-fabricated components for field assembly.
 - 3. Channel Width: Selected for applicable load criteria. Defaults are: 1-5/8 inches or 1-1/4 inches.
 - 4. Fittings and Accessories: Products provided by channel and angle manufacturer and designed for use with those items.
 - 5. Fitting and Accessory Materials: Same as those for the channels and angles, except metal items may be stainless steel.
 - 6. Rated Strength: Selected to suit applicable load criteria.
 - 7. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Conduit and Cable Support Devices: Steel and malleable iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Gripple, Inc.; adjustable clamp and pipe bracket system for suspension of conduits 4-inch and smaller, or comparable products by one of the following:
 - a. Allied Tube & Conduit; a part of Atkore International.
 - b. B-line, an Eaton Business.
 - c. Fabco Plastics Wholesale Limited.
 - d. G-Strut.
 - e. Haydon Corporation.
 - f. Seasafe, Inc.; AMICO, a Gibraltar Industries Company.
 - 2. Wire Rope Type 1: High tensile steel wire rope, to **ASTM A1023/1023M**, class A zinc coating; 7 by 7 and 7 by 19 cross-sectional construction; having a tensile strength of 256,000 psi; lengths, diameters, and wire construction as indicated on Shop Drawings. Cables are pre-cut lengths with fused ends. Pre-made end attachments are available depending on the application.
 - 3. Wire Rope Type 2: High tensile steel wire rope, to **ASTM A492**, Type 316 stainless steel, 7 by 7 cross-sectional construction; having a tensile strength of 256,000 psi; lengths, diameters, and wire construction as indicated on Shop Drawings. Cables are pre-cut lengths with fused ends. Pre-made end attachments are available depending on the application.
 - 4. Y-Fit: Two wire ropes, arranged to form two leg attachment points at one end with a ferrule. Factory-crimped with a 30-ton hydraulic press. For loads up to 200 lbs (5:1 safety factor).
 - 5. Adjustable Fastener Type 1: One-piece die cast type ZA2 zinc two-channel housing; encasing a series of Type 302 stainless-steel springs with serrated self-locking steel wedges, adjustable with setting key or integrated mechanism; UV stabilized homopolymer polypropylene end caps. Sizes as indicated on Shop Drawings. Safe working load (SWL) with 5:1 safety factor. Gripple model HF/XP Adjustable Fastener.

6. Adjustable Fastener Type 2: One-piece Type 316 stainless-steel two channel housing to **ASTM A167**; encasing a series of Type 302 stainless-steel springs with serrated self-locking ceramic wedges, adjustable with setting key; Type 316 A4 stainless-steel end caps. For load of 200 lb or 500 lb. SWL with 5:1 safety factor. Model: Gripple No. 3 or 4 Stainless Steel Adjustable Fastener.
7. Adjustable Fastener Type 3: One-piece die cast type ZA2 zinc one-channel housing; encasing a series of Type 302 stainless-steel springs with serrated self-locking ceramic wedge adjustable with setting key; Type 316 A4 stainless-steel end caps. For load of 200 lb or 500 lb. SWL with 5:1 safety factor. Model: Gripple No. 3 or 4 Stainless Steel Adjustable Fastener.
8. Adjustable Fastener Type 4: One-piece die cast type ZA2 zinc one-channel housing; encasing a series of Type 302 stainless-steel springs with serrated self-locking steel wedge, adjustable with integrated mechanism; UV stabilized homopolymer polypropylene end caps. Sizes as indicated on Shop Drawings. SWL with 5:1 safety factor. Gripple model STZ2/TZ3 Adjustable Fastener.
9. Adjustable Fastener Type 5: Mild steel (type EN1A), bright zinc plated, one-channel body; encasing a series of Type 302 stainless-steel springs with serrated self-locking grade 40 chrome steel balls, adjustable by means of an integrated mechanism, capable of accommodating load of 100 lb, 200 lb, or 500 lb as required. Model No. 2, 3, or 4 Trapeze Plus Adjustable Fastener.
10. Adjustable Fastener Type 6: One-piece die cast type ZA2 zinc two-channel housing; encasing a series of Type 302 stainless-steel springs with serrated self-locking ceramic rollers, adjustable with setting key and extra allen key locking mechanism; UV stabilized homopolymer polypropylene end caps. UL/CSA listed. Manufactured in an ISO 9002 facility. Sizes as indicated on Shop Drawings. SWL with 5:1 safety factor. Gripple Lockable Plus Adjustable Fastener.
11. Adjustable Fastener Type 7: Bright nickel-plated, type ZA2 zinc housing; encasing a Delrin 511P NC010 spring with self-locking brass roller, adjustable with integrated mechanism. For loads up to 30 lb. SWL with 5:1 safety factor. Model: Gripple Angle Hanger Family
12. End Fixing Type 1: Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit (loop, stud, toggle, hook, 90-degree eyelet, or shot fire).
13. End Fixing Type 2 (C-Clip): Zinc ZA2 for load of 100 lb (Gripple No. 2). C-Clip: 1/8 inch or 1/4 inch with crimped loop fastener. Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit.
14. End Fixing Type 2 (Shot Fire Ceiling Clip and Pin): Galvanized steel pin and clip for load of 25 lb (Gripple No. 1) or 100 lb (Gripple No. 2). Shot Fire: C925 with crimped loop fastener. Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit.
15. End Fixing Type 3 (Eyelag): Galvanized steel eyelag screw for load of 25 lb (Gripple No. 1) or 100 lb (Gripple No. 2). Eyelag: ELD with crimped loop

- fastener. Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit.
16. End Fixing Type 4 (Swivel Toggle): Zinc-plated steel, 1-1/2 inches, for load of 100 lb (Gripple No. 2) or 200 lb (Gripple No. 3). Swivel Toggle: Gripple Spider/MDI. Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit.
 17. End Fixing Type 5 (Loop Ferrule): Type 316 stainless-steel, ASTM A167, 1/2 inch by 5/16 inch, for load of 100 lb (Gripple No. 2) or 200 lb (Gripple No. 3). Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit.
 18. End Fixing Type 6 (Toggle Plate and Endstop): Type 304/A2 stainless-steel, 1/4 inch thickness, 5/16 inch by 1-9/16 inch, for load of 100 lb (Gripple No. 2). Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit.
 19. End Fixing Type 7 (Threaded Stud): Type 304/A2 stainless-steel, 1/4 – 20 (M6 x 1) threaded rod, for load of 100 lb (Gripple No. 2) or 200 lb (Gripple No. 3). Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit.
 20. End Fixing Type 8 (Hook Stud): Type 304/A2 stainless-steel, 1/4 inch thickness, 5/8 inch by 3 inches, for load of 100 lb (Gripple No. 2). Mechanically-spliced wire rope with factory end fixing using a 30-ton hydraulic press; to accommodate the design load and safety factor of the fastener kit.
 21. End Fixing Type 9 (Barrel): Zinc-plated steel with aesthetic fixing for use with up to 1/4 inch or 3/8 inch threaded anchor, for load of 200 lb. SWL with 5:1 safety factor.

E. Accessories:

1. Cable Basket Adaptor: Galvanized steel adaptor for load of 100 lb (Gripple No. 2), to suspend cable basket with wire diameter up to 1/4 inch.
2. Y-Fit: Two wire ropes, arranged to form two leg attachment points at one end with a ferrule. Factory-crimped with a 30-ton hydraulic press. For loads of 50 lb (Gripple No. 1), 100 lb (Gripple No. 2) or 200 lb (Gripple No. 3).
3. Karabiner: Galvanized steel karabiner for load of 200 lb with 5:1 safety factor, to suspend cable basket.
4. G-Bracket: Cold formed mild steel bracket (BS EN 10346:2009 DX51D) with slots to support cable trays, for load up to 100 lb (SWL with 3:1 safety rating), compatible with Y-fit range.
5. GF Bracket: Ductile iron with hot dip galvanized finish. Bracket for clamping onto wide flange beam section, suitable for 1/4 inch to 1/2 inch flange thickness, and for use with 1/2 inch diameter threaded rod supplied by others.

F. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedge plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size

and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

- G. Structural Steel for Fabricated Supports and Restraints: **ASTM A 36/A 36M** steel plates, shapes, and bars; black and galvanized.
- H. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hilti, Inc.
 - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.
 2. Mechanical-Expansion Anchors: Insert wedge type, zinc-coated or stainless steel, for use in hardened Portland Cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) B-line, an Eaton business.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti, Inc.
 - 4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
 3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
 5. Through Bolts: Structural type, hex head, and high strength. Comply with **ASTM A 325**.
 6. Toggle Bolts: All stainless-steel springhead type.
 7. Hanger Rods: Threaded steel.

2.03 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in **Section 05 50 00 - Metal Fabrications** for steel shapes and plates.

PART 3 EXECUTION

3.01 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 - 1. **NECA 1.**
 - 2. **NECA 101.**
 - 3. **NECA 102.**
 - 4. **NECA 105.**
 - 5. **NECA 111.**
- B. Comply with requirements for raceways and boxes specified in **Section 26 05 33 - Raceways and Boxes for Electrical Systems.**
- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for **EMT**, **IMC**, and **RMC** as scheduled in **NECA 1**, where its Table 1 lists maximum spacings that are less than those stated in **NFPA 70**. Minimum rod size shall be 1/4 inch in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25-percent in the future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.
- E. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2 inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.02 SUPPORT INSTALLATION

- A. Comply with **NECA 1** and **NECA 101** for installation requirements except as specified in this Section.
- B. Raceway Support Methods: In addition to methods described in **NECA 1**, **EMT**, **IMC**, and **RMC** may be supported by openings through structure members, according to **NFPA 70**.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
1. To Wood: Fasten with lag screws or through bolts.
 2. To New Concrete: Bolt to concrete inserts.
 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 4. To Existing Concrete: Expansion anchor fasteners.
 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete for slabs less than 4 inches thick.
 6. To Steel: Welded threaded studs complying with **AWS D1.1/D1.1M**, with lock washers and nuts or spring-tension clamps.
 7. To Light Steel: Sheet metal screws.
 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.03 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in **Section 05 50 00 - Metal Fabrications** for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with **AWS D1.1/D1.1M**.

3.04 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10-bolt diameters from edge of the base.
- B. Concrete materials, reinforcement, and placement requirements are specified in **Section 03 30 31 - Cast-in-Place Concrete**.
- C. Anchor equipment to concrete base as follows:
1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.05 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with **SSPC-PA 1** requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with **ASTM A 780**.

END OF SECTION

SECTION 26 05 33 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, Division 26, and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that apply to work under this Specification.

1.02 SUMMARY

- A. Section Includes:
 - 1. Metal conduits, tubing, and fittings.
 - 2. Nonmetal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Nonmetal wireways and auxiliary gutters.
 - 5. Floor boxes.
 - 6. Boxes, enclosures, and cabinets.
 - 7. Handholes and boxes for exterior underground cabling.

1.03 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. GRC: Galvanized rigid steel conduit.
- C. IMC: Intermediate metal conduit.

1.04 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.
- C. Samples: For wireways, nonmetallic wireways and surface raceways and for each color and texture specified, provide 12-inch long sample(s).

1.05 INFORMATION SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 - 1. Structural members in paths of conduit groups with common supports.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.

PART 2 PRODUCTS

2.01 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AFC Cable Systems, Inc.
 2. Allied Tube & Conduit.
 3. Anamet Electrical, Inc.
 4. Electri-Flex Company.
 5. FSR Inc.
 6. O-Z/Gedney; and EGS Electrical Group brand.
 7. Patriot Aluminum Products, LLC.
 8. Picoma Industries.
 9. Republic Conduit.
 10. Robroy Industries.
 11. Southwire Company.
 12. Thomas & Betts Corporation, A Member of the ABB Group.
 13. Western Tube and Conduit Corporation.
 14. Wheatland Tube Company.
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with **ANSI C80.1** and **UL 6**.
- D. IMC: Comply with **ANSI C80.6** and **UL 1242**.
- E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
1. Comply with **NEMA RN 1**.
 2. Coating Thickness: 0.040 inch (1 mm), minimum.
- F. EMT: Comply with **ANSI C80.3** and **UL 797**.
- G. FMC: Comply with **UL 1**; zinc-coated steel.
- H. LFMC: Flexible steel conduit with PVC jacket and complying with **UL 360**.
- I. Fittings for Metal Conduit: Comply with **NEMA FB 1** and **UL 514B**.
1. Conduit fittings for Hazardous (Classified) Locations: Comply with **UL 886** and **NFPA 70**.
 2. Fittings for EMT:
 - a. Material: Steel.

- b. Type: Compression.
- 3. Expansion Fittings: PVC or steel to match conduit type, complying with **UL 651**, rated for environmental conditions where installed, and including flexible external bonding jumper.
- 4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.
- J. Joint Compound for IMC, GRC, or ARC: Accepted, as defined in **NFPA 70**, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.02 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Anamet Electrical, Inc.
 - 3. Arnco Corporation.
 - 4. CANTEX INC.
 - 5. CertainTeed Corporation.
 - 6. Condux International Inc.
 - 7. Electri-Flex Company.
 - 8. Kraloy.
 - 9. Lamson & Sessions.
 - 10. Niedax Inc.
 - 11. RACO; Hubbell.
 - 12. Thomas & Betts Corporation, A Member of the ABB Group.
- B. Listing and labeling: Nonmetallic conduits, tubings, and fittings shall be listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.
- C. ENT: Comply with **NEMA TC 13** and **UL 1653**.
- D. RNC: Type EPC-40-PVC, complying with **NEMA TC 2** and **UL 651** unless otherwise indicated.
- E. LFNC: Comply with **UL 1660**.
- F. Rigid HDPE: Comply with **UL 651A**.
- G. Continuous HDPE: Comply with **UL 651B**.
- H. Coilable HDPE: Preassembled with conductors or cables, and complying with **ASTM D 3485**.
- I. RTRC: Comply with **UL 1684A** and **NEMA TC 14**.

- J. Fittings for ENT and RNC: Comply with **NEMA TC 3**; match to conduit or tubing type and material.
- K. Fittings for LFNC: Comply with **UL 514B**.
- L. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to **40 CFR 59**, Subpart D (EPA Method 24).
- M. Solvent cements and adhesive primers shall comply with the testing and product requirements as required for acceptance from the Authority Having Jurisdiction.

2.03 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2. Hoffman; a brand of Pentair Equipment Protection.
 - 3. MonoSystems, Inc.
 - 4. Square D.
 - 5. Wiegmann; division of Hubbell Incorporated.
- B. Description: Sheet metal, complying with **UL 870** and **NEMA 250**, Type 1, unless otherwise indicated, and sized according to **NFPA 70**.
 - 1. Metal wireways installed outdoors shall be NEMA-3R and listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Hinged Type, unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.04 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allied Moulded Products, Inc.
 - 2. Hoffman; a brand of Pentair Equipment Protection.
 - 3. Lamson & Sessions.
 - 4. Niedax Inc.
- B. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.

- C. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.
- D. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.
- E. Fittings and Accessories: Coupling, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for a complete system.
- F. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to **40 CFR 59**, Subpart D (EPA Method 24).
- G. Solvent cements and adhesive primers shall comply with testing and product requirements as required per Authority Having Jurisdiction.

2.05 BOXES, ENCLOSURES, AND CABINETS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Hubbell Incorporated; steel boxes or comparable product by one of the following:
 - 1. Adalet.
 - 2. Cooper Technologies Company.
 - 3. EGS/Appleton Electric.
 - 4. Erickson Electrical Equipment Company.
 - 5. FSR Inc.
 - 6. Hoffman; a brand of Pentair Equipment Protection.
 - 7. Kraloy.
 - 8. Milbank Manufacturing Co.
 - 9. MonoSystems, Inc.
 - 10. Oldcastle Enclosure Solutions.
 - 11. O-Z/Gedney; an EGS Electrical Group brand.
 - 12. RACO; Hubbell.
 - 13. Robroy Industries.
 - 14. Spring City Electrical Manufacturing Company.
 - 15. Stahlin Non-Metallic Enclosures.
 - 16. Thomas & Betts Corporation, A Member of the ABB Group.
 - 17. Wiremold / Legrand.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with **NEMA OS 1** and **UL 514A**.

- D. Cast-Metal Outlet and Device Boxes: Comply with **NEMA FB 1**, ferrous alloy or aluminum, Type FD, with gasketed cover.
- E. Nonmetallic Outlet and Device Boxes: Comply with **NEMA OS 2** and **UL 514C**.
- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing up to 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- G. Small Sheet Metal Pull and Junction Boxes: **NEMA OS 1**.
- H. Cast-Metal Access, Pull, and Junction Boxes: Comply with **NEMA FB 1** and **UL 1773**, cast aluminum or galvanized cast iron with gasketed cover.
- I. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- J. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- K. Gangable boxes are allowed.
- L. Hinged-Cover Enclosures: Comply with **UL 50** and **NEMA 250**, Type 1 with continuous hinge cover with flush latch unless otherwise indicated. Enclosures outside or interior wet locations shall be **NEMA Type 3R** unless otherwise indicated on plans.
 - 1. Metal Enclosures: Steel finished inside and out with manufacturer's standard enamel.
 - 2. Nonmetallic Enclosures: Plastic or fiberglass.
 - 3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- M. Cabinets:
 - 1. **NEMA 250**, Type 1 galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Enclosures outside or interior wet locations shall be **NEMA Type 3R**, unless otherwise indicated on plans.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.

2.06 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
 - 1. Boxes and handholes for use in underground systems shall be designed and identified as defined in **NFPA 70**, for intended location and application.

2. Boxes installed in wet areas shall be listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.
- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armorcast Products Company.
 - b. Carson Industries LLC.
 - c. NewBasis.
 - d. Oldcastle Precast, Inc.
 - e. Quazite: Hubbell Power Systems, Inc.
 - f. Synertech Moulded Products.
 2. Standard: Comply with SCTE 77.
 3. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
 4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 6. Cover Legend: Molding lettering, "ELECTRIC" or "SYSTEMS".
 7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
 8. Handholes 12 inches wide by 24 inches long and larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

PART 3 EXECUTION

3.01 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed Conduit: **GRC**.
 2. Concealed Conduit, Aboveground: **EMT**.
 3. Underground Conduit: **RNC**, Type EPC-40-PVC unless otherwise indicated on plans. Concrete encased under roadways and streets, or areas subject to vehicular traffic.
 4. Connection to vibrating equipment (Including transformers and hydraulic, pneumatic, electric solenoid, or motor-driven equipment): **LFMC**.
 5. Boxes and enclosures, aboveground: **NEMA 250**, Type 3R unless otherwise indicated on plans.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed, not subject to physical damage: **EMT**.
 2. Exposed, not subject to severe physical damage: **EMT**.

3. Exposed, and subject to severe physical damage: **GRC**. Raceway locations include the following:
 - a. Loading docks.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical Rooms.
 - d. Gymnasiums.
4. Concealed in Ceilings and Interior Walls and Partitions: **EMT**.
5. Connection to vibrating equipment (Including transformers and hydraulic, pneumatic, electric solenoid, or motor-driven equipment): **FMC**, except use **LFMC** in damp or wet locations.
6. Damp or Wet Locations: **GRC**.
7. Boxes and Enclosures: **NEMA 250 Type 1**, except use **NEMA Type 4** stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4 inch trade size.

- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with **NEMA FB 2.10**.
 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 3. EMT: Use compression fittings. Comply with **NEMA FB 2.10**.
 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with **NEMA FB 2.20**.

E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

G. Install surface raceways only where indicated on Drawings.

H. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.02 INSTALLATION

- A. Comply with **NECA 1** and **NECA 101** for installation requirements except where requirements on Drawings or in this Section are stricter. Comply with **NECA 102** for aluminum conduits. Comply with **NFPA 70** limitations for types of raceways allowed in specific occupancies and number of floors.

- B. Keep raceways at least 6 inches away from parallel runs of flues and steam hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in **Section 26 05 29 - Hangers and Supports for Electrical Systems** for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slabs.
- F. Install no more than the equivalent of four (4) 90-degree bends in any conduit run except for control wiring circuits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- J. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- K. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4 inch trade size and insulated throat metal bushings on 1-1/2 inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- O. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

- P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12-inches of slack at each end of pull wire. Cap underground raceways as designated as spare above grade alongside raceways in use.
- Q. Surface Raceways:
1. Install surface raceway with a minimum 2-inch radius control at bend points.
 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- R. Install raceway sealing fittings at accessible locations according to **NFPA 70** and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to **NFPA 70**.
- S. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where an underground service raceway enters a building or structure.
 3. Where otherwise required by **NFPA 70**.
- T. Comply with manufacturer's written instructions for solvent welding **RNC** and fittings.
- U. Expansion-Joint Fittings:
1. Install in each run of aboveground **RNC** that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25-feet. Install in each run of aboveground **RMC** and **EMT** conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100-feet.
 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
 - d. Attics: 135 deg F temperature change.
 3. Install fittings that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fittings that provide expansion and contraction for at least

- 0.000078 inch per foot of length and straight run per deg F of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- V. Flexible Conduit Connections: Comply with **NEMA RV 3**. Use a maximum of 72 inches of flexible conduit for equipment, including light fixtures, subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use **LFMC** in damp or wet locations subject to severe physical damage.
 2. Use **LFMC** or **LFNC** in damp or wet locations not subject to severe physical damage.
- W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- X. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- Y. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- Z. Locate boxes so that cover or plate will not span different building finishes.
- AA. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- BB. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- CC. Set metal floor boxes level and flush with finished floor surface.
- DD. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.03 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in **Section 31 23 33 - Trenching and Backfilling** for pipe less than 6 inches in nominal diameter

2. Install backfill as specified in **Section 31 23 33 - Trenching and Backfilling**.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in **Section 31 23 33 - Trenching and Backfilling**.
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
6. Underground Warning Tape: Comply with requirements in **Section 26 05 53 - Identification for Electrical Systems**.

3.04 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2 inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Install handholes with bottom below frost line, below grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.
- F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size

holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.05 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.06 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.07 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

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SECTION 26 05 41 UNDERGROUND ELECTRICAL CONSTRUCTION

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, Division 26, and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that applies to work under this Specification.

1.02 SUMMARY

- A. This Section includes the requirements for trenching, backfilling, and installation of underground conduits, ducts, and ductbanks, and the design, fabrication, delivery and installation of pullboxes, handholes, vaults, and manholes.

1.03 REFERENCES

- A. ASTM (American Society for Testing and Materials).
- B. NFPA 70 (National Fire Protection Association) – National Electrical Code.
- C. ANSI C2 “National Electrical Safety Code”.

1.04 SUBMITTALS

- A. Submit under provisions of **Section 01 33 00 - Submittal Procedures**.
- B. Submit catalog cuts for all items proposed to be furnished and installed under this Section.
- C. Provide submittals which shall include the following:
 - 1. Provide product data for accessories for vaults and handholes, conduit, duct, ductbank materials, and miscellaneous components.
 - 2. Shop drawings showing details and design calculations for precast vaults and handholes, including reinforcing steel.
 - 3. Certificate for concrete and steel used in underground precast concrete utility structures, according to ASTM C 858.
 - 4. Inspection report for factory inspections, according to ASTM C 1037.
 - 5. Provide CDF and concrete submittals in accordance with **Section 03 30 31 - Cast-In-Place Concrete**.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.

- B. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.
- C. Provide products listed and classified by Underwriters Laboratories (UL) as suitable for the purpose specified and indicated.
- D. Conform to requirements of **ANSI C2** "National Electrical Safety Code" for components and installation.

1.06 DEFINITIONS

- A. Duct: Electrical conduit and other raceway, either metallic or nonmetallic, used underground, embedded in earth or concrete.
- B. Ductbank: Two or more conduits or other raceway installed underground in the same trench or concrete envelope.
- C. Handhole: An underground junction box in a duct or ductbank.
- D. Vault: An underground utility structure, large enough for a person to enter, with facilities for installing, operating, and maintaining equipment and wiring.

1.07 COORDINATION

- A. Coordinate layout and installation of ducts, vaults, and handholes with final arrangement of other utilities as determined by field verification. Revise locations and elevations from those indicated as required to suit field conditions and ensure that duct runs drain to vaults and handholes.

1.08 SAFETY REQUIREMENTS

- A. Perform work in accordance with the safety requirements of the Department of Labor Occupational Safety and Health Administration, Volume 36, Number 75, Part II, Subpart P, "Excavations, Trenching, and Shoring", and with Section 7 of the Manual of Accident Prevention in Construction as published by the Association of General Contractors of America, Inc.
- B. Educate supervisors and employees on safety requirements and practices to be followed during the course of the work.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ducts to the site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.
- B. Store pre-cast concrete units at the site as recommended by the manufacturer to prevent physical damage. Arrange so identification markings are visible.

- C. Lift and support pre-cast concrete units only at designated lifting or supporting points.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manholes, Vaults, and Handholes: Subject to compliance with requirements, provide products by one of the following:
 - 1. Utility Vault Company (OldCastle Precast).
 - 2. Jensen Precast.
 - 3. Hubbell Quazite.
 - 4. Or other reviewed and accepted Manufacturers.

2.02 CONDUIT AND DUCTS

- A. Metallic Conduit: Rigid Galvanized Steel Conduit (RMC): ANSI C80.1.
- B. Non-Metallic Conduit:
 - 1. Rigid PVC Conduit: **NEMA TC 2**, UL 651A, Schedule 40 and Schedule 80 PVC, sunlight resistant, rated for use with 90 deg C conductors under all installation conditions and UL labeled for underground use, direct burial, or aboveground.

2.03 CONDUIT FITTINGS

- A. Steel Fittings: Zinc coated, cast malleable, ferrous metal, threaded fittings, with neoprene cover gasket on each fitting installed outdoors.
- B. PVC Conduit and Tubing Fittings: **NEMA TC 3**.
- C. "Mogul Fittings": Provide "Mogul" size fittings for all conduit.
- D. Seal Bushings: Compound filled bushing on each conduit entering a building from outside underground and on each conduit passing from one space into another, which is normally at a lower temperature.
- E. Hubs: Appleton "Hub", "Hub-U" Series, Thomas & Betts "370" Series, or accepted equal hub on each conduit terminating in a box where a hub was not previously provided.
- F. Unions: Three piece threaded conduit unions where necessary.

2.04 DUCT SUPPORTS

- A. Rigid PVC spacers selected to provide 3-1/2 inch minimum duct spacing or as indicated on Drawings.

2.05 PULLBOXES

- A. Cast Metal Boxes: Cast aluminum, sized as indicated on drawings or per codes, with outside flanges and recessed, gasketed cover for flush mounting. Non-skid finish on cover with legend reading "ELECTRIC", "COMMUNICATIONS", or "SIGNAL" as appropriate. Provide traffic-rated, H20 minimum loading, in areas subject to vehicle traffic or access drives.

2.06 HANDHOLES

- A. General: Pre-cast concrete or structural plastic with the following standard features:
 - 1. Cover with insert or other device to facilitate lifting.
 - 2. Cover with locking devices similar to REA or FARGO.
 - 3. Drain hole in base, 2 inch minimum diameter.
 - 4. Knockouts in sides of adequate number and spacing to accommodate ductbank shown on Drawings.
- B. Exterior Lighting: Reinforced plastic mortar designed and tested to temperatures of -50 degrees F meeting **ASTM D635-91** flammability test.
- C. Handhole Covers: Reinforced concrete, cast iron, or structural plastic, capable of supporting designed loads. Where located in roadways or traffic areas, covers shall be designed to support H20 minimum loading. Cast iron cover with cast-in-legend "ELECTRIC", "COMMUNICATIONS", or "SIGNAL" as appropriate. Machine cover-to-frame bearing surfaces.

2.07 ACCESSORIES

- A. Duct Supports: Rigid PVC spacers selected to provide 3-1/2 inch minimum duct spacings and concrete cover depths as indicated on the Drawings, while supporting ducts during concrete pour.
- B. Sump Frame and Grate: Comply with **FS RR-F-621**, Type-VII for frame and Type-I for cover.
- C. Bolting Inserts for Cable Racks: Flared, threaded inserts of non-corrosive, chemical resistant, non-conductive thermoplastic material 36-inches on center; 1/2-inch internal diameter by 2-3/4 inches deep, flared to 1-1/4 inch minimum at base. Tested ultimate pull-out strength: 12,000 pounds minimum.
- D. Expansion Anchors for Installation after Concrete is Cast: Zinc plated carbon steel wedge type with stainless steel expander clip, 1/2-inch bolt size, 5300-pound rated pull-out strength, and 6800-pound rated shear strength minimum.
- E. Cable Racks: Non-metallic cable rack stanchion, 36-inch high X 4-inch wide, yellow Glass Reinforced Polymer, elongated mounting holes.

- F. Cable Arms: Non-metallic cable rack arms. Size and weight capacity in accordance with manufacturer's load rating.
- G. Cable Support Insulators: High glaze, wet process porcelain arranged for mounting on cable arms.
- H. Ground Rods: Solid copper clad steel, 3/4-inch diameter by 10-foot length or as indicated on Drawings.
- I. Ground Wire: Stranded bare copper, #4/0 AWG minimum or as indicated on the Drawings.
- J. Duct Sealing Compound: Non-hardening, safe for human skin contact, not deleterious to cable insulation, workable at temperatures as low as 35 deg F withstands temperature of 300 deg F without slump, and adheres to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and the common metals.

2.08 DUCTBANK CONCRETE

- A. Ductbanks below roads, driveways, and anywhere where vehicles will travel shall be installed in concrete. Ductbanks entering buildings shall be installed in concrete within 10-feet of building.
- B. Material:
 - 1. Gravel: 3/8-inch maximum.
 - 2. Slump: 4-inch maximum.
 - 3. Compressive Strength: 3,000 psi at 28-days.
 - 4. Color: Dye ductbank concrete red.
 - 5. Reinforcing (except when RMC is used): Steel conforming to **ASTM A15**. Provide No. 4 rebar top and bottom, 24-inch lap at splices (typical 4 places) and No. 4 at 18-inches on center around perimeter with 3-inch minimum cover. Ductbank crossing below wall footings or within line of soil influence below the footing requires No. 4 rebar at 6-inches on center around perimeter.

2.09 BACKFILL MATERIAL

- A. Reinforced Concrete Ductbanks: Provide in accordance with **Section 31 23 33 - Trenching and Backfilling** in locations shown on Drawings:
 - 1. Below Concrete Encasement: 6-inches minimum compacted 5/8-inch minus crushed rock.
 - 2. Above Concrete Encasement: 3-inch minimum sand.
 - 3. Upper Trench:
 - a. Areas under Pavement: Controlled Density Fill:
 - 1) Content: A mixture of Portland cement, fly ash, aggregates, water and admixtures proportioned to provide a non-segregating, self-consolidating and free flowing material which will result in a hardened,

dense, non-settling and excavatable fill. Batch and mix in accordance with **Section 03 30 31- Cast-In-Place Concrete** to provide a flowing, non-segregating mix with a slump between 6-inch and 8-inch.

- b. Areas not under Pavement: Select Native Fill:
 - 1) Unsaturated excavated earth free of rocks, broken concrete and debris 6-inch and larger, and compacted in 12-inch lifts to prevent settlement.
- c. Provide Underground Warning Tape 3-inches (76 mm) wide polyethylene tape, detectable type colored red with suitable warning label describing buried electrical lines, buried 12-inches below grade.

B. Direct Burial Conduit:

- 1. Initial Bedding: 3-inches of sand below conduits.
- 2. Secondary Bedding: Unsaturated excavated earth free of rocks, broken concrete, and debris 2-inches and larger, and compacted to 6-inch minimum above conduits.
- 3. Upper Trench:
 - a. Areas under Pavement: Controlled Density Fill:
 - 1) Content: A mixture of Portland cement, fly ash, aggregates, water and admixtures proportioned to provide a non-segregating, self-consolidating, and free flowing material which will result in a hardened, dense, non-settling and excavatable fill. Batch and mix in accordance with **Section 03 30 31- Cast-In-Place Concrete** to provide a flowing, non-segregating mix with a slump between 6-inch and 8-inch.
 - b. Areas not under Pavement: Select Native Fill:
 - 1) Unsaturated excavated earth free of rocks, broken concrete, and debris 6-inch and larger, and compacted in 12-inch lifts to prevent settlement.
 - c. Provide Underground Warning Tape 3-inches (76 mm) wide polyethylene tape, detectable type colored red with suitable warning label describing buried electrical lines, buried 12-inches below grade.

C. Material:

- 1. Gravel: 3/8-inch maximum.
- 2. Slump: 4-inch maximum.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine site to receive ducts and vaults for compliance with installation tolerances and other conditions affecting performance of the underground ducts and vaults. Do not proceed with installation until unsatisfactory conditions have been corrected and installations have been inspected by WA State Labor & Industries (LNI) Inspectors.
- B. Existing Utilities: Locate all existing utilities in the area prior to performing any trenching or excavation work. Coordinate with Civil.

3.02 EARTHWORK

- A. Comply with Division 31, Earthwork.
- B. Trenching:
 - 1. Comply with **OSHA/WISHA** safety standards for trenching, including stable slope and shoring requirements.
 - 2. Depth: Refer to drawings for trench depth requirements. Correct points of over-excavation using mechanically compacted backfill to form a smooth trench bottom.
 - 3. Width: Excavate to minimum width consistent with stability of sides.
 - 4. Slope: Slope trenches so that conduit and ducts drain toward vaults and handholes and away from buildings and equipment.
 - 5. Muck Excavation: Where much or unstable material is encountered, over excavate and backfill to attain proper grade with coarse sand, gravel, or controlled density fill.
 - 6. Pile backfill material in an orderly manner; a sufficient distance from the trench to avoid overloading trench banks.
 - 7. Bedding: The entire bottom of the excavation is to be firm, stable, and at uniform density.
- C. Excavating for Handholes and Vaults: Provide 12-inch minimum clearance between outer surfaces of unit and embankment or timber used for shoring.

3.03 BACKFILLING

- A. See **Section 31 23 33 - Trenching and Backfilling**.

3.04 RACEWAY APPLICATIONS

- A. Refer to Specifications and Drawings for raceway materials.
- B. Metallic Conduit: Only use as specified in **Section 26 05 33 - Raceways and Boxes**.
- C. Non-Metallic Conduit: Use underground only:
 - 1. Underground in Reinforced, Concrete Encased Ductbanks: Use Schedule 80 Rigid Plastic Conduit as standard (except rigid steel under roadways). Use rigid steel on bends 45 degrees or greater. Use of Schedule 40 PVC Conduit under non-traffic areas is acceptable unless noted otherwise on plans.
 - 2. Underground Direct Burial: For low voltage applications only where identified on Contract Drawings. Use in reinforced, concrete encased ductbanks: Use Schedule 80 Rigid Plastic Conduit as standard (except rigid steel under roadways). Use rigid steel on bends 45 degrees or greater. Use of Schedule 40 PVC Conduit under non-traffic areas is acceptable unless noted otherwise on plans .
 - 3. All underground conduit shall be a minimum of 2-inch standard trade size, except as permissible to use 1-inch for exterior lighting, control, etc. as shown in Drawings.

4. Use PVC fittings for PVC conduit and suitable watertight connections where PVC conduit connects to galvanized steel conduit.
5. Galvanized rigid steel conduit installations underground or under concrete slab shall be factory coated with 3-mil bitumastic or protected with 3M Scotchrap pipe primer and Scotchrap 50 (10-mil) spirally applied half-lapped tape.

3.05 CONDUIT AND DUCT INSTALLATION

- A. Install conduit and as indicated on Drawings and according to manufacturer's written instructions.
- B. Ductbanks with electric and communications service conduits for Utility Companies service conductors and cables shall be installed in concrete.
- C. Ductbanks below roads, driveways, and any locations where vehicles will travel shall be installed in concrete.
- D. Ductbanks entering buildings shall be installed in concrete within 10-feet of building.
- E. Slope: Pitch ducts minimum of 4-inches per 100 feet to drain toward vaults and handholes and away from buildings and equipment or as indicated on the Drawings. Slope ducts from a high point in runs between (2) vaults to drain in both directions.
- F. Curves and Bends: Use manufactured galvanized rigid steel elbows for stub-ups at equipment and at building entrances with a minimum radius of 36-inches. Use long sweep bends with a minimum radius of 25-feet both horizontally and vertically at other locations, not to exceed 20 degrees for field bends or as indicated on the Drawings.
- G. Make joints in ducts and fittings watertight according to manufacturer's instructions. Stagger couplings so those of adjacent ducts do not lie in the same plane.
- H. Duct Entrances to Vaults and Handholes: Space end bells approximately 8-inches on center for 4-inch ducts and varied proportionately for other duct sizes. Change from regular spacing to end bell spacing 10-feet from the end bell without reducing duct line slope and without forming a trap in the line. Grout end bells into vault walls from both sides to provide watertight entrances.
- I. Separation between direct buried, non-encased ducts: Provide 3-inches minimum separation for like services, and 12-inches minimum between power and communication/signal ducts.
- J. Concrete Encased Non-Metallic Ducts: Support on plastic separators coordinated with duct size and required duct spacing, and install according to the following:
 1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts at 8-feet maximum, and secure separators to the

- earth and to ducts to prevent floating during concreting. Do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
2. Concrete: Do not pour concrete until conduit installation has been accepted by Owner's Representative and the City of Tacoma Inspector. Spade concrete carefully during pours to prevent voids under and between conduits and at the exterior surface of the envelope. Do not use power driven agitating equipment unless specifically designed for ductbank application. Pour each ductbank between vaults or other terminations in one continuous operation. When more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing rod dowels extending 18-inches into the concrete on both sides of the joint near the corners of the envelope.
 3. Reinforcing: Reinforce ductbanks where they cross disturbed earth.
 4. Forms: Use the walls of the trench to form the side walls of the ductbank where the soil is self-supporting and the concrete envelope can be poured without soil inclusions; otherwise, use forms.
 5. Minimum Clearances Between Ducts: 3-inches between ducts and exterior envelope wall, 3-inches between ducts for like services, and 12-inches between power and communication/signal ducts, or as indicated on the Drawings.
 6. Depth: Install top of ductbank at least 18-inches below finished grade in non-traffic areas and at least 24-inches below finished grade in vehicular traffic areas.
- K. Stub-Ups: Use rigid steel conduit for stub-ups through concrete to equipment. Install insulated grounding bushings at the conduit terminations. For equipment mounted on outdoor concrete pads, extend steel conduit a minimum of 4-inches beyond the edge of the pad. Couple steel conduits to the ducts with adapters designed for the purpose and then encase the coupling with 3-inches of concrete.
- L. Sealing: Provide temporary closure at all duct terminations in vaults installed on this Project. Use sealing compound and plugs to withstand a minimum of 15 psi hydrostatic pressure.
- M. Pulling Wire: Install 100-pound test nylon cord in installed ducts, including spares, or pull rope as indicated on the Drawings.

3.06 UNDERGROUND WARNING TAPE

- A. Warning tape shall be installed directly above the pipe or concrete for encased ducts, at a depth of 12-inches below finished grade unless otherwise shown.

3.07 PERMANENT MARKERS

- A. Where ducts (conduits) are stubbed below grade for future services, provide graystone Index PC 3.06 Surveyor's Monument located directly over end of stubbed duct with top at finished grade, with marking indicating system piping serves.

- B. Advise City of Tacoma survey crew for record via the City's inspector on-site for coordination.

3.08 IDENTIFICATION

- A. Identify raceways, cables, and equipment as specified in **Section 26 05 53 - Identification for Electrical Systems**, or as indicated on Drawings.
- B. Provide warning and caution signs as required by the Authority Having Jurisdiction, these Specifications, or as indicated on Drawings.
- C. Label raceways entering concealed locations from exposed locations as to the destination via the concealed area.

3.09 TESTING AND CLEANING

- A. Verify that vaults and handholes are essentially dry. In the case where the presence of water will prevent the continuation of work, pump the vault or handhole dry and seal obvious leak points with epoxy grout or polyurethane-based water sealant. For plugging conduits use a plug capable of 15 psi hydrostatic pressure. Coordinate pumping discharge with the Project Representative.
- B. Pull brush through full length of ducts. Use round bristle brush with a diameter of 1/2-inch greater than internal diameter of duct. Clean internal surfaces of vaults and handholes, including sump.
- C. Duct Integrity: Swab out ducts with a mandrel 1/4-inch smaller in diameter than internal diameter of ducts. An Owner's Representative shall be present to witness all mandrel pulls.
- D. Grounding: Test vault grounding to ensure electrical continuity of bonding and grounding connections in accordance with **Section 26 05 26 - Grounding and Bonding**. Measure ground resistance at each ground rod and report in final test results per **Section 26 08 00 – Commissioning of Electrical Systems**. Use an instrument specifically designed for ground resistance measurements.
- E. Written certification by electrical contractor that all testing and cleaning has been tested and cleaned per Specifications. Provide written certification that vaults are grounded and meet or exceed the requirements of this section. Provide written certification as to testing and testing results to Engineer, Commissioning Authority, and included in O&M Manual.

END OF SECTION

SECTION 26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, Division 26, Division 27, and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that apply to work under this Specification.

1.02 SUMMARY

- A. Provide completely identified electrical systems and equipment that complies with the current edition of the National Electrical Code (NEC), and all applicable regulatory codes.

1.03 CALCULATIONS AND LABELLING

- A. Provide complete Arc-Flash Hazards Calculation Report and label all equipment required per NFPA 70E to properly identify arc-flash hazards. Contractor is required to pay for and submit Arc-Flash Hazards Calculation to the Project Representative for review and acceptance prior to commencing work.

1.04 LABELLING GENERAL

- A. Label each and every circuit breaker in the Main Switchboard(s) or Distribution Board(s) with a phenolic nameplate that identifies the load and location served.
- B. Label all panelboards with a phenolic nameplate that also identifies the voltage, ampere rating, and source panel.
- C. Provide a sign on the cover of each panelboard requiring a minimum of 36" or 42" of clear working space in front of the panel.
- D. Label all disconnect switches and motor starters and permanently mounted electrical loads and control equipment with a phenolic nameplate that identifies the source panel, circuit number, and the load served.

1.05 REFERENCES

- A. ANSI/NFPA 70 – National Electrical Code.
- B. NFPA 70E – Standard for Electrical Safety in the Workplace.
- C. ASTM International.

1.06 GENERAL REQUIREMENTS

- A. Electrical and Communications Vaults shall be properly labeled per ID shown on the Drawings.
- B. Underground conduits shall be properly labeled in vaults and in buildings where conduits stub up from below grade. Contractor shall be responsible for the ID names/numbers.
- C. Electrical and Low-Voltage Equipment shall have placards with appropriate ID on front covers of equipment.
- D. All interior conduit and junction boxes shall be labelled with panel name and circuit numbers of conductors routed via conduit and junction boxes.
- E. Conductors shall be properly identified with both color coding and self-adhesive labels.
- F. All equipment per **NFPA 70E** that requires arc-flash labelling shall be properly identified per **NFPA 70E**.

1.07 SUBMITTALS

- A. Product Data: Provide catalog data for nameplates, labels, and markers.
- B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Quality Assurance. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- C. Arc-Flash Hazards Calculation: Provide complete arc-flash hazards calculation per NFPA 70E to the Project Representative for review and acceptance.
- D. Underground Conduit Ductbanks: Provide site plan with identification names/numbers of individual conduits, vaults, and handholes for the Project Representative review and acceptance.

1.08 QUALITY ASSURANCE

- A. Products: Listed and classified by Underwriters Laboratories (UL) as suitable for purpose specified as shown.
- B. Comply with **NFPA 70** and **NFPA 70E**.

1.09 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications and with those required by codes and standards.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in unopened factory labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

- A. Buried Electrical Lines: Underground warning tapes.
- B. Communication Cabinets: Nameplates.
- C. Conduit: Conduit Markers.
- D. Electrical Distribution and Control Equipment Enclosures: Nameplates.
- E. Transformers: Nameplates.
- F. Junction Box Load Connections: Wire Markers.
- G. Outlet Box Load Connections: Wire Markers.
- H. Outlet Box Wall Cover Plates: Laser Etching.
- I. Panel Gutter Load Connections: Wire Markers.
- J. Pull Box Load Connections: Wire Markers.
- K. Communication and Electrical Vaults: Nameplates.

2.02 NAMEPLATES AND LABELS

- A. Manufacturers:
 - 1. Marking Services, Inc. (MSI): <http://www.markserv.com>
 - 2. Double O Laser Services, Inc.: <http://www.doubleolaser.com>
 - 3. Or other reviewed and accepted manufacturers.
- B. Panelboard, Distribution Board, and Equipment Disconnect Nameplates:
Engraved plastic, high contrast for maximum visibility. 1/16" engraving plastic with either mounting holes or adhesive backing.
 - 1. Normal Power: White letters on black.
 - 2. Emergency Power: Black letters on orange.

3. Panelboard and Distribution Board Labels:

Description:	Example:
Panel Name:	1M
Voltage:	480/277V
Amperes:	800A
Supplied From:	MSB-1

4. Equipment Disconnect Labels:

Description:	Example:
Equipment Name:	AHU-1
Voltage/Phase:	480V/3PH
Rated Load:	20HP
Supplied From:	PANEL 1M

- C. Load Equipment Nameplates: Laser engraved black impression stainless steel with brushed satin finish & permanent black impression.
1. 430 Alloy, .029 thick.
 2. 1/8" holes for attachment to equipment with stainless steel self-drilling screws.
 3. Letter Size:
 - a. Load Equipment Name: use 0.375-inch letters.
 - b. All others: use 0.25-inch letters.
- D. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background. Use only for identification of individual wall switches, receptacles, control device stations.
- E. Warning/Safety Labels: Industry standard self-adhesive warning/safety labels. Provide industry standard labeling, code required and per Authority Having Jurisdiction.

2.03 DEVICE AND JUNCTION BOXES

- A. Manufacturer pre-painted junction box cover plates:
1. 480/277V Normal Power System: Yellow.
 2. 208/120V Normal Power System: Blue.
- B. Identify power circuits contained within junction boxes using permanent black ink marker with Panel Name and Circuit Number on cover plate of junction box.

2.04 OUTLET BOX COVER PLATES

- A. Laser etched with panel name and circuit number on stainless steel cover plates. Laser etching shall be by **Marking Services, Inc. (MSI)**. Refer to the following for examples:

Panel Name – Circuit Number	-	2X4A – 22
Panel Name – Circuit Numbers	-	1M4A – 1,3,5

2.05 CONDUCTOR IDENTIFICATION

- A. Manufacturers:
1. Brady Corporation: Model (B-702).
 2. Or other reviewed and accepted Manufacturers.
- B. Description: Vinyl cloth type self-adhesive wire markers.
- C. Color: Black on White.
- D. Legend:
1. Power and Lighting Circuits: Branch circuit or feeder number indicated on Drawings.
- E. Wire Color Coding:
1. Single Phase, 3-Wire System: 120/240-Volt.
 2. Three Phase, 4-Wire System: 120/208-Volt.
 3. Three Phase, 4-Wire System: 277/480-Volt.
 4. Equipment Ground Wire: Green.
 5. Control wiring shall be black with identifying wire numbers at each termination.
 6. Color-coded tape may be used in lieu of color-coded insulation for conductors #8 AWG and larger. However, when color coded tape is used, the conductor insulation shall be black only and shall be tape identified with color scheme shown above at splices, terminations, and junction boxes.

2.06 RACEWAY IDENTIFICATION

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Provide conduit identification at both ends of all Medium Voltage Conduits, Low Voltage Conduits, and Communications Conduits identifying systems contained within conduits and “to” location for other end of conduit. This requirement applies to both site underground conduits routed between vaults, buildings, and also conduits within Buildings.

2.07 CONDUIT MARKERS

- A. Location: Furnish markers for each conduit longer than 6-feet (2m).
- B. Spacing: 20-feet (6m) on center.
- C. Color:
 - 1. 480/277 Volt System: Yellow.
 - 2. 208/120 Volt System: Blue.
 - 3. Fire Alarm System: Red.
 - 4. Telecommunication System: Gray.
- D. Underground Conduit Entering Vaults:
 - 1. Brass conduit tags.
 - 2. .032-inch (20 gauge) brass.
 - 3. 3/16-inch hole for easy mounting.
 - 4. Top line 1/4-inch text with second line 1/2-inch number is standard.
 - 5. Tag shall identify conduit by system and location of other end of conduit. E.g., "FIBER – RM K104". Identify "SPARE" for system for empty conduits.

2.08 UNDERGROUND WARNING TAPE

- A. Underground Warning Tape: 3-inches (76 mm) wide polyethylene tape, detectable type colored red with suitable warning label describing buried electrical lines.
- B. Warning tape shall be acid and alkali-resistant and shall have a minimum strength of 1,750 psi lengthwise and 1,500 psi crosswise, with an elongation factor of 350%.

2.09 WARNING/SAFETY LABELS

- A. Self-adhesive, industry standard labels.
- B. Provide labels per code requirements and per Authority Having Jurisdiction.
- C. Provide the following label on front of all 208V or 240V Panelboards, Distribution Boards, and Switchboards:

CAUTION

AREA IN FRONT OF

ELECTRICAL PANEL

MUST BE KEPT CLEAR

FOR 36 INCHES

- D. Provide the following label on front of all 480V Panelboards, Distribution Boards, and Switchboards:

CAUTION

AREA IN FRONT OF

ELECTRICAL PANEL

MUST BE KEPT CLEAR

FOR 48 INCHES

- E. Provide the identification label/sign at all Emergency Power Off "EPO" pushbuttons, stating Panel Name pushbutton controls (shunts off).

2.10 CABLE TIES

- A. General-Purpose Cable Ties: Fungus insert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon:
1. Minimum width: 3/16".
 2. Tensile strength at 73-degrees F, according to ASTM D 638: 12,000 psi.
 3. Temperature Range: Minus 40 to plus 185-degrees F.
 4. Color: Black.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Degrease and clean surfaces to receive nameplates and labels.
- C. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- D. Apply identification devices to surfaces that require finish after completing finish work.
- E. Self-Adhesive Identification Products: Clean surfaces before application, using materials, and methods recommended by manufacturer of identification device.
- F. Attach sign and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- G. Attach plastic raceway and cable leads that are not self-adhesive type with clear vinyl tape with adhesive appropriate to the location and substrate.

- H. Install nameplates and labels parallel to equipment lines.
- I. Secure nameplates to equipment front using screws or rivets.
- J. Identify empty conduit at each end with permanent ink marker. Indicate function and termination location of other end.
- K. Identify underground conduits using underground warning tape. Install one tape per trench at 3-inches, or as indicated in Drawings, below finished grade.
- L. Each outdoor conduit shall be labeled with the location of the opposite end of the conduit, and numbered as C# (Where C stands for conduit and # is increased with each conduit in the set).
 - 1. For example, if 2 conduits are installed between vault 101 and vault 102, both conduits in vault 101 shall have a weatherproof label and be labeled "C1 To Vault 102" and "C2 To Vault 102" while both conduits in vault 102 shall be labeled "C1 To Vault 101" and "C2 To Vault 101" respectively. If a conduit ends in a building, the building name and room number shall be labeled as the destination.

END OF SECTION

SECTION 26 08 00 COMMISSIONING OF ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, and Division 26.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that apply to work under this Specification.

1.02 SUMMARY

- A. The purpose of this section is to specify the Contractor's responsibilities relative to Division 26 and participation in the commissioning process.
- B. Organization of the commissioning program is primarily the responsibility of the Commissioning Authority (CA) hired by the owner. Execution of the program is primarily the responsibility of the Contractor with support from Division 26 for:
 - 1. Testing and startup of the electrical equipment.
 - 2. Completion and endorsement of pre-functional test checklists provided by the Commissioning Authority to assure Division 26 equipment and systems are fully operational and ready for functional testing.
 - 3. Providing qualified personnel to assist the Commissioning Authority with functional testing to verify equipment/system performance.
 - 4. Providing equipment, materials, and labor necessary to correct deficiencies found during the commissioning process which fulfill Contract and warranty requirements.
 - 5. Providing training for the systems specified in Division 26 with the coordination of the Owner by the Commissioning Authority.
- C. Division 26 shall cooperate with the Commissioning Authority in the following manner:
 - 1. Allow sufficient time before final completion dates so that electrical testing, lighting control checkout, and functional testing can be accomplished.
 - 2. Provide labor and material to make corrections when required without undue delay.
 - 3. Put all electrical systems and equipment into full operation and continue the operation of the same during each working day of commissioning.
- D. Test the entire electrical installation to assure compliance with Codes and proper system operation.
- E. Electrical systems commissioning consists of static checks of component and system installations and actual testing of equipment conditions and functions.

- F. The Commissioning Authority shall review and accept, prior to use, all test procedures and forms used and shall witness a varying fraction of the checks and testing performed by the Contractor. The Commissioning Authority shall review the completed check and test documentation of the Contractor for all checks and tests.

1.03 SUBMITTALS

- A. Thirty (30) days before any testing is conducted, submit an overall testing plan and schedule for electrical systems that lists the equipment, modes to be tested, dates of testing and parties conducting the tests. Put these tests into the master construction schedule. Keep this plan and schedule updated throughout the Project.

1.04 QUALITY ASSURANCE

- A. A Certified Testing Company shall perform the work of this Section, and shall be qualified to test electrical equipment, and is a NETA (National Electrical Testing Association) Certified Testing Agency. The Certified Testing Company shall not be associated with the manufacturer(s) of the equipment or systems under test.
- B. The Contractor shall provide all test equipment necessary to fulfill the checks and testing requirements. Test equipment shall have been calibrated within one (1) year of its use on this Project.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

- A. Standard certified test equipment for commissioning shall be provided by the Commissioning Authority.
- B. Proprietary test equipment required by the manufacturer shall be provided by the manufacturer of the equipment. Manufacturer shall provide the test equipment, demonstrate its use, and assist the Commissioning Authority in the commissioning process.

2.02 MATERIALS AND INSTRUMENTATION

- A. All testing and commissioning materials and instrumentation shall be provided by and remain the property of the Contractor.

PART 3 EXECUTION

3.01 WORK PRIOR TO COMMISSIONING

- A. Specific pre-commissioning responsibilities of Division 26 are as follows:

1. Normal startup services as required to bring each system into a fully operational state.
2. Complete pre-functional test checklists for all equipment and systems to be commissioned.
3. Portions of mechanical equipment startup requiring electrical connections and metering.
4. Factory startup services for key equipment and systems specified in Division 26. The Division 26 Contractor shall coordinate this work with the manufacturer and the Commissioning Authority.
5. Demonstrate system readings as requested by the Commissioning Authority and adjust units to achieve specified operation.

3.02 PARTICIPATION IN COMMISSIONING

- A. The Division 26 Contractor shall provide skilled technicians to startup and debug all systems within the Division 26 work (particularly with lighting equipment). These same technicians shall be made available to assist the Commissioning Authority in completing the commissioning program as it relates to each system and their technical specialty. Work schedules, time required for testing, etc., will be requested by the Commissioning Authority and coordinated by the Contractor. Contractor shall ensure the qualified technician(s) are available and present during the agreed upon schedules, and of sufficient duration to complete the necessary tests, adjustments, and/or problem resolutions.
- B. The Commissioning Authority reserves the right to judge the appropriateness and qualifications of the technicians relative to each item of equipment, system, and/or sub-system. Qualifications of technicians include expert knowledge relative to the specific equipment involved, adequate documentation, and tools to service/commission the equipment, and an attitude/willingness to work with the Commissioning Authority to get the job and work done. A liaison or intermediary between the Commissioning Authority and qualified factory representative does not constitute the availability of a qualified technician for purposes of this work.
- C. Provide skilled technicians to manipulate the following equipment and systems to be commissioned for functional testing:
 1. Power for mechanical systems.
 2. Lighting control systems.
 3. Daylighting control systems.
 4. Uninterruptible power systems.
 5. Access control & Video surveillance systems.

3.03 WORK TO RESOLVE DEFICIENCIES

- A. Maladjustments, misapplied equipment, and/or deficient performance under varying loads will result in a system that does not meet acceptable performance.

- B. Correction of work will be completed under the direction of the Project Representative, with input from the Contractor, Equipment Supplier, and Commissioning Authority.
- C. All members will have input and the opportunity to discuss, debate, and work out problems, and the Project Representative will have final jurisdiction on the necessary work to be done to achieve performance requirements.

3.04 SEASONAL COMMISSIONING AND OCCUPANCY VARIATIONS

- A. Seasonal commissioning pertains to testing under full-load conditions during peak heating and peak cooling seasons, as well as part-load conditions in the Spring and Fall. Initial commissioning will be done as soon as Contract work is completed regardless of the season. All equipment and systems will be tested and commissioned in a peak season to observe full-load performance. Heating equipment will be tested during winter design extremes. Cooling equipment will be tested during summer design extremes, with a fully occupied building. The Contractor will be responsible to participate in the initial and the alternate peak season test of the systems required demonstrating performance.
- B. Subsequent commissioning may be required under conditions of minimum and/or maximum occupancy or use. All equipment and systems affected by occupancy variations will be tested and commissioned at the minimum, and at peak loads to observe system performance. The Contractor will be responsible to participate in the occupancy sensitive testing of systems to provide verification of adequate performance.

3.05 ELECTRICAL SYSTEM TESTING

- A. Conform to Commissioning Requirements.
- B. Electrical system testing as required in other sections of this Specification shall be coordinated with the Commissioning Authority. The Commissioning Authority may witness testing performed by the Division 26 Contractor.
- C. All testing documentation related to Division 26 equipment and systems, as specified in other sections of this Specification, will be provided to the Commissioning Authority for use and review.
- D. Test wiring and electrical equipment to verify absence of grounds and short circuits, and verify proper operation, rotation, and phase relationships. Upon request, demonstrate operation of all equipment in accordance with the requirements of this Specification and the manufacturer's recommendations. Provide instruments and personnel required to conduct these tests.

3.06 CHECKS AND TESTS

- A. Checks are intended to begin upon completion of a component or equipment installation. Testing generally occurs later when systems are energized or nearing that point. Beginning system testing before full completion, does not relieve the Contractor from fully completing the system as soon as possible, including all construction checklists and may require retesting portions of the system once all components are fully functioning.
- B. The check and test procedures and record forms shall contain the following:
 - 1. The Subcontractor(s) executing checks and/or tests.
 - 2. A list of the integral components being inspected and tested, equipment tag numbers, manufacturer, model number, pertinent performance information/rating data.
 - 3. Test equipment used.
 - 4. Construction checklists associated with the components, if any.
 - 5. Any special required conditions of the checks or tests for each procedure.
 - 6. Items, conditions, or functions to be inspected, verified or tested, the checks and testing method given and a place provided with results recorded.
 - 7. Acceptance criteria (or reference by specific table where the acceptance criteria is found).
 - 8. For each procedure, list the technician performing the checks or tests and company, witnesses of the tests, and dates of tests.
 - 9. Sampling strategies used.
- C. The test procedures for dynamic equipment like lighting controls, emergency generator, or fire alarm system shall contain more step-by-step procedures. The test procedures and forms for more static components like panelboards, switchgear, circuit breakers, transformers, etc., can
- D. At the Commissioning Authority's discretion, if large numbers or repeated deficiencies are encountered, the Contractor shall test and troubleshoot all remaining systems at issue on their own before commissioning with the Commissioning Authority resumes.
- E. Sampling for Identical Units: When there are a number of identical units, at the Commissioning Authority's discretion, some or all procedures of a test for a piece of equipment or assembly may be omitted when these same tests on other pieces of identical equipment or assemblies were conducted without deficiency.

3.07 LOAD BALANCE

- A. Checks shall be made for proper load balance between phase conductors and make adjustments as necessary to bring unbalanced phases to within 15% of average load.
- B. Record all circuit changes on the As-Built Drawings.
- C. Do not fabricate nameplates, or coverplates' labelling, prior to load balance test and adjustments.

3.08 GROUNDING TEST

- A. Measure the Ohmic value of the existing electrical service entrance metallic “Electrical System Ground” with reference to “Earth Ground” using the “Multiple Ground Rod” method and suitable instruments. Maximum resistance to ground shall be less than 5 ohms. If this resistance cannot be obtained, notify the Project Representative in writing.
- B. Provide paper copy of the test results in the record O&M manuals.

3.09 EQUIPMENT SPECIFIC TESTING

- A. The following paragraphs define the testing requirements for each type of system or feature that is a part of this Project. The Commissioning Authority shall use this information to develop specific testing procedures for each of the systems to be commissioned. The Contractor shall be responsible for support, execution, and coordination of these tests as described in the Project Specifications, including intersystem tests and interlocks with systems in other Divisions.
- B. Common Testing Requirements:
 - 1. The following requirements apply to all electrical systems and features that are to be commissioned when referenced below. Tests shall:
 - a. Verify functionality and compliance for each individual sequence module in the sequences of operation. Verify proper operation of all control strategies, energy efficiency, and self-diagnostics, by stepping through each sequence and documenting equipment and system performance. Test every step in every written sequence and other significant modes, sequences, and operational features not mentioned in written sequences. These shall include: startup, normal operation, shutdown, scheduled on/off, unoccupied and manual modes, safeties, alarms, overrides, lockouts, and power failure.
 - b. Verify all alarm and high and low limit functions, and messages generated on all points with alarm settings.
 - c. Verify integrated performance of all components and control system components, including all interlocks and interactions with other equipment and systems.
 - d. Verify shutdown and restart capabilities both for scheduled and unscheduled events (e.g. power failure recovery and normal scheduled start/stop).
 - e. When applicable, demonstrate a full cycle from off to on and no load to full load and then to no load and off.
 - f. Verify time of day schedules and setpoints.
 - g. Verify all energy saving control strategies.
 - h. Verify that monitoring system graphics are representative of the systems and that all points and control elements are in the same location on the graphic as they are in the field.
 - i. Verify operator control of all commandable control system points including proper security level access.

- j. When testing procedures for commissioned equipment are listed in NETA Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems the NETA test procedures shall be part of the testing requirements of this Specification. Additional testing procedures may be listed in this Specification.
- C. Common Acceptance Criteria:
- 1. The following common acceptance criteria apply to all equipment, assemblies, and features:
 - a. For the conditions, sequences, and modes tested, the equipment, integral components, and related equipment shall respond to varying loads, and changing conditions, and parameters appropriately as expected, according to the sequences of operation, as specified, according to acceptable operating practices, and the manufacturer's performance specifications.
 - b. Verify that equipment operates within tolerances specified in: governing codes, acceptance criteria contained in construction documents, manufacturer's literature, and according to good operating practice.
 - c. Systems shall accomplish their intended function and performance.
 - d. All safety trips shall require a manual reset to allow a system restart.
 - e. Resetting a manual safety shall result in a stable, safe, and predictable return to normal operation by the system.
 - f. Safety circuits and permissive control circuits shall function in all possible combinations of selector switch positions (hand, auto, inverter, bypass, etc.)
 - g. Other acceptance criteria are given in the equipment testing requirement articles or reference standards.
 - h. Additional acceptance criteria will be developed by the Commissioning Authority when detailed test procedures are developed.
 - i. When testing procedures for commissioned equipment are listed in NETA Acceptance Testing Specifications for electric power distribution equipment and systems, the NETA performance criteria shall apply.

3.10 TRAINING

- A. The Division 26 Contractor will be required to participate in the training of the Owner's Engineering and Maintenance Staff for each electrical system and the related components. Training may be conducted in a classroom setting, with system and component documentation, and suitable classroom training aids, or in the field with the specific equipment. The type of training will be per the Owner's option.

END OF SECTION

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SECTION 26 24 16 PANELBOARDS

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, and Division 26.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that applies to work under this Specification.

1.02 SUMMARY

- A. Section Includes:
 - 1. Distribution Panelboards.
 - 2. Lighting and Appliance Branch-Circuit Panelboards.
 - 3. Electronic-Grade Panelboards.
- B. Panelboards: Furnish and install panelboards as specified herein and as shown on the Drawings.

1.03 DEFINITIONS

- A. ATS: Acceptance Testing Specification.
- B. GFCI: Ground-Fault Circuit Interrupter.
- C. GFEP: Ground-Fault Equipment Protection.
- D. HID: High-Intensity Discharge.
- E. MCCB: Molded Case Circuit Breaker.
- F. SPD: Surge Protective Device.
- G. VPR: Voltage Protection Rating.

1.04 REFERENCES

- A. NEMA PB 1 – Panelboards.
- B. NEMA PB 1.1 – Instructions for Safe Installation, Operation and Maintenance of Panelboards, Rated 600 Volts or Less.
- C. NEMA AB 1 – Molded Case Circuit Breakers.

- D. UL 50 – Enclosures for Electrical Equipment.
- E. UL 67 – Panelboards.
- F. UL 489 – Molded Case Circuit Breakers and Circuit Breaker Enclosures.
- G. CSA Standard C22.2 No. 29-M1989 – Panelboards and Enclosed Panelboards.
- H. CSA Standard C22.2 No. 5-M91 – Molded Case Circuit Breakers.
- I. Federal Specification W-P-115C – Type 1, Class 1.
- J. Federal Specification W-C-375B/Gen – Circuit Breakers, Molded Case, Branch Circuit and Service.
- K. NFPA 70 – National Electrical Code (NEC).
- L. ASTM – American Society of Testing Materials.

1.05 SUBMITTALS

- A. Submit under provisions of **Section 01 33 00 – Submittal Procedures**.
- B. Submit catalog cut sheets for all items proposed to be furnished and installed under this Section.
- C. Provide complete submittal information. Accepted documents shall include factory shop drawings, details, and wiring diagrams.
- D. Product Data: For each type of panelboard:
 - 1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
 - 2. Include dimensions and manufacturer's technical data on features, performance, electrical characteristics, ratings, and finishes.
- E. Shop Drawings: For each panelboard and related equipment:
 - 1. Provide shop drawings which contain overall panelboard dimensions, interior mounting dimensions, and wiring gutter dimensions. The location of the main, branches, and solid neutral shall be clearly shown. In addition, the drawing shall illustrate one-line diagrams with applicable voltage systems.
 - 2. Include dimensioned plans, elevations, sections, and details.
 - 3. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
 - 4. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
 - 5. Detail bus configuration, current, and voltage ratings.
 - 6. Short-circuit current rating (SCCR) of panelboards and overcurrent devices.

7. Include evidence of NRTL listing for series rating of installed devices.
8. Include evidence of NRTL listing for SPDs as installed in panelboards.
9. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, and auxiliary components.
10. Include wiring diagrams for power, signal, and control wiring.
11. Key interlock scheme drawing and sequence of operations.
12. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device. Include an Internet link for electronic access to downloadable PDF of the coordination curves.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Panelboard Schedules: For installation in panelboards. Submit and install final versions after load balancing.

1.07 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed that are packaged with protective covering for storage and identified with labels describing contents:
 1. Keys: 2 spares for each type of panelboard cabinet lock.
 2. Circuit Breakers, including GFCI and GFEP types: 2-spares for each panelboard.
 3. Fuses for Fused Switches: Equal to 10% of the quantity installed for each size and type, but no fewer than three (3) of each size and type.
 4. Fuses for Fused Power-Circuit Devices: Equal to 10% of the quantity installed for each size and type, but no fewer than three (3) of each size and type.

1.08 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For panelboards and components to include in operation and maintenance manuals. In addition to items specified in **Section 01 78 00 - Closeout Submittals**, include the following:
 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
 2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.
 3. Turn information over to the City of Tacoma project PM signed by both parties (COT and contractor).

1.09 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.
- B. Manufacturer Qualifications: **ISO 9001 or 9002** certified.

- C. Manufacturer shall have specialized in the manufacturing and assembly of panelboards for at least 50-years.
- D. Furnish products listed by Underwriters Laboratories (UL).
- E. The manufacturing facility shall be recognized by UL to the International Organization for Standardization ISO 9002 Series Standards for quality.
- F. Contractor shall be responsible to provide overcurrent protective devices, which selectively coordinate as required per Codes. Contractor shall be responsible to provide Overcurrent Protective Device Coordination Study per **Section 26 05 53 - Identification for Electrical Systems**.
- G. Contractor shall be responsible to provide arc-flash hazards labeling as required per Codes. Contractor shall be responsible to provide Arc-Flash Hazards Calculation per **Section 26 05 53 - Identification for Electrical Systems**.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Inspect and report concealed damage to carrier within their required time period.
- B. Remove loose packing and flammable materials from inside panelboards.
- C. Install temporary electric heating (250 W per panelboard) to prevent condensation.
- D. Handle and prepare panelboards for installation according to **NEMA PB 1**.
- E. Handle carefully to avoid damage to panelboard internal components, enclosure, and finish.
- F. Store in a clean, dry environment. Maintain factory packaging, and if required, provide an additional heavy canvas or heavy plastic cover to protect enclosure(s) from dirt, water, construction debris, and traffic.

1.11 OPERATIONS AND MAINTENANCE MANUALS

- A. Manufacturer shall provide installation instructions and NEMA Standards Publication PB 1.1 – Instructions for Safe Installation, Operation and Maintenance of Panelboards, rated 600 volts or less.

1.12 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 23 degrees F to plus 104 degrees F.
 - b. Altitude: Not exceeding 6,600 feet.

- B. Service Conditions: **NEMA PB 1**, usual service conditions, as follows:
 - 1. Ambient temperatures within limits specified.
 - 2. Altitude: Not exceeding 6,600 feet.
- C. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by the Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to the requirements indicated:
 - 1. Notify the Owner no fewer than 72 hours in advance of proposed interruption of electrical service.
 - 2. Do not proceed with interruption of electrical service without Owner's written permission.
 - 3. Comply with **NFPA 70E**.

1.13 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period:
 - 1. Panelboard Warranty Period: 18-months from date of Substantial Completion.
- B. Special Warranty: Manufacturer's standard form in which the manufacturer agrees to repair or replace SPDs that fail in materials or workmanship within specified warranty period.
 - 1. SPD Warranty Period: 5-years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Eaton Cutler-Hammer (basis of design).
- B. Siemens.
- C. Square D (Schneider Electric).
- D. Acceptance of the above manufacturers is contingent on their equipment size to be suitable for the installation situation and physical space indicated on the Drawings. Manufacturer shall verify this requirement.

2.02 PANELBOARDS COMMON REQUIREMENTS

- A. Load center type panelboards are not allowed.
- B. Comply with **NEMA PB 1**.
- C. Comply with **NFPA 70**.

- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.
- E. Product selection for restricted space. Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- F. Enclosures: Flush and surface mounted, dead-front cabinets:
 - 1. Maximum enclosure dimensions shall not exceed 21" wide and 6.5" deep and 84" high.
 - 2. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: **NEMA 250**, Type 1.
 - b. Outdoor Locations: **NEMA 250**, Type 3R or NEMA 250, Type 4X, stainless steel where indicated on plans.
 - 3. Type 3R and 4X:
 - a. Enclosures shall be constructed in accordance with UL 50 requirements. Enclosures shall be stainless steel.
 - b. All doors shall be gasketed and equipped with a tumbler type vault lock and two (2) additional quarter turn fasteners on enclosures 59 inches or more in height. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory cardholder shall be mounted on the inside of the door.
 - 4. Skirt for Surface Mount Panelboards: Same gauge and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
 - 5. Gutter Extension and Barrier: Same gauge and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
 - 6. Finishes:
 - a. Panels and Trim: Steel and galvanized steel, factory finish immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel and same finish as panelboards and trim.
 - c. Fungus Proofing: Permanent fungicidal treatment for overcurrent devices and other components.
- G. Interior:
 - 1. Shall be voltage and ampere rated, as indicated on associated schedules and drawings, not to exceed 600 amperes maximum.
 - 2. Short-circuit current ratings (SCCR) as specified on panel schedules. Ratings shall not be less than the following:
 - a. 22,000 rms symmetrical amperes at 240 VAC or 208 VAC.
 - b. 18,000 rms symmetrical amperes at 480 VAC.
 - 3. Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in

accordance with UL 67. Bussing rated 100-400 amperes shall be plated copper. Bussing rated for 600 amperes shall be plated copper as standard construction. Bus bar plating shall run the entire length of the bus bar. Panelboards shall be suitable for use as Service Equipment when application requirements comply with UL 67 and NEC Articles 230-F and –G.

4. Interiors shall be field convertible for top or bottom incoming feed. Main circuit breakers over 100 amps shall be vertically mounted. Main lug interiors up to 400 amps shall be field convertible to main breaker. Interior leveling provisions shall be provided for flush mount applications.

H. Incoming Mains:

1. Location: Top, Bottom, or Convertible between top and bottom as required.
2. Main Breaker: Main lug interiors up to 400 amps shall be field convertible to main breaker.

I. Phase, Neutral, and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.
 - a. Plating shall run entire length of bus.
 - b. Bus shall be fully rated the entire length.
2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors, bonded to the box.
4. Isolated Ground Bus: Adequate for branch-circuit isolated ground conductors, insulated from the box.
5. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from the enclosure. Do not mount neutral bus in gutter.
6. Extra-Capacity Neutral Bus: Neutral bus rated 200-percent of the phase bus and listed and labeled by an NRTL, acceptable to Authority Having Jurisdiction, as suitable for nonlinear loads in electronic-grade panelboards and others designated on the Drawings. Connectors shall be sized for double-sized or parallel conductors as indicated on the Drawings. Do not mount neutral bus in gutter.
7. Split Bus: Vertical buses divided into individual vertical sections.

J. Conductor Connectors: Suitable for use with conductor material and sizes:

1. Material: Hard-drawn copper, 98-percent conductivity.
2. Terminations shall allow use of 75-degree C rated conductors without derating.
3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required for larger conductors.
4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.

6. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
 7. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
 8. Gutter-Tap Lugs: Mechanical type, suitable for use with conductor material and with matching insulating covers. Locate at same end of bus as incoming lugs or main device.
 9. Extra-Capacity Neutral Lugs: Rated 200-percent of phase lugs, mounted on extra-capacity neutral bus.
- K. All current-carrying parts shall be insulated from ground and phase-to-phase by high dielectric strength thermoplastic.
- L. A solidly bonded copper equipment ground bar shall be provided. An additional copper isolated/insulated ground bar shall also be provided where indicated on the Panel Schedules in the Drawings.
- M. Split solid neutral shall be plated and located in the mains compartment up to 225 amps so all incoming neutral cable may be of the same length.
- N. Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed circuit breaker knock-outs covering unused mounting space.
- O. Future Devices: Panelboards shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices. Percentage of future space capacity shall be 20-percent minimum.
- P. NRTL Label: Panelboards shall be labeled by an NRTL acceptable to Authority Having Jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards shall have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.
- Q. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL Listed label and short-circuit current ratings shall all be displayed on the interior or in a booklet format.

2.03 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Panelboards: **NEMA PB 1**, lighting and appliance branch-circuit type.
- B. Mains: Circuit Breaker or Lugs only as shown on Drawings.
- C. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

- D. Contactors in Main Bus: **NEMA ICS 2**, Class A, electrically held, general purpose controller, with same SCCR as panelboard.
 - 1. Internal Control-Power Source: Control-power transformer, with fused primary and secondary terminals, connected to the main bus ahead of the contactor connection.
 - 2. External Control-Power Source: 120 volt branch-circuit.
- E. Column-Type Panelboards: Single row of overcurrent devices with narrow gutter extension and overhead junction box equipped with ground and neutral terminal buses.
- F. Doors: Door-in-Door construction with concealed hinges; secured with multi-point latch with tumbler locks; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed unless the outer door is open.

2.04 ELECTRONIC-GRADE PANELBOARDS

- A. Panelboards: **NEMA PB 1**; with factory-installed, integral SPD, labeled by an NRTL for compliance with UL 67 and UL 1449 after installing SPD.
- B. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
- C. Main Overcurrent Protective Devices: Bolt-on, thermal-magnetic circuit breakers.
- D. Branch Overcurrent Protective Devices: Bolt-on, thermal-magnetic circuit breakers.
- E. SPD:
 - 1. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than 100 kA. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.
 - 2. Protection modes and UL 1449 VPR for grounded wye circuits with 480Y/277V or 208Y/120V, three-phase, four-wire, circuits shall not exceed the following:
 - a. Line to Neutral: 1200 V for 480Y/277V and 700 V for 208Y/120V.
 - b. Line to Ground: 1200 V for 480Y/277V and 700 V for 208Y/120V.
 - c. Neutral to Ground: 1200 V for 480Y/277V and 700 V for 208Y/120V.
 - d. Line to Line: 2000 V for 480Y/277V and 1200 V for 208Y/120V.
 - 3. Protection modes and UL 1449 VPR for 240/120V, single-phase, three-wire, circuits shall not exceed the following:
 - a. Line to Neutral: 700 V.
 - b. Line to Ground: 700 V.
 - c. Neutral to Ground: 700 V.
 - d. Line to Line: 1200 V.
 - 4. SCCR: Equal to the SCCR of the panelboard in which installed.

5. Nominal Rating: 20 kA minimum.

F. Buses:

1. Copper phase and neutral buses: 200-percent capacity neutral bus and lugs.
2. Copper equipment and isolated buses.

2.05 OVERCURRENT PROTECTIVE DEVICES

A. Molded Case Circuit Breakers:

1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating, circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the Drawings.
2. Interrupting Capacity:
 - a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated in the Panel Schedules, but not less than:
 - 1) 22,000 rms symmetrical amperes at 240 VAC or 208 VAC.
 - 2) 18,000 rms symmetrical amperes at 480 VAC.
 - b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
3. Conductor Terminations:
 - a. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
5. Shall be molded case type circuit breakers, unless required to be electronic-trip for selective coordination.
6. Main circuit breakers shall have an overcenter, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40 degrees C ambient environment. Thermal elements shall be ambient compensating above 40 degrees C.
7. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
8. Provide listed switching duty rated circuit breakers with SWD marking for all branch circuits serving fluorescent lighting.
9. Provide listed high intensity discharge lighting rated circuit breakers with HID marking for all branch circuits serving HID lighting.
10. Do not use tandem circuit breakers.
11. Provide multi-pole circuit breakers for multi-wire branch circuits as required by **NFPA 70**.
12. Two- and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amps shall have a single magnetic trip adjustment located on the front of the circuit breaker that allows the user

- to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.
13. Breaker handle/faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL listed for reverse connection without restrictive line or load markings.
 14. Circuit breaker escutcheon shall have international I/O markings, in addition to standard ON/OFF markings. Circuit breaker handle accessories shall provide provisions for locking the handle in the ON or OFF position.
 15. Lugs shall be UL listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 90 degrees C rated wire, sized according to the 75 degrees C temperature rating per NEC Table 310-16. Lug body shall be bolted in place; snap-in designs are not acceptable.
 16. The circuit breakers shall be UL listed for use with the following accessories: Shunt-Trip, Under Voltage Trip, Ground Fault Shunt Trip, Auxiliary Switch, Alarm Switch, Mechanical Lug Kits, and Compression Lug Kits.

B. Main Circuit Breaker:

1. Shall be molded case type circuit breakers, unless required to be electronic-trip for selective coordination.
2. Main circuit breakers shall have an overcenter, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40 degrees C ambient environment. Thermal elements shall be ambient compensating above 40 degrees C.

C. Branch Circuit Breakers:

1. Circuit breakers shall be UL listed with amperage ratings, interrupting ratings, and number of poles as indicated on the associated Panel Schedules and Drawings.
2. Molded case branch circuit breakers shall have bolt-on type bus connectors.
3. Circuit breakers shall have an overcenter toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have thermal and magnetic trip elements in each pole. Two- and three-pole circuit breakers shall have common tripping of all poles.
4. There shall be two forms of visible trip indication. The breaker handle shall reside in a position between ON and OFF. In addition, there shall be a trip indicator appearing in the clear window of the circuit breaker housing.
5. The exposed faceplates of all branch circuit breakers shall be flush with one another.
6. Lugs shall be UL listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 90 degrees C rated wire, sized according to the 75 degrees C temperature rating per NEC Table 310-16. Branch circuit breakers rated 30 amps and below shall be UL listed to accept 60 degrees C rated wire.
7. Breakers shall be UL listed for use with the following factory installed accessories: Shunt Trip, Auxiliary Switch, and Alarm Switch.

2.06 ACCESSORIE, COMPONENTS, AND FEATURES

- A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device tests, inspections, maintenance, and operation.
- B. Portable Test Set: For testing functions of solid-state trip devices without removing from panelboard, include relay and meter test plugs suitable for testing panelboard meters and switchboard class relays.

2.07 IDENTIFICATION

- A. Provide labelling as required in **Section 26 05 53 - Identification for Electrical Systems**.
- B. Panelboard Labels: Manufacturer's name and trademark, voltage, amperes, number of phases, and number of poles shall be located on the interior of the panelboard door.
- C. Breaker Labels: Faceplates shall list current rating, UL and IEC certification standards, and AIC rating.
- D. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic cover.
 - 1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Comply with **NECA 1**.
- B. Install panelboards in accordance with manufacturer's written instructions, **NEMA PB 1.1**, and **NEC** Standards.
- C. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- D. For all new panelboards, provide minimum of four (4) additional 1-inch spare conduits with pull-strings from panelboard to above accessible ceiling for future circuits. Additionally, stub four (4) 1-inch spare conduits into raised floor space or below slab not on grade.

- E. Panelboard Mounting:
 - 1. Install panelboards on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in **Section 03 30 31 - Cast-in-Place Concrete**.
 - 2. Attach panelboard to the vertical finished or structural surface behind the panelboard.
 - 3. Mount top of trim 90-inches above finished floor, unless otherwise indicated.
 - 4. Mount panelboard cabinet plumb and rigid without distortion of the box.
 - 5. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
 - 6. Mount surface-mounted panelboards to steel slotted supports 5/8 inch or 1-1/4 inch, as required, in depth. Orient steel slotted supports vertically.
- F. Comply with manufactures mounting and anchoring requirements.
- G. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, brackets, and temporary blocking of moving parts from panelboards.
- H. Install overcurrent protective devices and controllers not already factory installed.
 - 1. Set field-adjustable, circuit breaker trip ranges.
 - 2. Tighten bolted connections and circuit breaker connections using a calibrated torque wrench or torque screwdriver per manufacturer's written instructions.
- I. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
- J. Arrange conductors in gutters into groups, bundle, and wrap with wire ties after completing load balancing.
- K. Install filler plates in unused spaces.
- L. Panel Schedules: Provide a typed index card of circuits, listing each circuit by proper designation, on back of each cabinet door under plastic cover. Spares and spaces to be entered in pencil. Panel Schedules shall be completed with specific (what and where) information.
- M. Labeling: Provide nameplate and labeling as required in **Section 26 05 53 - Identification for Electrical Systems**.
- N. Panels that are over-sprayed with wall paint must be cleaned and refinished. Otherwise, remove and replace equipment with new.
- O. Cleanup: After construction is complete, vacuum panels, equipment, cabinets, and switchboards to remove dust, rust, and debris.

3.02 FIELD QUALITY CONTROL

- A. Inspect complete installation for physical damage, proper alignment, anchorage, and grounding.
- B. Manufacturer's Field Service:
 - 1. Perform tests and inspections as required.
 - 2. Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations; including connections, and to assist in testing.
- C. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads within 20-percent of each other. Maintain proper phasing for multi-wire branch circuits.
- D. Check tightness of bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written requirements. Provide documentation of the torque connections to engineer for closeout documentation. If values do not match manufacturer recommendation, contractor to provide additional torqueing and provide documentation that the requirements have been adhered to.
- E. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test for low-voltage air circuit breakers and low-voltage surge arrestors stated in **NETA ATS**, Paragraph 7.6 "Circuit Breakers" and Paragraph 7.19.1 "Surge Arrestors", low-voltage. Perform optional tests. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After substantial completion, but not more than 60-days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Follow-Up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11-months after date of Substantial Completion.
 - c. Instruments and Equipment:
 - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device(s).
- F. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.

- G. Panelboards will be considered defective if they do not pass tests and inspections.
- H. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.03 PROTECTION

- A. Temporary Heating: Prior to energizing panelboards, apply temporary heat to maintain temperature according to manufacturer's written instructions.

3.04 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by the manufacturer.
- B. Set field-adjustable circuit breaker trip ranges as indicated or as shown in the Overcurrent Protective Device Coordination Study, where applicable.
- C. Load Balancing: After Substantial Completion, but not more than 60-days after Final Acceptance, measure load balancing and make circuit changes as required to keep phase loads within 20% of each other. Prior to making circuit changes to achieve load balancing, inform Owner's Representative of effect on phase color coding.
 - 1. Measure load during period of normal facility operations.
 - 2. Perform circuit changes to achieve load balancing outside normal facility operation schedule or at times directed by the Owner's Representative. Avoid disrupting services such as computers and on-line data processing, computing, transmitting and receiving equipment.
 - 3. After changing circuits to achieve load balancing, recheck loads during normal facility operations. Record load readings before and after changing circuits to achieve load balancing.
 - 4. Tolerance: Maximum difference between phase loads, within a panelboard, shall not exceed 20-percent.

3.05 IDENTIFICATION

- A. Comply with requirements in **Section 26 05 53 - Identification for Electrical Systems**.
- B. Identify field-installed conductors, interconnecting wiring, and components.
- C. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.

- D. Panelboard Nameplates: Label each panelboard with a nameplate.
- E. Device Nameplates: Label each branch circuit device in panelboards with a nameplate.
- F. Install warning signs and also identify source of remote circuits where applicable.

END OF SECTION

SECTION 26 27 17 EQUIPMENT WIRING

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, and Division 26.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that applies to work under this Specification.

1.02 SUMMARY

- A. Provide complete electrical connections to equipment.

1.03 REFERENCES

- A. NEMA WD 1 – General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2010).
- B. NEMA WD 6 – Wiring Devices – Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R2012).
- C. NFPA 70 – National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by the Authority Having Jurisdiction, Including all applicable amendments and supplements.

1.04 SUBMITTALS

- A. Submit under provisions of Division 01.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified, indicated, and intended.

1.06 GENERAL REQUIREMENTS

- A. Provide detailed wiring diagrams to interconnect components for complete operation of various electrical systems, including devices and components provided under other Sections of the Construction Documents.
- B. Provide layouts of equipment and details of mounting method for acceptance prior to installation to ensure proper execution of the Work.

- C. Drawings are diagrammatic and indicated generally the locations of materials and equipment, and shall be followed as closely as possible. Cooperate with other trades in order to make minor field adjustments to accommodate the work of others.
- D. All devices, outlets, cabinets, equipment, panels, light fixtures, and switches can be field located by Owner's Representative within 20-feet of designed locations prior to rough-in work without extra compensation.
- E. Coordinate electrical work with mechanical installations. Verify final mechanical equipment locations with mechanical installer prior to commencement of electrical work. Connect power wiring to mechanical equipment through starters, VFDs, and contactors as required. Maintain clearances around mechanical equipment to allow access for maintenance per NEC codes and local codes.
- F. Coordinate wiring interconnections for the complete operation of electrical-mechanical equipment to include items provided by other divisions. Examine equipment connection information with manufacturer's shop drawings and submittals.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Cords and Caps: **NEMA WD 6**; match receptacle configuration at outlet provide with equipment.
 - 1. Colors: Conform to **NEMA WD 1**.
 - 2. Cord Construction **NFPA 70**, Type SO, multi-conductor, flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
 - 3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
- B. Disconnect Switches: As specified in **Section 26 28 16 - Enclosed Switches** and in individual equipment sections.
- C. Wiring Devices: As specified in **Section 26 27 26 - Wiring Devices**.
- D. Raceways and Boxes: As specified in **Section 26 05 33 - Raceways and Boxes for Electrical Systems**.
- E. Wires and Cables: As specified in **Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables**.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

- A. Make electrical connections in accordance with equipment manufacturer's instructions.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connections in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Provide receptacle outlet(s) to accommodate connection(s) with attachment plug(s).
- E. Provide cord and cap where field-supplied attachment plug is required.
- F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- H. Install terminal block jumpers to complete equipment wiring requirements.
- I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

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SECTION 26 27 26 WIRING DEVICES

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, Division 26 and Division 28 when applicable.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that applies to work under this Specification.

1.02 SUMMARY

- A. Section Includes:
 - 1. Straight-blade convenience, hospital-grade, isolated-ground, and tamper-resistant receptacles.
 - 2. GFCI receptacles.
 - 3. Twist-lock receptacles.
 - 4. Cord and plug sets.
 - 5. Toggle switches.
 - 6. Wall plates and gaskets.

1.03 REFERENCES

- A. FS W-C-596 – Connector, Electrical, Power, General Specification for; Federal Specification; Revision G, 2001.
- B. FS W-S-896 – Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); Federal Specification; Revision F, 1999.
- C. NECA 1 – Standard for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2006.
- D. NEMA WD 1 – General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2010).
- E. NEMA WD 6 – Wiring Device – Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R 2012).
- F. NFPA 70 – National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by the Authority Having Jurisdiction, including all applicable amendments and supplements.
- G. UL 20 – General-Use Snap Switches; Current Edition, including all revisions.

- H. UL 498 – Attachment Plugs and Receptacles; Current Edition, including all revisions.
- I. UL 514D – Cover Plates for Flush-Mounted Wiring Devices; Current Edition, including all revisions.
- J. UL 943 – Ground-Fault Circuit-Interrupters; Current Edition, including all revisions.
- K. UL 1449 – Standard for Surge Protective Devices; Current Edition, including all revisions.
- L. UL 1472 – Solid-State Dimming Controls; Current Edition, including all revisions.
- M. UL 1917 – Solid-State Fan Speed Controls; Current Edition, including all revisions.

1.04 DEFINITIONS

- A. BAS: Building Automation System.
- B. EMI: Electromagnetic Interference.
- C. GFCI: Ground-Fault Circuit Interrupter.
- D. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- E. RFI: Radio-Frequency Interference.
- F. SPD: Surge Protective Device.
- G. UTP: Unshielded Twisted Pair.

1.05 SUBMITTALS

- A. Submit under provisions of **Section 01 33 00 – Submittal Procedures**.
- B. Submit catalog cuts for all items proposed to be furnished and installed under this Section.
- C. Product Data: For each type of product, provide manufacturer's catalog information showing dimensions, colors, and configurations.
 - 1. Wall Dimmers: Include derating information for ganged multiple devices.
 - 2. Surge Protection Receptacles: Include surge current rating, voltage protection rating (VPR), for all protection modes and diagnostics information.
- D. Shop Drawings: List of legends and description of materials and processes used for premarking wall plates.

- E. Samples: One for each type of device and wall plate specified, in each color specified.
- F. Project Record Documents: Record actual installed locations of all wiring devices.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of the Project:
 - 1. Screwdrivers for Tamper-Resistant Screws: Two of each type of screw.
 - 2. Extra Keys for Locking Switches: Two of each type.
 - 3. Extra GFC Protection Receptacles: Two of each type.
 - 4. Extra Wall Plates: One of each style, size, and finish.

1.06 INFORMATION SUBMITTALS

- A. Submit field quality-control reports.

1.07 CLOSEOUT SUBMITTALS

- A. Operating and Maintenance Data: For wiring devices to include in all manufacturer's packing label warnings and instruction manuals that include labeling conditions.

1.08 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.
- B. Manufacturer's Qualifications: Company specializing in manufacturing the products specified in this Section with minimum three (3) years documented experience.
- C. Provide products listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated for all wiring devices.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space, in original manufacturer's packaging until ready for installation.

1.10 COORDINATION

- A. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other Sections or by others.
- B. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
- C. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.

- D. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
- E. Notify Owner's Representative of any conflicts or deviations from the Contract Documents to obtain direction prior to proceeding with work.
- F. Do not install wiring devices until final surface finishes and painting are complete.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hubbell Incorporated: www.hubbell-wiring.com
- B. Leviton Manufacturing Company, Inc.: www.leviton.com
- C. Pass & Seymour, a brand of Legrand North America, Inc.: www.legrand.us
- D. Cooper Wiring Devices: www.cooperwiringdevices.com

2.02 APPLICATIONS

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
- C. Provide weather-resistant GFCI receptacles with specified weatherproof covers for all receptacles installed outdoors or in damp or wet locations.
- D. Unless noted otherwise, do not use combination switch/receptacle devices.

2.03 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Comply with **NFPA 70**.
- B. Wiring Devices, Components, and Accessories: Listed and labeled as defined in **NFPA 70**, by a qualified testing agency, and marked for intended location and application.
- C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
 - 1. Connectors shall comply with **UL 2459** and shall be made with stranding building wire.
 - 2. Devices shall comply with the requirements of this Section.

- D. Devices for Owner-Furnished Equipment:
1. Receptacles: match plug configurations.
 2. Cord and Plug Sets: match equipment requirements.
- E. Source Limitations: Obtain each type of wiring device and associated wall plate from a single source from a single manufacturer.

2.04 ACCEPTED PRODUCTS

DEVICE	LEVITON	HUBBELL	COOPER
1-POLE SWITCH	CSB1-20	1221	2221
3-WAY SWITCH	CSB3-20	1223	2223
4-WAY SWITCH	CSB4-20	1224	2224
DUPLEX RECEPTACLE	5362	5362	CR5362
DUPLEX GFCI RECEPTACLE	8899	GF5362	VGF20
DUPLEX TAMPER-RESISTANT RECEPTACLE	8200SG	GFR5362TR	TR8300

2.05 WALL SWITCHES

- A. Comply with **NEMA WD 1, NEMA WD 6, UL 20, and FS W-S-896.**
- B. All Wall Switches: AC only, quiet operating, general-use snap switches with silver alloy contacts; types as indicated on the Drawings.
1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
- C. Switches: 120/277 V, 20 amp rated, in the following configurations:
1. Single Pole.
 2. Two Pole.
 3. Three Way.
 4. Four Way.
 5. Pilot-Light.
 6. Key-Operated.
 7. Single-Pole, Double-Throw, Momentary-Contact, Center-Off: for use with mechanically held lighting contactors.
 8. Key-Operated, Single-Pole, Double-Throw, Momentary-Contact, Center-Off: for use with mechanically held lighting contactors, with factory-supplied key in lieu of switch handle.

2.06 STRAIGHT-BLADE RECEPTACLES

- A. All Receptacles: Self-grounding, complying with **NEMA WD 1**, and **NEMA WD 6**, and listed as complying with **UL 498**, and where applicable, **FS W-C-596**; types as indicated on the Drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring, and with separate ground terminal screw.
 - 2. NEMA configurations specified are according to **NEMA WD 6**.
- B. Single Receptacles: Heavy duty, grounding type, complying with **NEMA WD 1** and **WD 6**.
 - 1. Ratings: Match branch circuit and load characteristics.
- C. Duplex Receptacles: Heavy duty, specification grade, 20-ampere grounding type, 125 V, complying with **NEMA WD 1** and **WD 6**, configuration 5-20R, **UL 498**, and **FS W-C-596**.
 - 1. One piece integral all brass mounting strap with back wired grounding terminal.
 - 2. Back and side wired conductor terminals.
 - 3. External wiring clamps with #10 large head brass screws.
 - 4. NEMA Configuration: 5-20R.
- D. Hospital-Grade Duplex Convenience Receptacles: 125 V, 20 A; comply with **NEMA WD 1** and **WD 6**, configuration 5-20R, **UL 498**, and **FS W-C-596**.
- E. Isolated Ground Duplex Convenience Receptacles: 125 V, 20 A; comply with **NEMA WD 1** and **WD 6**, configuration 5-20R, **UL 498**, and **FS W-C-596**.
 - 1. Description: straight-blade, equipment grounding contacts shall be concealed only to the green grounding screw terminal of the device and with inherent electrical isolation from the mounting strap. Isolation shall be integral to the receptacle construction and not dependent on removable parts.
- F. Tamper-Resistant Duplex Convenience Receptacles: 125 V, 20 A; comply with **NEMA WD 1** and **WD 6**, configuration 5-20R, **UL 498**, and **FS W-C-596**.
 - 1. Description: Labeled and complying with **NFPA 70**, "Health Care Facilities", Article "Pediatric Locations" Section.

2.07 GFCI RECEPTACLES

- A. General Description:
 - 1. 125 V, 20 A, straight-blade, feed-through type.
 - 2. Comply with NEMA WD 1 and WD 6, configuration 5-20R, **UL 498**, **UL 943** Class A, and **FS W-C-596**.
 - 3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

2.08 TWIST-LOCKING RECEPTACLES

- A. Twist-Lock, Single Convenience Receptacles: 125 V, 20 A; comply with **NEMA WD 1** and **WD 6**, configuration L5-20R or as specified on the Drawings, and **UL 498**.
- B. Twist-Lock, Isolated-Ground, Single Convenience Receptacles: 125 V, 20A; comply with NEMA WD 1 and WD 6, configuration L5-20R or as specified on the Drawings, and UL 498.
 - 1. Grounding: Equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from the mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

2.09 CORD AND PLUG SETS

- A. Description:
 - 1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 - 2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with the green-insulating grounding conductor, and ampacity of at least 130-percent of the equipment rating.
 - 3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.10 COVER PLATES AND GASKETS

- A. All cover plates shall comply with **UL 514D**.
 - 1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
 - 2. Size: Standard or as otherwise indicated.
 - 3. Screws: Metal with slotted heads finished to match wall plate finish.
- B. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: 0.035-inch thick, satin finished, Type 302 Stainless Steel.
 - 3. Materials for Unfinished Spaces: Galvanized Steel.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- C. Wet-Location, Weatherproof Cover Plates: **NEMA 250**, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.
- D. Exterior Device Cover Plates: Wiring devices installed outdoors or wet areas shall be provided with hinged, gasketed, weatherproof covers.

- E. Exterior Receptacle Covers: Exterior receptacles covers shall be RED DOT WHILE-IN USE covers part # CKMUV for all exterior receptacles.

2.11 FINISHES

- A. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: White, or as selected by the Project Representative, or as otherwise indicated.
 - 2. Wiring Devices Connected to Emergency Power System: Red.
 - 3. SPD Devices: Blue.
 - 4. Isolated-Ground Receptacles: Orange or with Orange triangle on face.
- B. Cover Plate Color: For plastic covers, match device color, otherwise 302 stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Device or equipment mounting height given herein the Specifications, Drawings, and/or Contract Documents, are intended to provide general guidelines pursuant to industry standards. Such guidelines may not be exact or accurate and may or may not conflict with other trades installation without verification. Provide field coordination and verification with other divisions.
 - 1. Verify counter heights with cabinet installer and cabinet shop drawings, prior to rough-in for outlets.
 - 2. Examine other trades shop drawings to ensure that such mounting heights are appropriate for the intended device use, and the device locations do not conflict with other components. Immediately report impaired device use and conflict/location to the Owner's Representative for resolution. Devices may be moved up to 20-feet without additional compensation.
 - 3. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with **NFPA 70**.
- B. Verify that final surface finishes are complete, including painting.
 - 1. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

- C. The Drawings are diagrammatic and indicate generally the locations of materials, equipment, and devices. These Drawings shall be followed as closely as possible.
1. Coordinate the work under this Section with the Architectural, Structural, Plumbing, Heating and Air-Conditioning, and the drawings of other trades for exact dimensions, clearances, and roughing-in locations.
 2. Cooperate with other trades in order to make minor field adjustments to accommodate the work of others.
 3. Devices and outlets can be field located by Owner's Representative within 20-feet of the designed locations prior to rough-in work, without extra compensation.

3.03 INSTALLATION

- A. Comply with **NECA 1**, including mounting heights listed, unless otherwise indicated.
- B. Coordination with Other Trades:
1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint, unless the joint is troweled flush with the face of the wall.
 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of **NFPA 70**, Article 300, without pigtails.
 4. Existing conductors (where applicable):
 - a. Cut back and pigtail.
 - b. Replace all damaged conductors.
 - c. Straighten conductors that remain and remove corrosion and foreign matter.
 - d. Pigtail existing conductors is permitted, provided the outlet box is large enough.
- D. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- E. Install wall switches with OFF position down.

- F. Install two or more wiring devices shown in one location under a common cover plate. Install cover plates with edges in continuous contact with finished wall surfaces. Do not install more than one device in a single gang position.
- G. Before installation rough-in, device locations may be revised by the Owner's Representative within 20-feet of the designed contract location, at no additional cost.
- H. Device Installation:
 - 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package, or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 - 4. Connect devices to branch circuits using pigtails that are not less than 6-inches in length.
 - 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3s to 3/4s of the way around the terminal screw.
 - 6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
 - 7. When conductors larger than No. 12 AWG are installed on 15- or 20-amp circuits, splice No. 12 AWG pigtails for device connections.
 - 8. Tighten unused terminal screws on the device(s).
 - 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in the yokes, allowing metal-to-metal contact.
- I. Receptacle Orientation:
 - 1. Install ground pin of vertically mounted receptacles at the bottom, and on horizontally mounted receptacles to the right.
 - 2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.
- J. Device Cover Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- K. Cover Plate Gaskets: Place gasket over exposed outlet boxes flush with wall surface with device protruding through precut opening in seal. Fit cover plate over gasket and hold in place with plate-securing screws.
- L. Dimmer Switches:
 - 1. Install dimmer switches within terms of their listing.
 - 2. Verify that dimmer switches used for fan-speed control are listed for that application.

3. Install unshared neutral conductors on line and load side of dimmers according to manufacturer's device listing conditions in the written instructions.
- M. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on bottom. Group adjacent switches under single, multi-gang cover plates.
- N. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.04 GFCI RECEPTACLES

- A. Install non-feed through-type GFCI receptacles where protection of downstream receptacles are not required.

3.05 FIELD QUALITY CONTROL

- A. Perform field inspection, testing, and adjusting in accordance with Division 01.
- B. Inspect each wiring device for damage and defects.
- C. Operate each wall switch, dimmer switch, and fan speed controller with circuit energized to verify proper operation.
- D. Test each receptacle to verify operation and proper polarity.
- E. Test Instruments: Use instruments that comply with **UL 1436**.
- F. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital display indicators of measurement.
- G. Tests for Convenience Receptacles:
 1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-amp Load: A value of 6-percent or higher is unacceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

- H. Test straight-blade convenience outlets in patient-care areas for the retention force of the grounding-blade according to NFPA 99. Retention force shall not be less than 4 oz.
- I. Wiring devices will be considered defective if they do not pass tests and inspections.
- J. Correct wiring deficiencies and replace damaged or defective wiring devices.
- K. Prepare test and inspection reports.

3.06 ADJUSTING

- A. Adjust devices and cover plates to be flush and level.

3.07 IDENTIFICATION

- A. Comply with **Section 26 05 53 - Identification for Electrical Systems**.
- B. Identify each receptacle with panelboard and circuit number identification. Use hot, stamped, or engraved machine printing with black-filled lettering on face of cover plate, and durable wire markers or tags inside outlet boxes.

END OF SECTION

SECTION 26 28 13 FUSES

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, and Division 26.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that applies to work under this Specification.

1.02 SUMMARY

- A. Furnish and install fuses having the electrical characteristics, ratings, and modifications as specified herein and as shown on the Drawings.

1.03 REFERENCES

- A. NEMA FU 1 – Low-Voltage Cartridge Fuses; National Electrical Manufacturers Association; 2002 (R 2007).
- B. NFPA 70 – National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by the Authority Having Jurisdiction, including all applicable amendments and supplements.
- C. UL 248-1 – Low-Voltage Fuses – Part 1: General Requirements; Current Edition, including all revisions.

1.04 SUBMITTALS

- A. Submit under provisions of Division 01.
- B. Submit catalog cuts for all items proposed to be furnished and installed under this Section.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Bussman by Eaton:
<http://www.cooperindustries.com/content/public/en/products/fuses.html>

- B. Or other reviewed and accepted Manufacturers.

2.02 FUSES

- A. Comply with **UL 248-1**.
- B. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose indicated.
- C. Unless specifically indicated to be excluded, provide fuses for all fusible equipment as required for a complete operating system.
- D. Provide fuses of the same type, rating, and manufacturer within the same disconnect switch.
- E. Unless otherwise indicated, provide cartridge type fuses complying with **NEMA FU 1**, class and ratings as indicated.
- F. Voltage Rating: Suitable for circuit voltage.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that fuse ratings are consistent with circuit voltage and manufacturer's recommendations and nameplate data for equipment.
- B. Verify that conditions are satisfactory for the installation prior to starting work.

3.02 INSTALLATION

- A. Do not install fuses until circuits are ready to be energized.
- B. Provide fuses for equipment containing fuse-holders, including equipment furnished by other Divisions. Size motor branch circuit fuses in accordance with the rating of the motor served. Size fuses for equipment circuits in accordance with the branch circuit rating.
- C. Install fuses with label oriented such that manufacturer, type, and size are easily able to be read.
- D. Provide duplicate sets (3 fuses per set) of spare fuses of each type and rating at the completion of the Project.
- E. Furnish spare fuses in a spare fuse cabinet installed at a location directed by the Owner's Representative.

END OF SECTION

SECTION 26 28 16 ENCLOSED SWITCHES

PART 1 GENERAL

1.01 GENERAL

- A. Conform to General Conditions, Supplementary Conditions, Division 01, and Division 26.
- B. Review the Specifications and Drawings for coordination with additional requirements and information that applies to work under this Specification.

1.02 SUMMARY

- A. Furnish and installed the Enclosed Safety Switches having the electrical characteristics, ratings, and modifications as specified herein and as shown on the Drawings.

1.03 REFERENCES

- A. NECA 1 – Standard for Good Workmanship in Electrical Contracting; National Electrical Contractors Association; 2006.
- B. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum); 2008.
- C. NEMA KS 1 – Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum); National Electrical Manufacturers Association; 2001 (R 2006).
- D. NETA STD ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.
- E. NFPA 70 – National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, including all applicable amendments and supplements.
- F. UL 50 – Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, including all revisions.
- G. UL 50E – Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, including all revisions.
- H. UL 98 – Enclosed and Dead-Front Switches; Current Edition, including all revisions.

1.04 SUBMITTALS

- A. Submit under Provisions of **Section 01 33 00 - Submittal Procedures**.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.
- C. Project Record Documents: Record actual locations of installed enclosed switches.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of the manufacturer's instructions shall be included with the equipment at time of shipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Eaton Cutler-Hammer.
- B. Siemens.
- C. Square D (Schneider Electric).
- D. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features, and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will be considered only if accepted by the Project Representative.

2.02 ENCLOSED SAFETY SWITCHES

- A. Description: Quick-make, quick-break, enclosed safety switches complying with NEMA KS 1, type HD (heavy duty), and listed and labeled as complying with UL 98; ratings, configurations, and features as indicated on the Drawings.
- B. Provide products listed and labeled by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:

1. Altitude: Less than 6,000 feet (2,000 m).
 2. Ambient Temperature: Between -22 degrees F (-30 deg C) and 104 degrees F (40 deg C).
- D. Horsepower Rating: Suitable for connected load(s).
- E. Voltage Rating: Suitable for circuit voltage.
- F. Short-Circuit Current Rating:
1. Provide enclosed safety switches, when protected by fuses or supply side overcurrent protective devices to be installed, with listed short-circuit current rating (SCCR) not less than the available fault current at the installed location as indicated on the Drawings.
 2. Minimum Ratings: 18k AIC.
- G. Provide with switch blade contact position that is visible when the cover is open.
- H. Fuse Clips for Fusible Switches: As required to accept fuses indicated.
1. Where NEMA Class R fuses are installed, provide rejection feature to prevent installation of fuses other than Class R.
- I. Conductor Terminations: Suitable for use with the conductors to be installed.
- J. Provide insulated, groundable, fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.
- K. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
- L. Enclosures: Comply with **NEMA ICS 6**, **NEMA KS 1** and **NEMA 250**, and list and label as complying with **UL 50** and **UL 50E**.
1. Environment Type per **NEMA 250**: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor Clean, Dry Locations: **NEMA-1**.
 - b. Indoor Dirty/Dusty, Dry Locations: **NEMA-12**.
 - c. Outdoor and Indoor Wet Locations: **NEMA-3R** or **NEMA 4X** Stainless Steel where indicated on plans.
- M. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
- N. Heavy-Duty Switches:
1. Conductor Terminations:
 - a. Provide mechanical lugs unless otherwise indicated.
 - b. Provide compression lugs where indicated.
 - c. Lug Material: Copper, suitable for terminating copper conductors only.
 2. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

- O. Switches shall be equipped with the number of poles, voltage and current rating required for the equipment being served.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install enclosed switches in accordance with the manufacturer's instructions.
- B. Install enclosed safety switches securely, in a neat workmanlike manner and in accordance with **NECA-1**.
- C. Arrange equipment to provide minimum clearances in accordance with the manufacturer's instructions and **NFPA 70**.
- D. Provide required supports in accordance with **Section 26 05 29 - Hangers and Supports for Electrical Systems**.
- E. Install enclosed switches level and plumb.
- F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79-inches (2000 mm) above the floor or working platform.
- G. Provide grounding and bonding in accordance with **Section 26 05 26 - Grounding and Bonding**.
- H. Provide fuses complying with **Section 26 28 13 - Fuses** for fusible switches as indicated or as required by the equipment manufacturer's recommendations.
- I. Provide identification nameplate for enclosed switches in accordance with **Section 26 05 53 - Identification for Electrical Systems**.
- J. Provide identification label on inside door of each fused switch indicated NEMA fuse class, rating, and size. Install label in accordance with **Section 26 05 53 - Identification for Electrical Systems**.
- K. Provide arc flash warning labels in accordance with **NFPA 70E**.
- L. Provide disconnect switches as indicated on the Drawings, Schedules, at motors, motor driven equipment, motor controllers, electric heating equipment, appliances, and other equipment, unless the equipment has self-contained, code accepted disconnecting method.
- M. Mounting: Coordinate mounting location with equipment installation Contractor. In general, mounting height shall be 72-inches, maximum to top of switch.

3.02 FIELD QUALITY CONTROL

- A. Perform field inspections.
- B. Inspect and test in accordance with **NETA STD ATS**, except Section 4.
- C. Perform inspections and tests listed in **NETA STD ATS**, Section 7.5.1.1.
- D. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

3.03 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.04 CLEANING

- A. Clean dirt and debris from switch enclosure and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

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SECTION 26 56 00 EXTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior luminaires.
- B. Drivers.
- C. LEDs.
- D. Poles and accessories.
- E. Luminaire accessories.

1.02 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2015.
- B. NECA/IESNA 501 - Recommended Practice for Installing Exterior Lighting Systems; 2006.
- C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- E. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See **Section 01 33 00 - Submittal Procedures**.
- B. Shop Drawings:
 - 1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
- C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.

- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

1.04 QUALITY ASSURANCE

- A. Conform to requirements of **NFPA 70**.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Receive, handle, and store products according to **NECA/IESNA 501** and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.06 LIGHTING CONTROL DESIGN REQUIREMENTS

- A. Exterior photocells shall be provided integral to each fixture. See plans for specific fixture information.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

- A. Furnish products as indicated in luminaire schedule included on the drawings.

2.02 LUMINAIRES

- A. Provide products that comply with requirements of **NFPA 70**.
- B. Provide products that are listed and labeled as complying with **UL 1598**, where applicable.
- C. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. LED Luminaire Components: **UL 8750** recognized or listed as applicable.

2.03 DRIVERS

A. Dimmable LED Drivers:

1. Manufacturer Limitations: Where possible, provide ballasts/drivers produced by a single manufacturer.
2. Where a specific ballast/driver manufacturer or model is indicated elsewhere in the luminaire schedule or on the drawings, substitutions are not permitted unless explicitly indicated.
3. Dimming Range: Continuous dimming from 100 percent to one percent relative light output unless dimming capability to lower level is indicated, without flicker.
4. Control Compatibility: Fully compatible with the dimming controls to be installed.

B. General Requirements:

1. Designed for minimum 5 year operational life while operating at maximum case temperature and 90 percent non-condensing relative humidity.
2. Designed and tested to withstand electrostatic discharges without impairment when tested according to **IEC 61000-4-2**.
3. Maximum Inrush Current: 2 amperes for 120V and 277V drivers.
4. **UL 8750** recognized or listed as applicable.
5. Comply with **IEC 61347-2-13** as applicable.
6. Surge Tolerance: Designed and tested to withstand surges of 4,000 V according to **IEEE C62.41.2** without impairment of performance.
7. Manufactured in a facility that employs ESD reduction practices in compliance with **ANSI/ESD S20.20**.
8. Class A sound rating; Inaudible in a 27 dBA ambient.
9. No visible change in light output with a variation of plus or minus 10 percent line voltage input.
10. Total Harmonic Distortion (THD): Less than 20 percent; comply with **ANSI C82.11**.
11. Drivers to track evenly across multiple lamp lengths and all light levels.
12. Constant Current Drivers:
 - a. Support from 200 mA to 2.1 A (in 10 mA steps) to ensure a compatible driver exists.
 - b. Support LED arrays up to 40W or 50 W (710 mA to 1.05 A in 10 mA steps).
13. Constant Voltage Drivers:
 - a. Support from 10 V to 40 V (in 0.5 V steps) to ensure a compatible driver exists.
 - b. Support LED arrays up to 40W.

14. Configuration tool available to optimize the following for LED fixtures:
 - a. Light level.
 - b. Efficacy.
15. Thermal performance.

2.04 LEDS

- A. All LEDs:
 1. LED luminaires shall have LM79 and LM80 test reports.
 2. LED luminaires shall have lighting facts label.
 3. LED luminaires shall be energy star or DLC (Design Lights Consortium) rated.
 4. LED luminaires shall have a minimum CRI of 80.
 5. LED luminaires shall have minimum L70 life rating of 80,000 hours.
 6. LED luminaires shall have a minimum (5) warranty.

2.05 POLES

- A. All Poles:
 1. Provide poles and associated support components suitable for the luminaire(s) and associated supports and accessories to be installed.
 2. Material: As indicated on drawings.
 3. Shape: As indicated on drawings.
 4. Finish: Match luminaire finish, unless otherwise indicated.
 5. Mounting: Install on concrete foundation, height as indicated on the drawings, unless otherwise indicated.
 6. Unless otherwise indicated, provide with the following features/accessories:
 - a. Top cap.
 - b. Handhole.
 - c. Anchor bolts with leveling nuts or leveling shims.
 - d. Anchor base cover.
 - e. Provision for pole-mounted weatherproof GFI receptacle where indicated.

2.06 ACCESSORIES

- A. Provide accessory plaster frames for luminaires recessed in plaster ceilings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as shown on the drawings.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with **NFPA 70**.
- C. Verify that suitable support frames are installed where required.

- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Coordinate locations of outlet boxes provided under **Section 26 05 33 - Raceways and Boxes for Electrical Systems** as required for installation of luminaires provided under this section.
- B. Install products according to manufacturer's instructions.
- C. Install luminaires securely, in a neat and workmanlike manner, as specified in **NECA 1** (general workmanship) and **NECA/IESNA 501** (exterior lighting).
- D. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- E. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
- F. Pole-Mounted Luminaires:
 - 1. Grounding:
 - a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
 - 2. Install separate service conductors, 12 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.
- G. Install accessories furnished with each luminaire.
- H. Bond products and metal accessories to branch circuit equipment grounding conductor.
- I. Install lamps in each luminaire.

3.04 FIELD QUALITY CONTROL

- A. See **Section 01 40 00 - Quality Control Requirements**, for additional requirements.
- B. Inspect each product for damage and defects.

- C. Operate each luminaire after installation and connection to verify proper operation.
- D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Project Representative.

3.05 ADJUSTING

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Project Representative. Secure locking fittings in place.
- B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by Project Representative.

3.06 CLEANING

- A. Clean surfaces according to **NECA/IESNA 501** and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 PROTECTION

- A. Protect installed luminaires from subsequent construction operations.

3.08 SPARE FIXTURES

- A. Provide one spare fixture for each fixture type.

END OF SECTION

SECTION 28 13 00 ACCESS CONTROL & VIDEO MANAGEMENT SYSTEM

PART 1 GENERAL

1.01 SCOPE & RELATED DOCUMENTS

- A. The work covered by this Section of the Specifications includes the furnishing of all labor, equipment, materials, and performance of all operations in connection with the installation of the security access control system and Video Management system as shown on the drawings and as herein specified conform to General Conditions, Supplementary Conditions and Division 1.
- B. Security Contractor to coordinate all requirements with Architect Door Hardware Schedule and Specifications. PROVIDE NEW ACCESS CONTROL SYSTEM, VIDEO MANAGEMENT SYSTEM, DEVICES AND ALL CONNECTIONS REQUIRED FOR COMPLETE OPERATIONAL SYSTEM. Provide all equipment, power supplies, software, licenses, field devices, cabling, connections as required and indicated on the plans and these specifications.
- C. Security Contractor also to install and provide all connections for complete operation to owner furnished UniFi Network PoE switch, Fortinet Firewall Device and service compliant Modem for Internet Service to Rainier Connect.
- D. The requirements of the conditions of the Contract, Supplementary Conditions and General Requirements, apply to the work specified in this Section.
- E. The work covered by this Section of the Specifications shall be coordinated with the related work as specified elsewhere under the project specifications.

1.02 QUALITY ASSURANCE

- A. The manufacturers of all hardware and software components employed in the system shall be established vendors to the access control, video management , security monitoring industry for no less than 5-years and shall have successfully implemented at least (5) systems of similar size and complexity.

1.03 CONTRACTOR QUALIFICATIONS

- A. The security system integrator shall have been regularly engaged in the installation and maintenance of integrated access control systems including video management systems. They must have a proven track record with similar systems of the same size, scope, and complexity.
- B. The security system integrator shall supply information attesting to the fact that their firm is an authorized product integrator certified with the system. A minimum of (1) technician shall be a factory certified installer and meet the

following certifications, Genetec Security Center Enterprise, Omnicast and Synergis.

- C. The security system integrator shall supply information attesting to the fact that their installation and service technicians are competent factory trained and certified personnel capable of maintaining the system and providing reasonable service time.
- D. The security system integrator shall provide a minimum of (3) references whose systems are of similar complexity and have been installed and maintained by the security system integrator in the last 5-years.
- E. There shall be a local representative and factory authorized local service organization that shall carry a complete stock of parts and provide maintenance for these systems.
- F. Contractor shall be location and be within 50-miles of project site.
- G. Request for substitutions of equal for vendor and equipment must be received by the engineer in writing not later than 10-days prior to bid and will be evaluated and notes in the addenda for acceptance; refer to **Section 01 60 00 - Product Substitutions** for request for substitutions.

1.04 PRODUCT DATA SUBMITTAL

- A. Prior to assembling or installing the system, the Contractor shall provide the following:
 - 1. Complete product data and technical specification data sheets that include manufacturer's data for all material and equipment, including terminal devices, local processors, computer equipment, access cards, and any other equipment provided as part of the system.
 - 2. A system description, including analysis and calculations used in sizing equipment required by the system. The description shall show how the equipment shall operate as a system to meet the performance requirements of the system. The following information shall be supplied as a minimum:
 - a. Central processor configuration and memory size.
 - b. Description of site equipment and its configuration.
 - c. Protocol description.
 - d. Rigid disk system size and configuration.
 - e. Backup / archive system size and configuration.
 - f. Startup operations.
 - g. System expansion capability and method of implementation.
 - h. System power requirements and UPS sizing.
 - i. A description of the operating system and application software.
 - j. The contractor shall provide current state and factory trained certificates of technicians assigned for this project.

1.05 SHOP DRAWINGS SUBMITTAL

- A. Prior to assembling or installing the system, the Contractor shall provide complete shop drawings which include the following:
 - 1. Architectural floor plans indicating all system device locations.
 - 2. Full schematic wiring information for all devices. Wiring information shall include cable type, cable length, conductor routings, quantities, and point-to-point termination schedules.
 - 3. Provide one (1) banana cabling to each card reader location with future spare wiring. Refer to system plans for locations.
 - 4. Complete access control system one-line diagram.
 - 5. Statement of the system sequence of operation.
 - 6. Riser diagrams showing interconnections.
 - 7. Detail drawings showing installation and mounting.
 - 8. Fabrication drawings for console arrangements and equipment layout.
 - 9. Provide a final testing matrix for each device and blank space for IP and MAC addresses.
 - 10. The contractor shall provide current state and factory trained certificates of technicians assigned for this project.
- B. All drawings shall be fully dimensioned and prepared in DWG format using any CAD based software capable of exporting the format (such as AutoCAD).

1.06 AS-BUILT DRAWINGS

- A. At the conclusion of the project, the Contractor shall provide “as built” drawings. The “as built” drawings shall be a continuation of the Contractor’s shop drawings as modified, augmented, and reviewed during the installation, check out and acceptance phases of the project. All drawings shall be fully dimensioned and prepared in DWG format using any CAD based software capable of exporting the format (such as AutoCAD).
- B. Refer to **Section 01 78 00 - Closeout Submittals** for additional requirements.

1.07 O&M MANUALS

- A. At the conclusion of the project, the Contractor shall provide copies of the manuals as described herein. Each manual’s contents shall be identified on the cover. The manual shall include names, addresses, and telephone numbers of each security system integrator installing equipment and systems and the nearest service representatives for each item of equipment for each system. The manuals shall have a table of contents and labeled sections. The manuals shall include all modifications made during installation, checkout, and acceptance. The manuals shall contain the following:
 - 1. Functional Design Manual shall identify the operational requirements for the system and explain the theory of operation, design philosophy, and specific

- functions. A description of hardware and software functions, interfaces, and requirements shall be included for all system operating modes.
- a. Hardware Manual shall describe all equipment furnished including:
 - b. General description and specifications.
 - c. Installation and check out procedures.
 - d. Equipment layout and electrical schematics to the component level.
 - e. System layout drawings and schematics.
 - f. Alignment and calibration procedures.
 - g. Manufacturers repair parts list indicating sources of supply.
 2. Software Manual shall describe the functions of all software and shall include all other information necessary to enable proper loading, testing, and operation. The manual shall include:
 - a. Definition of terms and functions.
 - b. Use of system and applications software.
 - c. Initialization, startup, and shut down.
 - d. Alarm reports.
 - e. Reports generation.
 - f. Data base format and data entry requirements.
 - g. Directory of all disk files.
 3. Operators Manual shall fully explain all procedures and instructions for the operation of the system including:
 - a. Computers and peripherals.
 - b. System startup and shut down procedures.
 - c. Use of system, command, and applications software.
 - d. Recovery and restart procedures.
 - e. Graphic alarm presentation.
 - f. Use of report generator and generation of reports.
 - g. Data entry.
 - h. Operator commands.
 - i. Alarm messages and reprinting formats.
 - j. System access requirements.
 4. Maintenance Manual shall include descriptions of maintenance for all equipment including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components.
 5. Refer to **Section 01 78 00 - Closeout Submittals** for additional requirements

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. This system shall be an expansion of the existing Genetec Security Center platform which is the standard for the City of Tacoma Solid Waste Management.
- B. Genetec's Security Center platform consists of the both Synergis (Card Access) and Omnicast (video management system). This is the City of Tacoma standard.

2.02 ACCESS CONTROL & VIDEO MANAGEMENT SYSTEM FIELD HARDWARE

- A. The unified Genetec Security Center platform consisting of Access Control and Video Management systems will consist of the following field hardware: All field hardware must be designed to meet UL 294 and ULC requirements.
- B. Site A Location
1. Provide one Intelligent System Controller (ISC): Trove 1m1 with Altronix AL400ULXB2, ACM4CB, VR6 and Genetec LP1502 Mercury Master Controller. Trove Can dimensions are 18.00"H x 14.50"W x 4.62"D. All Genetec reader licenses are included in the Genetec LP1502 controller. Must be purchased by Genetec to get the licenses.
 2. Provide two HID card readers Signo 20 series
 3. Provide two HES1500 series electric strikes.
 4. Provide two Contact steel type with 1.25" gap, magnetic door contact switch. Potter Signal, AMS-26A or equal.
 5. Provide Three Genetec GTC-OM-P-1C camera connection licenses (one per camera)
 6. Provide One Stream Vault server 300 series with 8tb of storage. This SV300 will be a remote archiver for the video management system as well as the virtual cloud link appliance which is needed for the access control Synergis communication to the host system.
 7. Provide Three PTZ Cameras (Vicon model SN673V-C), Three wall mounts (Vicon model V670-HDB242-VS8) and Three pole mounts (Vicon model V670-HCM151)
- C. Site B Location
1. Provide one Intelligent System Controller (ISC): Trove 1m1 with Altronix AL400ULXB2, ACM4CB, VR6 and Genetec LP1502 Mercury Master Controller. Trove Can dimensions are 18.00"H x 14.50"W x 4.62"D. All Genetec reader licenses are included in the Genetec LP1502 controller. Must be purchased by Genetec to get the licenses.
 2. Provide one HID card reader Signo 20 series
 3. Provide one HES1500 series electric strikes.
 4. Provide one Contact steel type with 1.25" gap, magnetic door contact switch. Potter Signal, AMS-26A or equal.
 5. Provide Two Genetec GTC-OM-P-1C camera connection licenses (one per camera)
 6. Provide One Stream Vault server 300 series with 8tb of storage. This SV300 will be a remote archiver for the video management system as well as the virtual cloud link appliance which is needed for the access control Synergis communication to the host system.
 7. Provide Two PTZ Cameras (Vicon model SN673V-C), Three wall mounts (Vicon model V670-HDB242-VS8)

2.03 ACCESS CONTROL & VIDEO MANAGEMENT SOFTWARE

- A. Security Management System (SMS) Software: Genetec
- B. Provide all manufacture software licenses and fee as required for a minimum of one year.

2.04 GRAPHICAL USER INTERFACE (GUI)

- A. The security management system (system) shall employ a standard current Windows Professional, or later Graphical User Interface (GUI). A mouse and keyboard shall be the primary operator interface with the system. Operator screens shall utilize all standard Windows-style functions such as drop down menus, context menus, radio buttons, and lists, as appropriate. The interface shall utilize 'tree structure' similar to Windows Explorer.

2.05 ADMINISTRATION OPERATOR INTERFACE

- A. The system shall employ an Administration Operator Interface to control the following:
 - 1. Hardware (reader, inputs, output, video systems, door controls, CCTV, and other systems).
 - 2. Configuration of personnel records, operators and operator privileges.
 - 3. Graphical Maps.
 - 4. Application Layouts.
 - 5. Dynamic Views.
 - 6. Queries.
 - 7. Import / Export of objects, including images.
 - 8. System Variables.
 - 9. Reports (either periodic or one-time).
 - 10. System functions (event command and control, actions, schedules).
 - 11. Display of a list of objects in a grid which can have their values modified and respond to real time status changes.
 - 12. Scheduling of backups.
 - 13. Monitoring of system settings and performance.
 - 14. Designing of and printing of badges.
- B. The GUI shall be configurable by the system administrator to control the views and access of each monitoring station operator.

2.06 GRAPHIC MAPS

- A. The system shall support unlimited graphic maps and icons to be displayed on the operator workstation monitor.
- B. The system shall support an operator programmable, color graphic map display that:

1. Shall be capable of showing the floor plan, the location of alarm devices, and alarm instructions for a facility.
 2. Shall be centralized in the system configuration and displayed on the operators' workstations.
 3. Shall allow various maps to be associated with different areas to create a hierarchy of maps.
 4. Shall support graphic maps having a resolution of 1024 x 768 pixels or greater.
 5. Operator shall be able to use drag and drop mouse technique to place dynamic system level object icons of all objects such as: cameras, video servers, inputs / outputs, events, maps, reports, dynamic views, and door / elevator icons. These dynamic object icons shall allow a system operator to perform tasks and issue commands related to the object by double clicking on the icon.
- C. The system shall allow the addition of new layers to the drawing (such that if the drawing must ever be reloaded due to an update of the drawing). The layer(s) created within the system will be added back automatically without additional reconfiguration.
- D. The system shall be able to directly import the following file formats for the map:
1. AutoCAD (.DWG)
 2. DWF
 3. TIFF (.TIF)
 4. JPEG (.JPG)
 5. Windows Bitmap (.BMP)
 6. GIF
- E. The Maps feature shall include (2) operational modes: An administrative mode to allow configuring of the facility floor plans or site plans that show exterior features and a runtime mode to allow monitoring and interacting with the configured facility layouts or site plans. The Maps feature shall also include a tracking window, a magnification window, and a coordinate's window.

2.07 PRINTERS

- A. The system shall support report printing. The report printer(s) may be connected directly to the client PC, or shared over a network. The system shall support as report printer(s) any printer for which a printer driver exists within the current Windows operating systems.

2.08 WEB SERVICE SUPPORT FOR WIRED READER DEVICES

- A. The system shall provide web services to support wired reader devices.
- B. The system shall support integration to wired IP gateways and card readers without the requirement for additional field controller hardware. This integration shall support the following features:

1. 128-bit AES encryption.
2. Support for reader status messages.
3. The reader locks provide ADA compatibility for extended shunt times for any single or groups of physically impaired cardholders.
4. The reader shall support REX (Request to Exit) status that shall be reported separately from a normal access transaction. In the event that an attempt to exit is made, but the door / portal remains closed (secure) then the transaction shall not be recorded as a valid REX.
5. The reader / lock shall support an integral tamper switch.
6. The reader/ lock shall support and transmit a signal if the reader / lock batteries power drops below 10 %.
7. The reader / lock shall be able to operate in a fully stand-alone mode or as a distributed fully intelligent reader / lock holding the transactions until they are polled.
8. Portal gateways shall provide redundant communications capability.
9. The reader / lock shall be able to detect the presence of a cardholder planning to gain access, prior to the formal card presentation, such that the cardholder shall not be required to orient their card in a specific manner to wake up the reader.
10. User defined magnetic stripe formats on either track-2 or track-3 of the Magnetic Stripe tracks at standard bit coding densities at 2750 – 4000 Oersted.
11. Support for 125 KHz. HID / Wiegand-compatible proximity cards with variable bit formats such that multiple user defined bit formats can be supported at the reader.
12. Support for FIPS 201 contactless smart card.
13. Each reader lock capacity shall support a minimum of 2,000 ID's.

2.09 EVENTS

- A. The system shall support unlimited operator configurable events, including the scheduling of events, and action based trigger of events.
- B. The system shall provide (8) configurable event priority levels with a total of (200) numbered event priorities. The system shall allow the operator to define custom colors and labels per individual priority level.
- C. The system shall allow an event to be configured to:
 1. Be sortable by event name, date/time, priority, state, and any other displayable information.
 2. Be routed to operators by operator privileges, including support for the routing by time of day feature.
 3. Require or not require operator acknowledgment.
 4. Require or not require a log message to be entered by the system operator responding to the event.
 5. Display or not display the event activation.

6. Require the object(s) causing the event activation to reset before the operator may acknowledge the event.
7. Display an operator defined text message upon event activation.
8. Display an operator defined text message when the event is deactivated.
9. Be associated with a map so the map opens automatically on the monitoring station when the event activates.
10. Activate a second event when the first event activates and is unacknowledged for a specified period of time.
11. Allow the operator to associate an audio wave file with the event.
12. Allow for minimum activation time and delayed activation time for events.
13. Download events to the iSTAR controllers.
14. Run imports and exports.
15. Run reports and remove report results.

2.10 INTEGRATED E-MAIL

- A. The e-mail system shall have the ability to interface directly to an SMTP-compliant e-mail system supplied and configured by the user.

2.11 OBJECTS

- A. Each object within the system shall be addressed by a unique operator-defined name. Object names shall be unique within object types.
- B. The system shall provide the ability to add description text to each object definition.

2.12 REPORTS

- A. The system shall provide configurable data reports for database configuration, historical activity (Journal) and audit tracking. Pre-defined reports shall be available for download and import into the system.
- B. The system report function shall perform the following:
 1. Create reports about any object.
 2. Create report templates to simplify report design.
 3. Run reports on demand.
 4. Save report results for sharing between different users of the application.
 5. Export reports into formats such as PDF, RTF, TXT, TIFF, Excel (XLS), and MHTML.
 6. Specify a query to select and filter the records on which to report.
 7. Specify the data fields to be included in a report.
 8. Specify a design for the report layout.
 9. Design a report form to be used as a layout for headers / footers for multiple reports.
 10. Access and use system predefined report forms.
 11. Select tabular, multi-line, or free form report layouts.
 12. Report on objects linked together with parent / child relations.

13. Schedule reports to run automatically on a customized schedule.
14. Send exported report files to the printer or to external recipients via e-mail.

2.13 CABLING

- A. Security 4#18 AWG minimum cabling shall be provided by Electrical Contractor and trim by Access Control/Security Contractor.
- B. Access Control Banana cabling shall be provided by Electrical Contractor and trim by Access Control Contractor. Coordinate with Door Hardware Contractor for requirements and cable installations and connections.
- C. Access Control network cabling 4#18 AWG twisted/shielded between access controller power supplies. Verify exact locations of access control power supplies. Refer to electrical system plans.
- D. All Cat-6 cabling shall be test per Division 26 **Section 26 05 23 - Control-Voltage Electrical Power Cables**.
- E. All cable/wiring shall be Plenum-Rated unless otherwise stated. Or to code by Authority Having Jurisdiction.
- F. Exception to plenum-rated cable is underground-rated cable when cabling leaves the building. Provide protect per manufacture requirements.

2.14 RACEWAYS AND BOXES

- A. Contractor to provide all conduit, boxes and pathways for installation of Access Control and security systems by owner. Refer to Division 26 **Section 26 05 33 - Raceways and Boxes for Electrical Systems**. Refer to Electrical System Plans. Coordinate with Door Hardware Contractor.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide all equipment, wiring, required for the installation of a complete and operating system in accordance with applicable local, state and national codes, the manufacturer's recommendations, these plans and specifications. All circuits not in conduit must be wired with UL listed power limited cable under NEC 725 Class-II wiring. Plenum cable shall be utilized in all return air plenum ceilings. All other types of wiring must be in a separate conduit system. Color coded wires shall be used throughout. Wiring shall conform to the National Electrical Code Article 725.
- B. All equipment and wiring shall be guaranteed against defects in materials and workmanship for a 1-year period from the startup and beneficial use of the system. Warranty service for the equipment shall be provided by the system

supplier's factory trained representative during normal working hours, Monday through Friday, excluding Holidays. Emergency service provide at times other than as stipulated above shall be available from the same source at additional cost to the Owner.

- C. Installation of equipment and devices that pertain to other work in the Contract shall be closely coordinated with the appropriate Subcontractors.
- D. Coordinate requirements for network IP addresses with the Owner.
- E. Door Hardware Interface:
 - 1. Comply with requirements in **Section 08 70 00 - Entry Hardware** required to be monitored or controlled by the security access system, including request to exist devices and latch-bolt monitor devices.
 - 2. Match the electrical characteristics of controllers with the signal and power requirements of door hardware.
- F. Provide card readers, door position switches, power supplies and controllers and enclosures. Ground the system components as required. Nema enclosures provided under division 26 scope of work.
- G. Provide new magnetic door contact/sensors to the access control controller. Modify door frame to accommodate new contact/sensors.
- H. Provide a cable termination scheduled for cable and terminations installed under this Work. Coordinate schedule schema with Project Representative prior to commencement. Record cable schedules in an excel spreadsheet. Provide a copy of the spreadsheet on a CD to Owner prior to Project Close-out. Provide cable and wire to connect controllers, power supplies to the card readers, door hardware, request-to-exit devices and door position switches. Size cable and wire to maintain voltage drop and resistance. Levels acceptable to the manufacturer and for proper installation of the system.
- I. The Contractor shall clean all dirt and debris from the inside and the outside of the card access equipment after completion of the installation.

3.02 SYSTEM PROGRAMMING

- A. Coordinate and confirm with Owner door locking schedules and sequences.
- B. Program the access control system software doors.
- C. Coordinate programming requirements with the Owner to include the following.
 - 1. Door type grouping.
 - 2. Operating hours.
 - 3. Door alarm reporting.
 - 4. Door alarm shunting reset period.
 - 5. Staff type access to each doors.

- 6. Loss of power.
- D. Program and configure new devices into the existing Access Control System database. Coordinate number nomenclature and room number nomenclature with Owner prior to commencement.
- E. Program operational sequence of door to include the following at a minimum.
 - 1. Time of operation for securing doors.
 - 2. Time of operation for un-securing doors.
 - 3. Time-frame for door open in a non-alarm condition.
- F. Provide initial programming and configuration of the system including the definitions of the following.
 - 1. Hardware.
 - 2. Doors.
 - 3. Monitor points.
 - 4. Clearance codes.
 - 5. Time codes.
 - 6. Door groups.
 - 7. Alarm groups.
 - 8. Threat level management.
 - 9. Operating sequences.
- G. Develop and input system graphics, maps and standby screens using Architect provided floor plan. Development of maps shall include the creation of icons for all doors, monitor points, and tamper circuits.
- H. Maintain hard copy worksheets of the system program and configuration until final acceptance by Owner. Worksheets shall be subject to inspection and acceptance by Owner. Provide final copies to Owner prior to Project Close-out.
- I. Maintain electronic backups of the system configuration and cardholder database until final Acceptance by Owner. Provide back-up tapes at final acceptance.
- J. Approximately sixty (60) days after acceptance testing is complete, provide on-site follow-up assistance with system configuration. Include an allowance of two hours of labor for follow-up assistance in his Base Bid price.

3.03 SUPERVISION

- A. The manufacturer shall provide all on-site supervision of the installation, perform a complete functional test of the system and submit a written report to the Contractor attesting to the proper operation of the complete system.

3.04 TESTING

- A. The completed card access and video management system shall be fully tested by the Contractor in the presence of the Owner's representative. Upon completion of a successful test, the Contractor shall so certify in writing to the Owner and General Contractor with the following times in the report:

FIELD CONTROL TEST:

1. Provide a quality control and testing plan to the Project Representative a minimum of two weeks in advance of commence of the testing. Include tester credentials, and system test schedules and system test documentation templates.
 2. Manufacturer's Field Service: Engage a factory-authorized certification representative to inspect test, and adjust field-assembled components and equipment installation, including connections and to assist in field testing. Report results in writing.
 3. Provide a Final Testing Matrix for each device with IP and MAC addresses.
 4. Perform field inspections and operational test on each component or item of equipment and on the overall system. Minimum system testing shall include the following.
 - a. Operation of each card reader under the scheduled conditions.
 - b. Operation of each door under the scheduled conditions.
 - c. Operation of the system in a manual operation mode.
 - d. Reporting of doors in left open/alarm conditions.
 - e. Operation of the video management system.
- B. Upon completion of the installation, and after test and demonstration, the Electrical Contractor shall provide the Project Representative a signed written Statement of Completion.
- C. Provide all above documents in the close out documents.

3.05 INSTRUCTION

- A. The equipment manufacturer shall provide, as part of this contract, a minimum of two training sessions for programming and operation training to the City of Tacoma. Please factor two 2-hour training sessions.
- B. The manufacturer's representative shall conduct an instruction session during which all maintenance and operational aspects of the system will be described and demonstrated to personnel selected by the Owner. O&M Manual information regarding the system shall be turned over to the Project Representative prior to the scheduling of the training session. Provide one training session before final acceptance by City of Tacoma, after the system has been tested and inspected and after the Record Drawings and O&M Manuals have been completed and accepted. A second, follow-up training session shall be required 45-days after

occupancy by the District. This session will go over staff questions and system operation confirmation.

- C. Approximately sixty (60) days after occupancy, provide one 4-hour on-site follow-up training session for system operators with an agenda to be provided by the Owner ten (10) business days in advance.

3.06 WARRANTY

- A. The Contractor shall warrant the completed security system wiring and equipment to be free from inherent mechanical and electrical defects for a period of two 2-years from the date of the completed and certified test or from the date of first beneficial use.
- B. The Security System Integrator shall make available to the Owner a Maintenance Contract proposal to provide a minimum of two (2) inspections and test per year.

3.07 AS-BUILT DRAWINGS

- A. As-built drawings shall be provided by the Electrical Contractor which clearly indicates:
 - 1. Actual routing of all raceways.
 - 2. Actual cable type, color, number, and routing.
 - 3. Actual system wiring diagrams, connection diagrams and interface of all components in the system.
 - 4. Add to as-built drawings device IP and MAC addresses.
 - 5. Provide a final testing matrix for each device with IP and MAC addresses.
 - 6. Provide all the above documents in O&M manuals binders and one (1) binder for the City of Tacoma or as required per **Section 01 78 00 – Closeout Submittals**.

END OF SECTION

SECTION 31 11 00 CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for clearing, grubbing, and disposing of vegetation, including brushes, trees, stumps, roots, rubbish, refuse, trash, and debris within the indicated site limits shown on the Contract Drawings.

PART 2 PRODUCTS

2.01 MATERIALS, EQUIPMENT, AND FACILITIES

- A. Furnish materials, tools, equipment, facilities, and services required for performing tree removals, and site clearing and grubbing.

PART 3 EXECUTION

3.01 CLEARING AND GRUBBING

- A. Clear the site within the disturbance limits indicated on the Contract Drawings and remove cleared materials and debris from the site. Unless otherwise indicated, clearing and grubbing includes removal of all roots, grass, and debris from the existing ground.
- B. Remove stumps and roots completely in excavation areas.
- C. Coordinate the work of this Section with the work of **Section 02 41 00 - Demolition**, as required to remove existing pavements, curbs, and site improvements which interfere with the new construction and where demolition is not indicated.
- D. Disposal of Cleared Vegetation, Grubbed Material and Waste
 - 1. Dispose of in safe, acceptable manner, in accordance with applicable laws and ordinances.
 - a. Do not bury or burn trash and debris on the site.
 - b. Remove cleared vegetation, grubbed material and waste from the site at frequent intervals so that its presence will not delay the progress of the Work or cause hazardous conditions for workers and the public.
 - c. Removed materials, waste, trash, and debris shall become the property of the Contractor. Remove such materials from the Site and dispose of in a legal manner. It is the responsibility of the Contractor to locate disposal sites and determine length of haul routes.

2. Backfill: Backfill excavations resulting from work under this Section in accordance with applicable requirements of **Section 31 20 00 – Earth Moving**.

END OF SECTION

**SECTION 31 13 00
SELECTIVE TREE AND SHRUB REMOVAL AND TRIMMING**

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Section includes: This section includes general protection and removal of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.
1. Planting.
 2. Landscape Establishment.

1.02 DEFINITIONS

- A. The Protection Zone shall be defined as the area surrounding individual trees or groups of trees to be protected during construction, and is further defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated

1.03 SUBMITTALS

- A. Contractor shall provide product data for each type of product indicated.
- B. Contractor shall provide samples for each type of organic mulch in sealed plastic bags labeled with composition of materials by percentage of weight, protection zone fencing, and protection zone signage.
- C. Contractor shall provide a written Tree Pruning Schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
- D. Contractor shall provide certification from an arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that those trees were promptly and properly treated and repaired when damaged.
- E. Contractor shall provide maintenance recommendations from an arborist, for care and protection of trees affected by construction during and after completing the Work.
- F. Contractor shall provide documentation of existing trees and plantings indicated to remain, which shall establish preconstruction conditions that might be misconstrued as damage caused by construction activities.

1.04 QUALITY ASSURANCE

- A. Arborist shall be an arborist certified by ISA, be licensed arborist in the jurisdiction where Project is located, and be a current member of ASCA, or registered Consulting Arborist as designated by ASCA.
- B. Contractor shall conduct pre-installation conference at the project site.

1.05 PROJECT CONDITIONS

- A. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- B. Contractor shall not direct vehicle or equipment exhaust toward protection zones.
- C. Contractor shall prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch
- D. Contractor shall use bobcat type vehicles and equipment while doing site work on the Fireman's Park property.

PART 2 MATERIALS

2.01 LANDSCAPE MATERIALS

- A. Topsoil shall be:
 - 1. Natural or cultivated top layer of the soil profile or manufactured topsoil; containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch in diameter; and free of weeds, roots, and toxic and other non-soil materials.
 - 2. Stockpiled topsoil from areas cleared and grubbed or stripped from locations shown on Drawings or locations stripped as directed by the Utility.
- B. Organic Mulch shall be wood and bark chips, free from deleterious materials.
- C. Protection-Zone Fencing shall be fencing fixed in position and may be previously used materials when approved by the Utility.
 - 1. Plastic Protection-Zone Fencing shall be plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-

- inch maximum opening in pattern and supported by tubular or T-shape galvanized-steel posts spaced not more than 8 feet apart, and shall be non-fading high-visibility orange in color.
2. The height of the fencing shall be 4 feet.
- D. Protection-Zone Signage shall be shop-fabricated, rigid plastic or metal sheet with attachment holes pre-punched and reinforced; and legibly printed with non-fading lettering.

PART 3 EXECUTION

3.01 EXAMINATION & PREPARATION

- A. Contractor shall examine the site to verify that temporary erosion and sedimentation control measures are in place. Contractor shall verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones. Erosion and sedimentation control measures are to be as specified in **Section 31 25 00 Erosion and Sedimentation Control**.
- B. Contractor shall protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Contractor shall protect root systems from ponding, erosion, or excessive wetting caused by dewatering operations.
- C. Contractor shall mulch areas inside protection zones and other areas indicated with 4-inch average thickness of organic mulch. Do not place mulch within 6 inches of tree trunks.

3.02 ROOT PRUNING

- A. Contractor shall prune roots that are affected by temporary and permanent construction. Prune roots as follows:
 1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
 2. Temporarily support and protect roots from damage until they are permanently covered with soil.
 3. Cover exposed roots with burlap and water regularly.
 4. Backfill as soon as possible according to requirements in **Section 31 23 33 Trenching and Backfilling**.
- B. Contractor shall prune roots at the edge of Protection Zone by cleanly cutting all roots to the depth of the required excavation.
- C. Contractor shall prune roots within Protection Zone as follows:
 1. Clear and excavate by hand to the depth of the required excavation to minimize damage to root systems.
 2. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

3.03 CROWN PRUNING

- A. Contractor shall prune branches that are affected by temporary and permanent construction. Prune branches as follows:
 - 1. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.
 - 2. Prune trees according to **ANSI A300** Part 1 and the following:
 - a. Cut branches with sharp pruning instruments; do not break or chop.
 - b. Do not apply pruning paint to wounds.
- B. Contractor shall chip removed branches and dispose of all chipped material off-site.

3.04 REGRADING

- A. Where new finish grade is indicated below existing grade around trees, Contractor shall slope grade beyond the protection zone. Contractor shall maintain existing grades within the protection zone.
- B. Where new finish grade is indicated above existing grade around trees, Contractor shall slope grade beyond the protection zone. Contractor shall maintain existing grades within the protection zone.
- C. Where existing grade within the Protection Zone is 2 inches or less below elevation of finish grade, Contractor shall fill with topsoil. Contractor shall place topsoil in a single uncompacted layer and hand grade to required finish grade elevations.

3.05 FIELD QUALITY CONTROL

- A. Contractor shall engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.06 REPAIR AND REPLACEMENT

- A. Contractor shall repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by the City.
 - 1. Have arborist perform the root cutting, branch pruning, and damage repair of trees and shrubs.
 - 2. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
 - 3. Perform repairs within 24 hours.
 - 4. Replace vegetation that cannot be repaired and restored to full-growth status, as determined by the Utility.

END OF SECTION

SECTION 31 20 00 EARTH MOVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for earthwork, including excavation and placement of compacted fill, subgrade and foundation preparation; and finish grading.

1.02 REFERENCE STANDARDS

- A. The references listed below are a part of this Section. 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 listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
City of Tacoma	Standard Plans

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Material source, and all tests and certifications necessary to approve material, including moisture/density relation test results. If on-site material is proposed for use as any of the materials specified in construction, provide test results certifying suitability of said material. Sampling and tests for on-site material suitability shall be performed at least once for each Site and shall also be performed randomly at the request of the Project Representative.

1.05 QUALITY ASSURANCE

- A. Quality Control: Provide Quality Control to ensure compliance with specified requirements.
- B. Tests: Engage the City to coordinate and provide independent materials testing laboratory to perform tests. See Division 1 for requirements.

PART 2 PRODUCTS

2.01 GENERAL

- A. Crushed Surfacing shall be manufactured from ledge rock, talus, or gravel. The materials shall be uniform in quality and substantially free from wood, roots, bark, and other extraneous material and shall meet the following quality test requirements:
1. Los Angeles Wear, 500 Rev. 35 percent max.
 2. Degradation Factor – Top Course 25 min.
 3. Degradation Factor – Base Course 15 min.
- B. Crushed surfacing of the various classes shall meet the following requirements for grading and quality when placed in hauling vehicles for delivery to the roadway, or during manufacture and placement into a temporary stockpile. The exact point of acceptance will be determined by the Project Representative.

C.

	Base Course	Top Course
Sieve Size	Percent Passing	
1 1/4 "	99-100	
1 "	80-100	
3/4 "		99-100
5/8 "	50-80	
1/2 "		80-100
No. 4	25-45	46-66
No. 40	3-18	8-24
No. 200	7.5 max.	10.0 max.
% Fracture	75 min.	75 min.
Sand Equivalent	40 min.	40 min.

All percentages are by weight.

The fracture requirement shall be at least one fractured face and will apply to the combined aggregate retained on the No. 4 sieve shall not contain more than 0.15 percent wood waste.

- D. Materials for Bedding and Backfilling of utilities shall be in accordance with City of Tacoma Standard Plan No. SU-16.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Staking and Grading
1. Lay out the work, establish necessary markers, benchmarks, grading stakes, and other stakes as required, in accordance with the requirements specified in **Section 01 07 23 – Field Engineering**.

B. Existing Utilities

1. Verify on site the location and depth (elevation) of all existing utilities and services before performing excavation work. When excavating within three (3) feet of an active utility line, perform excavation by hand.
2. Immediately report the discovery of active utility lines which are not indicated in the Contract Documents to the Project Representative and utility owners involved. Allow the Project Representative and utility owners free access to determine the measures deemed necessary to repair, relocate, or remove the utility.

3.02 PREPARATION

- A. Erosion Protection: Refer to Contract Plans.
- B. Clear and Grub areas indicated on the Contract Drawings prior to earth moving operations in those areas. Refer to **Section 31 11 00 – Clearing and Grubbing**.
- C. Perform demolition in accordance with **Section 02 41 00 – Demolition**, prior to earth moving operations in those areas.

3.03 CONSTRUCTION

- A. **Equipment:** All equipment necessary for the satisfactory performance of this construction shall be on the project and approved by the Project Representative prior to beginning work. If central mix plant methods are used, the central mixing plant shall comply with the following requirements:
1. The cold aggregate feeder shall be mechanically operated and adjustable to the extent necessary to provide a uniform and continuous flow of materials. These materials shall be deposited in an approved mixer with a sufficient amount of water being added to obtain the required density when spread and compacted. The water shall be weighed or metered, and dispensed through a device providing uniform dispersion across the mixer.
 2. The mixing plant shall be provided with weighing or calibrating devices, feeders, provisions for sampling, and other devices and equipment so designed, coordinated, and operated to produce a uniform mixture, and to permit the sampling of the materials before and after mixing. The mixer shall be kept in good condition, and mixing blades or paddles shall be of proper size, adjustment, and clearance to provide positive and uniform mixing of the mixture at all times.
 3. The capacity of the plant and equipment furnished for the Work shall be adequate at all times to provide for efficient and continuous operations insofar as practical.
- B. **Subgrade for Surfacing:** In preparing the Roadbed for surfacing, the Contractor shall:
1. Remove from the Roadbed, immediately before placing surfacing materials, all brush, weeds, vegetation, grass, and other debris.
 2. Dispose of all debris as the Project Representative directs.

3. Drain water from all low spots or ruts.
4. Shape the entire Subgrade to a uniform surface running reasonably true to the line, grade, and cross-section as staked.
5. If necessary, the Contractor shall process the Subgrade in cut areas to remove materials too coarse for mechanical trimming and re-compaction.
6. Compact the Subgrade to a depth of 6 inches. Compaction shall achieve 95 percent of the maximum density determined under the tests performed by the City. If the underlying material is too soft to permit proper compaction of the Subgrade, the Contractor shall loosen, aerate (or excavate and remove), and compact the Subgrade until the top layer can be compacted as required.
7. Remove excess material that does not drift to low spots during grading and shaping. The Contractor shall dispose of this excess by placing it where the Subgrade lacks material or by wasting it, as the Project Representative directs.
8. Add materials as the Project Representative directs where the Subgrade needs more to bring it up to grade. The Contractor shall water and compact these added materials as needed to produce a true finished Subgrade.

C. **Mixing:** Unless otherwise specified, the Contractor may use either, or both, of the following described methods:

1. Central Plant Mix Method – The surfacing material and water shall be mixed in an approved mixing plant. The completed mixture shall be a thoroughly mixed combination of proportioned materials and water, uniform in distribution of particle sizes and moisture content. A mixture containing water in excess of the proportion established by the Project Representative will not be accepted.
2. Road Mix Method – After material for each layer of surfacing has been placed, the material shall be mixed until uniform throughout by motor graders or other equipment approved by the Project Representative. Water to facilitate mixing and compacting shall be added in amounts approved by the Project Representative.

D. **Placing and Spreading**

1. Central Plant Mix Method – After mixing, material for each layer of surfacing shall be transported to the Roadway in approved vehicles. Vehicles for hauling the mixture shall be capable of depositing the mixture within the receiving hopper of the spreading equipment, or in windrows of uniform size in front of the spreading equipment, with a minimum of segregation of the mix. A motor grader may be used as the spreading machine or the spreading machine shall be capable of receiving the material by direct deposit in its hopper from the hauling vehicle or from a uniform windrow, and be capable of spreading and screeding the material to a depth and surface that when compacted will be true to line, grade, depth of course, and cross-section without further shaping.
2. Road Mix Method – Each layer of surfacing material shall be spread by equipment that is approved by the Project Representative. Equipment that causes segregation of the surfacing material during the spreading operation will not be allowed. Similar types of spreading equipment shall be used

throughout the limits of each separate spreading operation. Spreading on small areas of less than 2,000 square yards or on areas irregular in shape, may be accomplished by other means as approved by the Project Representative. The following nominal depth of compacted material shall not be exceeded in any one course without the approval of the Project Representative:

- a. Ballast 0.50 foot
- b. Gravel Base 0.75 foot
- c. Crushed Surfacing 0.35 foot

- E. **Shaping and Compaction:** Immediately following spreading and final shaping, each layer of surfacing shall be compacted to at least 95 percent of maximum density before the next succeeding layer of surfacing or pavement is placed. The determination of field in-place density shall be made by the Nuclear gauge. When the thickness of surfacing is less than 0.15 foot, density testing will not be required and the Project Representative will determine the number of coverages required for the particular compaction equipment available. Vibratory compactors and rollers shall obtain the specified density for each layer. A mist spray of water shall be applied as needed to replace moisture lost by evaporation. The completed layer shall have a smooth, tight, uniform surface true to the line, grade, and cross-section shown in the Plans, or as staked.
- F. **Weather Limitations:** When, in the opinion of the Project Representative, the weather is such that satisfactory results cannot be obtained, the Contractor shall suspend operations until the weather is favorable. No surfacing materials shall be placed in snow or on a soft, muddy, or frozen Subgrade.

END OF SECTION

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SECTION 31 23 33 TRENCHING AND BACKFILLING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for excavating, trenching, and backfilling for utilities and related structures including underground piping for water supply, sanitary sewer pipe, and catch basins.

1.02 REFERENCE STANDARDS

- A. The references listed below are a part of this Section. 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 listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
City of Tacoma	Standard Plans

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Compaction Testing Requirements per **City of Tacoma Standard Plan No. SU-28.**

PART 2 PRODUCTS

2.01 GENERAL

- A. Materials for Bedding and Backfilling of storm and sewer utilities shall be in accordance with **City of Tacoma Standard Plan No. SU-16.**
- B. Materials for Bedding, and Backfilling of water utilities shall be:
1. Gravel Backfill for Pipe Zone Bedding shall consist of crushed, processed, or naturally occurring granular material. It shall be free from various types of wood waste or other extraneous or objectionable materials. It shall have such characteristics of size and shape that it will compact and shall meet the following Specifications for grading and quality:

Sieve Size	Percent Passing
1 ½ "	99-100
1 "	75-100
5/8 "	50-100
No. 4	20-80
No. 40	3-24
No. 200	10.0 max.
Sand Equivalent	35 min.

All percentages are by weight.

If, in the opinion of the Project Representative, the native granular material is free from wood waste, organic material, and other extraneous or objectionable materials, but otherwise does not conform to the Specifications for grading and Sand Equivalent, it may be used for pipe bedding for rigid pipes, provided the native granular material has a maximum dimension of 1½ inches.

2. Pipe Zone Backfill and Trench Backfill shall consist of granular material, either naturally occurring or processed. It shall be essentially free from various types of wood waste or other extraneous or objectionable materials. It shall have such characteristics of size and shape that it will compact readily, and the maximum particle size shall not exceed ⅔ of the depth of the layer being placed. Gravel base shall meet the following requirements for grading and quality when placed in hauling vehicles for delivery to the roadway or during manufacture and placement into a temporary stockpile. The exact point of acceptance will be determined by the Project Representative.

Sieve Size	Percent Passing
2 ½ "	100
2 "	75-100
No. 4	22-100
No. 200	0-10
Dust Ratio:	2/3 max.
Sand Equivalent	30 min.

All percentages are by weight.

Gravel base material retained on a No. 4 sieve shall not contain more than 0.20 percent by weight of wood waste.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. Construction requirements for trenching and backfilling for utilities and related structures shall be in accordance with **City of Tacoma Standard Plan No. SU-16 and No. SU-28.**

END OF SECTION

SECTION 32 12 16 ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for providing and placing plant-mixed Hot Mix Asphalt (HMA) on a prepared base in accordance with the lines, grades, thicknesses, and typical cross sections noted on the Contract Drawings.

1.02 REFERENCE STANDARDS

- A. The references listed below are a part of this Section. 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 listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
Washington State Department of Transportation (WSDOT)	Standard Specifications for Road, Bridge, and Municipal Construction 2022 Edition

1.03 DEFINITIONS

- A. Hot Mix Asphalt (HMA): A plant-mixed asphalt concrete pavement composed of asphalt binder and mineral aggregate mixed in specified proportions at a predetermined temperature to provide a homogenous, stable, workable, and compactable mixture.

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Mix Design.
- C. Paving Plan for areas under traffic.
- D. Test Reports: Submit test results of sampling and testing, and inspection records within 24 hours of asphalt concrete placement.

PART 2 PRODUCTS

2.01 GENERAL

- A. HMA used in the project shall be HMA Cl. ½" PG 58H-22.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. **Weather Limitations:** Do not place HMA for wearing course on any Traveled Way beginning October 1st through March 31st of the following year, without written concurrence from the Project Representative. Do not place HMA on any wet surface, or when the average surface temperatures are less than those specified in Table 1, or when weather conditions otherwise prevent the proper handling or finishing of the HMA.

Table 5 Minimum Surface Temperature for Paving

Compacted Thickness (feet)	Wearing Course	Other Courses
Less than 0.10	55°F	45°F
0.10 to 0.20	45°F	35°F
More than 0.20	35°F	35°F

- B. **Paving Under Traffic:** These requirements apply when the Roadway being paved is open to traffic. In hot weather, the Project Representative may require the application of water to the pavement to accelerate the finish rolling of the pavement and to shorten the time required before reopening to traffic. During paving operations, maintain temporary pavement markings throughout the project.
- C. **Preparation of Existing Paved Surfaces:** Before constructing HMA on an existing paved surface, the entire surface of the pavement shall be clean. Entirely remove all fatty asphalt patches, grease drippings, and other deleterious substances from the existing pavement to the satisfaction of the Project Representative. Thoroughly clean all pavements or bituminous surfaces of dust, soil, pavement grindings, and other foreign matter. Thoroughly remove any cleaning or solvent type liquids used to clean equipment spilled on the pavement before paving proceeds. Fill all holes and small depressions with an appropriate class of HMA. Level and thoroughly compact the surface of the patched area.

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

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

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

- D. **Spreading and Finishing:** Do not exceed the maximum nominal compacted depth of any layer in any course, as shown in Table 6, unless approved by the Project Representative:

Table 6 Maximum Nominal Compacted Depth of Any Layer

HMA Class	Wearing Course	Other than Wearing Course
1 inch	0.35 feet	0.35 feet
$\frac{3}{4}$ and $\frac{1}{2}$ inch	0.30 feet	0.35 feet
$\frac{3}{8}$ inch	0.25 feet	0.30 feet

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

END OF SECTION

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SECTION 32 16 13 CONCRETE CURBS AND GUTTERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for providing cement concrete curb and gutters and valley gutters in accordance with the Contract Documents.

1.02 REFERENCE STANDARDS

- A. The references listed below are a part of this Section. 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 listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
City of Tacoma	Standard Plans

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Concrete Mix Design: Submit concrete mix design and test results.

PART 2 PRODUCTS

2.01 GENERAL

- A. Cement concrete curb and gutter and valley gutter shall be constructed with air entrained concrete Class 4000.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. Cement Concrete Traffic Curb & Gutter in accordance with **City of Tacoma Standard Plan No. SU-03 Cement Concrete Curb and Gutter.**

- B. Cement Concrete Valley Curb in accordance with detail shown in the Contract Drawings.
- C. The foundation for curbs, gutters, and valley gutters shall be thoroughly compacted and required side forms shall rest throughout their length on firm ground. Side forms for straight sections shall be full depth of the curb. They shall be either metal of suitable gage for the Work or surfaced "construction" grade lumber not less than 2 inches (commercial) in thickness. Forms used more than one time shall be thoroughly cleaned and any forms that have become worn, splintered, or warped shall not be used again.
- D. The foundation shall be watered thoroughly before the concrete is placed, and the concrete shall be well tamped and spaded or vibrated in the forms. The exposed surfaces shall be finished full width with a trowel and edger. Within 24 hours after the concrete is placed, the forms of the Roadway face of curbs shall be removed, and the concrete treated with a float finish. The top and face of the curb shall receive a light brush finish, and the top of the gutter shall receive a broom finish.
- E. Expansion joints in the curb or curb and gutter shall be spaced as shown in the Plans, and placed at the beginning and ends of curb returns, drainage Structures, bridges, and cold joints with existing curbs and gutters. The expansion joint shall be filled to full cross-section with $\frac{3}{8}$ -inch premolded joint filler. When curb or curb and gutter is placed adjacent to portland cement concrete pavement, a $\frac{3}{8}$ -inch thick, 6 inch deep premolded joint filler shall be installed between the two vertical surfaces to prevent cracking.
- F. The concrete shall be cured for 72 hours.
- G. At the option of the Contractor, the curb and gutter may be constructed using approved slip-form equipment. The curb and gutter shall be constructed to the same requirements as the cast-in-place curb and gutter.

END OF SECTION

SECTION 32 16 23 SIDEWALKS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for providing cement concrete sidewalks, cement concrete curb ramps with detectable warning surfaces, and cement concrete access ramps as shown in the Contract Drawings.

1.02 REFERENCE STANDARDS

- A. The references listed below are a part of this Section. 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 listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
City of Tacoma	Standard Plans

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Concrete Mix Design: Submit concrete mix design and test results.

PART 2 PRODUCTS

2.01 GENERAL

- A. The concrete in the sidewalks and curb ramps shall be air entrained concrete Class 3000.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. The Contractor shall request a pre-meeting with the Project Representative to be held 2 to 5 calendar days before any work can start on cement concrete

sidewalks, curb ramps or other pedestrian access routes to discuss construction requirements. Those attending shall include:

1. The Contractor and Subcontractor in charge of constructing forms, and placing, and finishing the cement concrete.
2. Project Representative and Project Inspectors for the cement concrete sidewalk, curb ramp or pedestrian access route Work.

B. Items to be discussed in this meeting shall include, at a minimum, the following:

1. Slopes shown on the Plans.
2. Inspection
3. Traffic control
4. Pedestrian control, access routes and delineation
5. Accommodating utilities
6. Form work
7. Installation of detectable warning surfaces
8. Contractor ADA survey and ADA Feature as-built requirements
9. Cold Weather Protection

C. Cement Concrete Sidewalk shall be installed per **City of Tacoma Standard Plan No. SU-04 Cement Concrete Sidewalk**.

D. Cement Concrete Curb Ramps shall be installed per **City of Tacoma Standard Plan No. SU-05 Curb Ramp Details General Information, SU-05A Perpendicular Curb Ramp Type 'A', SU-05C Combination Curb Ramp, SU-05G Detectable Warning Surface Details**, and per details shown on the Contract Drawings.

E. The detectable warning surface shall be located as shown in the Contract Drawings or Standard Plans. Placement of the detectable warning surface shall be in accordance with the manufacturer's recommendation for placement in fresh concrete, before the concrete has reached initial set, or on a hardened cement concrete surface. Glued or stick down detectable warning surfaces are allowed on asphalt surfaces only for temporary work zone applications.

F. Excavation shall be made to the required depth and to a width that will permit the installation and bracing of the forms. The foundation shall be shaped and compacted to a firm even surface conforming to the section shown in the Plans. All soft and yielding material shall be removed and replaced with acceptable material.

G. Forms shall be of wood or metal and shall extend for the full depth of the concrete. All forms shall be straight, free from warp, and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal. After the forms have been set to line and grade, the foundation shall be brought to the grade required and thoroughly wetted approximately 12 hours before placing the concrete.

- H. The concrete shall be placed in the forms and struck off with an approved straightedge. As soon as the surface can be worked, it shall be troweled smooth with a steel trowel. After troweling and before installing the contraction joints or perimeter edging, the walking surfaces of the sidewalk and curb ramps shall be brushed in a transverse direction with a stiff bristled broom
- I. Expansion and contraction joints shall be constructed as shown City of Tacoma Standard Plans. When the sidewalk abuts a cement concrete curb or curb and gutter, the expansion joints in the sidewalk shall have the same spacing as the curb. The expansion joint shall be filled to full cross-section of the sidewalk with $\frac{3}{8}$ inch pre-molded joint filler. Curb ramps shall be of the type specified in the Plans and shall include the cast-in-place detectable warning surface.
- J. Concrete sidewalks shall be cured for at least 72 hours. Curing shall be by means of moist burlap or quilted blankets or other approved methods. During the curing period, all traffic, both pedestrian and vehicular, shall be excluded. Vehicular traffic shall be excluded for such additional time as the Project Representative may specify.
- K. The detectable warning surface shall be located as shown in the Plans. The detectable warning surface shall have the truncated dome shape. The detectable warning surface area shall be yellow and shall match **SAE AMS Standard 595**, color number 33538. Placement of the cast-in-place detectable warning surfaces shall be in accordance with the manufacturer's recommendation for placement in fresh concrete, before the concrete has reached initial set, or on a hardened cement concrete surface or asphalt pavement surface. Vertical edges of the detectable warning surface shall be flush with the adjoining surface to the extent possible (not more than $\frac{1}{4}$ inch above the surface of the pavement) after installation.

END OF SECTION

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SECTION 32 16 33 DRIVEWAYS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for providing cement concrete driveway entrances in accordance with the Contract Documents.

1.02 REFERENCE STANDARDS

- A. The references listed below are a part of this Section. 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 listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
City of Tacoma	Standard Plans

1.03 DEFINITIONS

(NOT USED)

1.04 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Concrete Mix Design: Submit concrete mix design and test results.

PART 2 PRODUCTS

2.01 GENERAL

- A. Cement concrete driveway approaches shall be constructed with air entrained concrete Class 4000.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. Cement Concrete Driveway Entrance in accordance with **City of Tacoma Standard Plan No. SU-07 Cement Concrete Access Type 1** and as shown on the Contract Drawings.

- B. Driveway entrance concrete may be placed, compacted, and finished using hand methods. The tools required for these operations shall be approved by the Project Representative. After troweling and before edging, the surface of the driveway entrance shall be brushed in a transverse direction with a stiff bristled broom.
- C. Cement concrete driveway entrance shall be cured for at least 72 hours. Curing shall be by means of moist burlap or quilted blankets or other approved methods. During the curing period, all traffic, both pedestrian and vehicular, shall be excluded. Vehicular traffic shall be excluded for such additional time as the Project Representative may specify.

END OF SECTION

SECTION 32 17 23 PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for furnishing and installing pavement marking tape to delineate location of trash compactors.

1.02 DEFINITIONS

(NOT USED)

1.03 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Product Data: Submit manufacturer's product data for pavement marking materials to the Project Representative for approval.

PART 2 PRODUCTS

2.01 GENERAL

- A. Material for pavement marking tape shall be 3M A271ES Stamark™ Pavement Marking Tape, 4" Yellow, or approved equal.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. Installation of pavement marking tape shall be per manufacturer's recommendations.

END OF SECTION

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SECTION 32 31 24 ALUMINUM DOORS AND GATES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes aluminum doors and gates fabricated from extruded aluminum framework, including aluminum door frames of various sizes, posts and 2 single-panel double swing gate utilized in Site A and B. Door and gate panels shall be furnished and installed as shown on the plans and specified herein, overall height and opening width of doors and gates shall be as shown on the plans
- B. **RELATED SECTIONS:**
1. **Section 01 33 00 – Submittal Procedures**
 2. **Section 01 74 20 – Construction Waste Management and Disposal.**
 3. **Section 01 78 00 – Closeout Submittals**
 4. **Section 03 30 31 – Cast-in-Place Concrete:** Concrete footings for posts
 5. **Section 05 07 00 – Decorative Metal Panels**
 6. **Section 08 70 00 – Entry Hardware**
 7. **Section 09 90 00 – Painting and Coating**
 8. **Section 28 13 00 – Access Control & Video Management System:** electrical service and connections for key card reader system for doors

1.02 REFERENCES

REFERENCE	TITLE
ASTM B 209	Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B 221	Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
ASTM D3363	Standard Test Method for Film Hardness by Pencil Test
ASTM D2794	Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation
ASTM B117	Standard Practice for Operating Salt Spray Apparatus
ASTM D822	Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings
AWS D1.2	Structural Welding Code – Aluminum

1.03 REQUIREMENTS

- A. Furnish materials, labor, expertise, and equipment necessary to complete all work specified in this section and as shown on the drawings.
- B. Structural Performance: Provide product and installation capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
 - 1. Uniform pressure of 30 lbf/sq. ft. acting inward or outward.
 - 2. Thermal Movements resulting from a temperature change (range) of 120 degrees Fahrenheit ambient and 180 degrees Fahrenheit material surfaces.

1.04 SUBMITTALS

- A. Shop Drawings:
 - 1. Submit final assembly drawings in accordance with **Section 01 33 00 - Submittal Procedures**.
 - a. Submittals shall be in accordance with standard construction practices to include complete detailed layout of all gate panels and gate posts.
Submittals shall include plan layout, elevations, and section views of doors and gates.
 - 2. Product data for components and accessories.
 - 3. Shop Drawings showing layout, dimensions, profiles, spacing of components, door interface with decorative metal panel, tied in key card reader system, and anchorage and installation details.
 - 4. Copy of warranty specified in for review by Project Representative.
 - 5. Indicate electric power requirements, installation details, wiring diagrams.
- B. Installation instructions:
 - 1. Submit two copies of manufacturer's written UL325 compliant installation instructions.
 - 2. Submit reference list of five (5) installations of the specified type within the last 2 years.
 - 3. Test reports: .1 Drive unit shall bear a label indicating that the gate controller/operator mechanism has been tested certified to current UL 325 standards.

1.05 CLOSEOUT SUBMITTALS

- A. Provide operation and maintenance documentation for door and access key card system for incorporation into manual specified in **Section 01 78 00 - Closeout Submittals**.
- B. Conduct comprehensive demonstration for maintenance staff on operation and care of door and gate system.

1.06 QUALITY ASSURANCE

- A. Standards: Comply with standards specified herein as listed in the General and Supplementary Conditions and Division 1 of the specifications
- B. Qualifications of the Manufacturer: A company specializing in the manufacture of automated gate systems.
- C. Qualifications of the Installer: A minimum of three years' experience installing similar equipment and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's instructions. Protect against damage.

1.08 WARRANTY

- A. Provide in accordance with **Section 01 78 00 - Closeout Procedures**
- B. 20-year warranty for factory finish against cracking, peeling, and blistering under normal use.

1.09 MATERIALS

- A. Approved manufacturer:
 - 1. PalmSHIELD Manufacturing. Atlas gate design, or approved equal.
 - 2. Heavy duty single swing access door and double swing access gate design
- B. Door and Gate Material Descriptions:
 - 1. Extruded Aluminum: **ASTM B 221**, Alloy 6063 – Temper T-6.
 - 2. Sheet Aluminum: **ASTM B211**, Alloy 6063 – Temper T6.
 - 3. Door and Gate Posts: ¼" thick **Grade A-500** tubular steel
 - 4. Post Plate: **Grade A36**
 - 5. Door and Gate Panel Infill Description:
 - a. Refer to **Section 05 07 00 - Decorative Metal Panel** for infill material
 - 6. Hardware
 - a. All fittings and accessories shall be stainless steel and sized as specified by the fence manufacturer.
 - b. Gate hinges to be Gorilla barrel hinge with ¾" rod, ball bearing, and grease zert. Hinge plate to be ½" thick plates offset to create a 5/8" gap. Standard hardware as required by the gate manufacturer for complete functional operation. Hinges to be bolted to gate frame and field welded to steel gate posts.
 - c. Gate lock to be Locinox FortyLock mortise lock. Lock to be industrial and polished 100% stainless steel locksets include a keyable cylinder and auto-latching mechanism. Lock to be internal lock with exterior grab handles. Lock may be keyed and rekeyed. Lock is accessible from both sides of gate.

- d. Drop rods to be 1" schedule 40 pipe and through bolted to gate frame.
- e. Hardware: Size and type as determined by the manufacturer. Provide number of hinges recommended by manufacturer per leaf.

C. Door

- 1. Posts: 4" x 4" extruded aluminum tubular shapes and capped
- 2. Post length will be determined by door height and foundation design as indicated on Drawings.
- 3. Frame: Welded frame, 2" x 4" extruded tubular 6063 aluminum to be welded to panel framework.
- 4. Panel leaf: 3 by 3 inches angle 6063 aluminum
- 5. Post and frame tube length will be determined by door height, door width and foundation design as indicated on Drawings.

D. Gate

- 1. Posts: 6" x 6" extruded aluminum tubular shapes and capped
- 2. Post length will be determined by door height and foundation design as indicated on Drawings.
- 3. Frame: Welded frame, 2" x 4" extruded tubular 6063 aluminum to be welded to panel framework.
- 4. Panel leaf: 3 by 3 inches angle 6063 aluminum
- 5. Post and frame tube length will be determined by door height, door width and foundation design as indicated on Drawings.

1.10 ACCESSORIES

- A. Fasteners: Tamper resistant stainless steel bolts of type, size, and spacing as recommended by fence manufacturer for specific condition.
- B. End caps: Provide aluminum caps for exposed open extruded aluminum sections and for attachment of components to posts.
- C. For exposed locations, provide anti-intruder bolts consisting of cup-head bolt and nut with clamping hexagon such that tightening shears hexagon and render bolt impossible to release.

PART 2 EXECUTION

2.01 PREPARATION

- A. Prior to fabrication, field verify required dimensions.
- B. Coordinate door installation with provision of door operator specified in to ensure proper power supply and that conduit and wiring are concealed.
- C. Cast concrete footings in accordance with **Section 03 30 31 - Cast-in-Place Concrete** as detailed on Drawings and approved Shop Drawings.

1. Core drill concrete footings for embedment of fence posts. Hole shall be 2 inches minimum greater than post width.

2.02 INSTALLATION

- A. Provision of concrete foundations as determined by local engineer.
- B. Install door and gate in accordance with manufacturer's installation instructions and approved shop drawings.
- C. Install posts plumb and level by setting pos in hole drilled in concrete and grouting solid.
- D. Do not install bent, bowed, or otherwise damaged components. Remove damaged components from site and replace.
- E. Secure gate and door panels with stainless steel anti-intruder bolts to posts after posts have been set in footings.
- F. Gates and Doors:
 1. Install gates and doors and adjust hardware for smooth operation.
 2. Provide concrete center foundation depth and drop rod retainers at center of double swinging gate openings.
 3. After installation, test gate/door and operator. Open and close a minimum of five times. Correct deficiencies and adjust.
- G. Touch-up damaged finish with paint supplied by manufacturer and matching original coating.

PART 3 EXECUTION

(NOT USED)

END OF SECTION

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SECTION 32 81 00 IRRIGATION

PART 1 GENERAL

1.01 SUMMARY

- A. The work of this section includes, but is not limited to, the following:
 - 1. Review existing irrigation for both Site A and Site B with property owner and City prior to start of work.
 - 2. **Refer to SECTION 01 11 00 - Summary of Work**

1.02 RELATED SECTIONS

- A. Related Sections:
 - 1. **Section 01 33 00 - Submittal Procedures**
 - 2. **Section 32 90 00 - Planting**

1.03 INSPECTION OF CONDITIONS

- A. Examine related work and project site before starting work of this Section. Report to the Project Representative, in writing, conditions which will prevent the proper execution of this work. Beginning the work of this section without reporting unsuitable conditions to the Project Representative constitutes acceptance of conditions. Contractor shall do any required removal, repair, or replacement of work caused by unreported unsuitable conditions at no additional cost to Owner.

1.04 CODES, RULES AND SAFETY ORDERS

- A. All work and materials to be in full accordance with latest rules, regulations, and safety orders of Division of Industrial Safety; the Uniform Plumbing Code published by the Western Plumbing Officials' Association; The State and Local Electrical Code; and other applicable laws or regulations. Nothing in these drawings or specifications is to be construed to permit work not conforming to these codes. Should the Construction Documents or instructions be at variance with these rules and regulations, notify Project Representative for instructions before proceeding with the work affected.
- B. When the specifications and/or drawings call for or describe materials, workmanship or construction of a better quality, higher standard or larger size, these specifications and/or drawings shall take precedence over the above rules, regulations, or codes.
- C. Furnish and maintain all warning signs, shoring, barricades, red lanterns, etc., as required by the Safety Orders of the Division of Industrial Safety, and local ordinances. Take care to protect open trenches and pits.

1.05 PERMITS AND FEES

- A. Obtain all permits and pay required fees to any governmental agency having jurisdiction over the work. Arrange inspections if required by local agencies and ordinances during the course of construction.

1.06 SUBMITTALS

- A. No more than 60 days after award of contract, and at least 30 days prior to the start of work, submit the following data for products not specified by manufacturer (i.e., piping, wire) and products submitted for approval as equal:
 - 1. Manufacturer's descriptive data including operating characteristics, operating pressures, pressure losses, materials used in products, test certificates, special features, guarantees, and other data required to completely describe the product. All information submitted for approval as equal shall be submitted on standard CSI substitution request form available from the office of the Project Representative.
 - 2. Samples of the approved substitutions (prior to bid opening) when requested by Project Representative.
- B. Contractor shall furnish as-built drawings of the revised irrigation system in accordance **Division 1**.
 - 1. The Project Representative shall provide two sets of prints showing the area of restoration required under this contract. The prints are to be on site at all times during the construction so that Contractor can make a daily record of all work installed.
 - 2. Actual location of hidden items including valves, stub outs, manual drains, shut-off valves shall be shown on the prints by dimensions from easily identified permanent features, such as buildings, curbs, fences, walks or property lines. Drawings shall show approved manufacturer's name and catalogue number. The drawings shall be to scale and all indications shall be neat. These prints will be observed by the Project Representative throughout the course of work.
 - 3. After testing and approval of mainlines and laterals for cover-up, all information noted on the prints shall be transferred to a clean print with all indications recorded in a neat, orderly way by Contractor. The record print shall be turned over to the Project Representative for review at or before the Provisional Review (punch list) of the Project.
 - 4. At time of final review of the completed installation, the Contractor shall have completed revisions to the Project Representative's satisfaction, of the as-built drawings (indicating all changes) ready to turn over to the Owner for recording purposes; this shall be accomplished prior to final payment.
- C. The Contractor shall provide irrigation operations and maintenance manual and the following information for all items used on the system per **Division 1**:
 - 1. List of authorized distributors and service representatives for each item of irrigation equipment, including names, addresses and phone numbers.

2. Guarantee/warranty certificates for all equipment used and Contractor's written one-year warranty.
3. Parts lists for each item with exploded views showing part numbers.
4. Copy of all required permit and inspection forms (if necessary)

1.07 SUBSTITUTIONS

- A. Substitution, if any, shall be requested as per **Section 01 60 00 – Product Substitutions**. Installation of any approved substitution is Contractor's responsibility. Any changes required for installation of any approved substitution must be made to the satisfaction of Project Representative and without additional cost to Owner. No on-site substitutions will be permitted.

1.08 PROTECTION OF EXISTING CONDITIONS

- A. Contractor shall protect work, adjacent property, public, and be responsible for any damage or injury arising from this contract; take reasonable care to discourage vandalism. Confine work to areas designated. Do not disturb natural vegetation outside of project limit lines. Protect all trees and shrubs within project limits not designated to be removed. Repair or replace vegetation damaged as a result of Contractor's operations to satisfaction of Owner at Contractor's expense.
- B. Contractor shall be cognizant of all utility lines and underground obstructions. Contractor shall also be familiar with all utility, irrigation, mechanical, and electrical plans so that digging / drilling operations do not damage lines. Should utilities or other work not shown on the plans be found during excavations, Contractor shall promptly notify Project Representative. Failure to do so will make Contractor liable for any and all damage thereto arising from his operations subsequent to discovery of such utilities not shown on plans.
- C. Contractor shall replace or repair at their own expense any existing building, equipment, underground utilities, walks, stairs, and/or forms damaged as a result of Contractor's operations in a manner satisfactory to the Owner before final payment is made.

1.09 PRODUCT HANDLING

- A. Protect work and materials under this Section from damage during construction and storage. Protect polyvinyl chloride (PVC) pipe and fittings from direct sunlight. Beds on which pipe is stored must be full length of pipe. Do not use any pipe or fitting that has been damaged, dented, or rusted.

1.10 JOB CONDITIONS

- A. Existing irrigation to be reviewed on site with Project Representative prior to start of work.

1.11 SITE REVIEWS AND TESTS

- A. Submit verbal requests for SITE REVIEWS to Project Representative at least 48 hours prior to anticipated review. Do not request testing until satisfied that work will pass test.

1.12 CLEAN-UP

- A. Keep all areas of work clean, neat, and orderly at all times. Keep paved areas clean during installation by sweeping daily. Clean up and remove all debris from entire work area prior to Final Acceptance to satisfaction of Project Representative.

1.13 PROVISIONAL REVIEW (PUNCH LIST)

- A. Upon completion of all irrigation and other work (if any) required under this contract, the Contractor shall request a provisional review. No partial approvals will be given.

1.14 FINAL REVIEW/ ACCEPTANCE

- A. The Contractor shall request a final review upon satisfactory completion of all punch list items and any other work required under this contract. Final review and acceptance of the work shall establish the beginning of the warranty period.

1.15 WARRANTY

- A. In addition to manufacturer's guarantees or warranties, all work shall be warranted for one year from the date of Final Acceptance against defects in material, equipment, and workmanship by Contractor. Warranty shall also cover repair of damage to any part of the premises (including planting) resulting from leaks, settlement or other defects in materials, equipment, and workmanship to the satisfaction of the Owner.

PART 2 PRODUCTS

2.01 GENERAL

- A. Material and equipment of types and sizes shall match existing or approved equivalent. Material throughout the system shall be new and in perfect condition.

2.02 PIPE

- A. GENERAL: No substitutions of smaller pipe sizes will be permitted, but substitutions of larger sizes of same type at no extra cost with approval are acceptable. Each length of PVC pipe is to be coded with an identifying extrusion "run" number and the manufacturer's name or trade name, the pipe size, and schedule or class.

1. All PVC pipe must bear the following markings:
 - a. Manufacturer's name
 - b. Nominal pipe size
 - c. Schedule or class
 - d. Pressure rating in P.S.I.
 - e. NSF (National Sanitation Foundation) approval
 - f. Date of extrusion
 2. All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule and NSF seal of approval.
- B. Connections between main lines and control valves shall be of Schedule 80 PVC (threaded both ends) nipples and fittings.
- C. All PVC pipe used on the site shall be from the same manufacturer.

2.03 DRAIN ROCK

- A. Unfractured rock, 100% passing 1-1/2" square sieve and 0% passing 3/4" sieve.

PART 3 EXECUTION

3.01 PREPARATION

- A. AVAILABLE PRESSURE VERIFICATION: Prior to the start of any work, verify size, depth and location of water source.

3.02 LAYOUT

- A. Alterations and changes in the layout may be expected in order to conform to the ground conditions and to obtain full and adequate coverage of water. It is understood that corrective measures may become necessary but no changes or alteration in the system as planned shall be made without the prior authorization of the Project Representative.
- B. Where connections to existing stub-outs are required, make necessary adjustments to connect stubs. Adjust layout as necessary to install around existing work. Do not install directly over another line in same trench.

3.03 EXCAVATING AND TRENCHING

- A. Perform all excavations as required for installation of work included under this Section, including shoring of earth banks, if necessary. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavation, to their original condition.
- B. Dig trenches wide enough to allow a minimum of 6" between parallel pipelines. Trenches shall be of sufficient depth to provide minimum cover from finish grade as follows:

1. Trenches shall be excavated for all pipe to provide a minimum depth of cover below finish grade as follows:
 - a. Mainline: 24"
 - b. Lateral (non-pressure) lines in all other areas: 18"
2. Excavate to depth required in any material encountered with no extra compensation. Materials unsuitable for bedding of pipe to be removed to depth 4" below trench bottom and replaced with any of the following suitable bedding materials as directed by the Project Representative:
 - a. From bottom of trench to specified subgrade: Excavated trench material free of material which might damage the pipe, including rocks, roots, trash, sticks, debris, or other sharp objects over 1" in diameter, or sand as required.
 - b. From subgrade to finish grade: Topsoil, depth and type as specified in **Section 32 90 00, Planting.**
3. The top 6" of topsoil, when such exists, shall be kept separate from subsoil and shall be replaced as the top layer when backfill is made.

Exercise care when excavating trenches near existing trees and shrubs. Where roots are 2" and greater in diameter, except in the direct path of the pipe, hand excavate and tunnel. When large roots are exposed, wrap with heavy burlap for protection and to prevent excessive drying. Trenches dug by machines adjacent to trees having roots 2" and less in diameter shall have the sides hand trimmed, making a clean cut of the roots. All roots 1/2" and greater in diameter that are cut and trimmed shall be treated with an approved tree wound dressing. Trenches having exposed tree roots shall be backfilled within 24 hours unless adequately protected by moist burlap or canvas.

3.04 SLEEVING

- A. Install sleeves under all paved and surfaced areas, through walls, and as required to facilitate a smooth construction sequence. Coordinate with other trades as required.
- B. Sleeves to be minimum twice the IPS diameter of insert pipe, and shall extend a minimum of 12" beyond edge of walls, walks, and paving. Plug ends of pipe to prevent soil from entering ends, if backfill is required prior to use.
- C. Sleeve at depths specified for pipe under **3.03 Excavating and Trenching.**

3.05 PIPE ASSEMBLY

- A. GENERAL:
 1. Install pipe in accordance with manufacturer's instructions.
 2. Seal all threaded joints with Teflon tape or Rectorseal "Heavy Duty" #100 Virgin Teflon Thread Sealing Paste.
 3. Take care not to over-tighten metal pipe to PVC fittings.

4. Keep interior of pipes clean and free from dirt, debris, excess solvent, pipe cuttings or burrs, and ream to full diameter. When pipe laying is not in progress, close ends of pipe.
- B. PVC PIPE: Use two-step solvent weld process only; apply as per manufacturer's recommendations. No water shall be permitted in pipe until a period of at least 10 hours has elapsed for solvent weld setting and curing. The joints shall be allowed to cure at least 24 hours before pressure is applied to the system.
- C. Only factory-threaded Schedule 80 PVC pipe may be connected to a threaded fitting without an adapter. No male PVC adapters permitted. Use only female PVC adapters with schedule 80 PVC nipples (3" minimum length).
- D. Snake pipe from side to side of trench bottom to allow for expansion and contraction.

3.06 SPRINKLER HEADS

- A. SPRAY HEADS:
 1. Install on flexible nipple or triple swing joint as detailed.
 2. Adjust head height as detailed, and set 6" back from pavement, curbs, and buildings and perpendicular to finish grade, unless otherwise noted.
- B. All heads shall have screens under the nozzle. All spray heads shall be equipped with an internal pressure regulator to prevent misting and fogging. The heads shall be equipped with a check valve to prevent low head drainage where required. The check valve shall hold backpressure equivalent to 10 foot of head.

3.07 AUTOMATIC CONTROL VALVES/ VALVE BOXES

- A. Reinstall if required near existing locations or relocate as necessary for zoned area. Where valves occur adjacent to paved areas, install so that the valve box will be no closer than 12" to paving and perpendicular or parallel to it.
- B. Enclose all valves in valve boxes, in protective sleeves with locking caps. Valve box extensions may be required.
- C. Valve bonnet packings and bolts shall be checked and tightened. Provide sufficient room to service all equipment.

3.08 FLUSHING

- A. MAINS: Two full-open flushings; one prior to placement of valves, the second after placement of valves and quick coupler and prior to hydrostatic testing.
- B. LATERALS: One fully open flushing prior to placement of sprinkler heads and/or drain valves.

3.09 TESTING

A. GENERAL:

1. To be valid, all tests must be performed under the direction of the Project Representative.
2. If any part of the irrigation system is backfilled before testing or inspection, it must be completely uncovered and exposed until approved for backfilling.
3. Contractor shall furnish a pressure gauge mounted on a quick coupler valve key for testing at location directed by Project Representative.

B. PREPARATION:

1. Prior to request for preliminary testing, accomplish the following:
 - a. Install all piping, valves, and other equipment, except sprinkler heads.
 - b. Cap all risers except first riser downstream from valve on each lateral.
 - c. Purge all air from mainlines.

C. PRELIMINARY TESTING:

1. Test of Mains and Valves: *Not required unless mainline is relocated or replaced.* With all valves in place and closed, test at 150 psi minimum for 30 minutes without introduction of additional service or pumping pressure. Lines that show loss of pressure exceeding 5 psi at the end of specified test period shall be rejected.
2. Test of Laterals: Purge all air from laterals and cap all risers. Open lines will be inspected visually. Lines that evidence visible leakage shall be rejected.
3. Rejected systems or portions of systems shall be repaired and retested until approved. Do not request retest until satisfied that system will pass testing requirements.

3.10 BACKFILL AND COMPACTION

A. BACKFILL:

1. After system is operating and the required tests and approvals have been made, backfill excavations and trenches with the specified backfill. Backfill when PVC pipe is not in an expanded condition due to heat or pressure. Cooling the pipe can be accomplished by operating the system a short time or by backfilling in the early part of the morning.
2. The top 6" of soil shall be replaced original topsoil with all rocks, and sticks removed.

B. COMPACTION:

1. Trenches shall be thoroughly water settled. No sluicing will be permitted. Trenches shall be backfilled uniform flush with the surrounding grade, raked and rolled with a 260-IB roller.
2. Trenches or tunnels under roads or paved areas shall be backfilled and tamped with a mechanical tamper in successive 6" lifts.

3. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to minimum 95% density under pavements, 85% under planted areas. Dress all areas to surrounding finish grades.

3.11 CLEAN-UP

- A. Remove all roots, rocks and debris from site, and sweep and wash spotlessly clean all sidewalk surface, pavement area and enclosure walls.

3.12 PROVISIONAL REVIEW (PUNCH LIST)

- A. Request provisional review at time of completion of all work required under contract (including work from other sections, if any).

Prior to request for provisional review, accomplish the following:

1. Complete all work including balancing, adjusting the to provide optimum coverage without fogging.
2. Complete the operations and maintenance manual ready for review by Project Representative, and record zones on inside controller face.
3. Complete as built for review by Project Representative.
4. Obtain all miscellaneous keys, spare parts and tools required under this contract for review by Project Representative and delivery to Owner.
5. Clean out all sediment from valve boxes so that soil level is to bottom of valve, and all wiring (including spare wire) is visible.
6. Coverage Check: Remove all valve box covers and operate each zone of the system at direction of Project Representative.
7. Correct any items noted on the punch list prior to request for final Review.

END OF SECTION

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SECTION 32 90 00 PLANTING

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Section includes:
 - 1. Removal of (1) one existing tree and shrubs at Site A Site (S 8th St and Court A) and (1) existing tree at Fireman's Park as noted in the Plans.
 - 2. Planting (3) new trees (to be provided to the Contractor by the City of Tacoma) at Fireman's Park as noted on the Plans.
 - 3. Restoring existing landscape planter edges and replace existing plantings (to remain) disturbed by construction activities as noted on the Plans.

1.02 RELATED SECTIONS

- A. **Section 32 81 00 - Irrigation**

1.03 INSPECTION OF CONDITIONS

- A. Examine related work and project site before starting work of this section. Report to the Project Representative, in writing, conditions which will prevent the proper execution of this work. Beginning the work of this section without reporting unsuitable conditions to the Project Representative constitutes acceptance of conditions. Contractor shall do any required removal, repair, or replacement of work caused by unreported unsuitable conditions at no additional cost to Owner.

1.04 DEFINITIONS

- A. Nomenclature for plants and varieties shall be in accordance with the current edition of "Standardized Plant Names "as prepared by the American Joint Committee on Horticulture Nomenclature.

1.05 REFERENCES

- A. This section incorporates by reference the latest revisions of the following documents. In case of conflict between the requirements of this section and the listed documents, the requirements of the Contract Specification Sections shall prevail:
 - 1. The current edition of "Standardized Plant Names "as prepared by the American Joint Committee on Horticulture Nomenclature.
 - 2. American Nursery and Landscape Association/American National Standards Institute (ANLA/ANSI):
 - a. Z60.1, American Standard for Nursery Stock.
 - 3. International Society of Arboriculture Best Management Practice Series.

1.06 SUBMITTALS

- A. Refer to Paragraph 2.01 of this section for Landscape materials submittal requirements.
- B. CRITICAL PATH SCHEDULE:
 - 1. Provide schedule showing when trees (supplied by City are anticipated to be planted.
 - 2. Indicate anticipated dates Project Representative will be required to review installation for initial acceptance and final acceptance.

1.07 QUALITY ASSURANCE

- A. All plants shall comply with Paragraph 2.01 of this section. Collected plant material shall not be accepted.
- B. All work shall be performed by a licensed Landscape Contractor registered in the State of Washington and shall be qualified for landscaping work through certification by the Washington Association of Landscape Professionals (WALP) or by the Washington State Nursery and Landscape Association (WSNLA).
- C. Inspections will be made by the Project Representative. The Contractor shall request inspection at least 24 hours in advance of the time inspection is required. Inspections at the following times will be required:
 - 1. Tree planting method
 - 2. For Final Acceptance of all work.

1.08 PROTECTION OF EXISTING CONDITIONS

- A. Contractor shall protect work, adjacent property, public, and be responsible for any damage or injury arising from this contract; take reasonable care to discourage vandalism. Confine work to areas designated. Do not disturb natural vegetation outside of project limit lines. Protect all trees and shrubs within project limits not designated to be removed. Repair or replace vegetation damaged as a result of Contractor's operations to satisfaction of Owner at Contractor's expense.
- B. Contractor shall be cognizant of all utility lines and underground obstructions. Contractor shall also be familiar with all utility, irrigation, mechanical, and electrical plans so that digging / drilling operations do not damage lines. Should utilities or other work not shown on the plans be found during excavations, Contractor shall promptly notify Project Representative. Failure to do so will make Contractor liable for any and all damage thereto arising from his operations subsequent to discovery of such utilities not shown on plans.
- C. Contractor shall replace or repair at their own expense any existing building, equipment, underground utilities, walks, stairs, and/or forms damaged as a result

of Contractor's operations in a manner satisfactory to the Owner before final payment is made.

1.09 PROJECT CONDITIONS

- A. Before proceeding with any work, the Contractor shall inspect the site, carefully check all grades and verify all dimensions and conditions affecting the work.
- B. Contractor shall report to the Project Representative all deviation and/or conflicts between Contract Drawings, Contract Specifications and Site Conditions. Extra work arising from failure to do so shall be done at the Contractor's expense.

PART 2 PRODUCTS

2.01 LANDSCAPE MATERIALS

- A. PLANT MATERIALS
 - 1. Trees shall be provided to the Contractor by City of Tacoma.
 - 2. Scientific name, size and supplied nursery of replaced existing plantings (to remain) disturbed by construction activities for Project Representative review and approval.
- B. TOPSOIL
 - 1. Topsoil Type A:
 - a. Topsoil Type A shall be used where indicated on the Plans. Topsoil Type A shall be a two-way topsoil blend, consisting of 50% sand and 50% Composted Organic material by volume.
 - b. Composted Organic material shall comply with Paragraph 2.01.C.2 of this section:
 - c. Sand shall be "Washed Building Sand" and meet the following chemical and mechanical analysis:

Size	Sieve	Percent by Weight Passing
No. 4	ASTM E11	100%
No. 270	ASTM E11	0-2%

	Permissible Range
Salinity (millimhos per centimeter or deci Siemens per meter of Saturation extract @ 25°C)	Nil – 3.0
Boron (saturation extract Concentration)	Nil – 1.0 ppm
Sodium (sodium absorption ratio – SAR)	Nil – 6.0

- d. Topsoil Type A shall meet the following requirements:
 - 1) Shall have a pH range of 5.5 - 7.5. Soils indicated having a pH below 5.5 shall be treated with dolomitic limestone as necessary to attain this pH range. Soils having a pH greater than 7.5 shall be treated with sulfur as necessary to attain this pH range.
 - 2) Submit a certified laboratory analysis from an accredited soils-testing laboratory to the Project Representative for approval before delivery to the Project Site. Laboratory analysis shall indicate the material source, mechanical and fertility analysis, laboratory recommendations for native and ornamental plant growth, and compliance with all Topsoil Type A Specifications. The analysis shall be with a sample size of no less than 2 pounds. Contractor shall incorporate any soil amendments recommended by laboratory at no additional cost to the Owner.
- e. Acceptable Sources:
 - 1) Astec, LLC, Bellevue, WA.
 - 2) Cedar Grove Compost Company, Maple Valley, WA.
 - 3) Northwest Cascade, Puyallup, WA.
 - 4) Pacific Topsoils, Inc., Everett, WA.

C. ARBORIST WOOD CHIP MULCH

1. Arborist Wood Chip Mulch shall be coarse ground wood chips (approximately ½" to 6" along the longest dimension) derived from the mechanical grinding or shredding of the above-ground portions of trees. It may contain wood, wood fiber, bark, branches, and leaves; but may not contain visible amounts of soil. It shall be free of weeds and weed seeds including but not limited to the plants on the Pierce County Noxious Weed list (www.piercecountyweedboard.wsu.edu) and shall be free of invasive plant portions capable of resprouting, including but not limited to horsetail, ivy, clematis, knotweed, etc. It may not contain more than ½% by weight of manufactured inert material (plastic, concrete, ceramics, metal, etc.).

Gradation: No Particles may be longer than eight inches. Arborist Wood Chip Mulch, when tested, shall meet the following loose volume gradation:

2. Sieve Size	3. Percent Passing	
	4. Minimum	5. Maximum
6. 2"	7. 95	8. 100
9. 1"	10. 70	11. 100
12. 5/8"	13. 0	14. 50
15. ¼"	16. 0	17. 40

2. Submittals:
 - a. The source of the product and the species of trees included in it;
 - b. A sieve analysis verifying the product meets the above size gradation requirement; and,

D. COMPOST

1. Compost:

- a. Compost products shall be the result of the biological degradation and transformation of Type I or III feedstocks as specified below, under controlled conditions designed to promote aerobic decomposition, per **WAC 173-350-220**, which is available at:
<http://www.ecy.wa.gov/programs/swfa/compost>. Compost shall be stable with regard to oxygen consumption and carbon dioxide generation. Compost shall be mature with regard to its suitability for serving as a soil amendment as defined below. The compost shall have a moisture content that has no visible free water or dust produced when handling the material. Compost production and quality shall comply with Chapter 173-350 WAC, and meet the following physical criteria:
- b. Compost material shall be tested in accordance with the U.S. Composting Council "Testing Methods for the Examination of Compost and Composting" (TMECC) Test Method 02.02-B, "Sample Sieving for Aggregate Size Classification", to meet the size gradations established in the U.S. Composting Council's "Seal of Testing Assurance" (STA) program, as follows.

	Min.	Max.
Percent passing 2"	100%	
Percent passing 1"	99%	100%
Percent passing 5/8"	90%	100%
Percent passing 1/4"	75%	100%

- c. The pH shall be between 6.0 and 8.5 when tested in accordance with **TMECC 04.11-A**, "1:5 Slurry pH".
- d. Manufactured inert material (plastic, concrete, ceramics, metal, etc.) shall be less than 1.0 percent by weight as determined by **TMECC 03.08-A** "percent dry weight basis".
- e. Minimum organic matter content shall be 40 percent by dry weight basis as determined by **TMECC 05.07A**, "Loss-On-Ignition Organic Matter Method".
- f. Soluble salt contents shall be less than 4.0 mmhos/cm tested in accordance with **TMECC 04.10-A**, "1:5 Slurry Method, Mass Basis".
- g. Maturity shall be greater than 80% in accordance with **TMECC 05.05-A**, "Germination and Vigor".
- h. Stability shall be 7 or below in accordance with **TMECC 05.08-B**, "Carbon Dioxide Evolution Rate".
- i. The compost product must originate a minimum of 65 percent by volume from recycled plant waste as defined in **WAC 173-350-100** as "Type I Feedstocks." A maximum of 35 percent by volume of other approved organic waste as defined in **WAC 173-350-100** as "Type III", including post-consumer food waste, but not including biosolids, may be substituted for recycled plant waste. The Project Representative may approve

compost products containing up to 35% biosolids or manure feedstocks for specific projects or soil blends, but these feedstocks are not allowed unless specified. The supplier shall provide written verification of feedstock sources.

- j. Compost shall have a carbon to nitrogen ratio of less than 25:1 as determined using **TMECC 04.01** "Total Carbon" and **TMECC 04.02D** "Total Kjeldhal Nitrogen". The Project Representative may specify a C:N ratio up to 35:1 for projects where the plants selected are entirely Puget Sound native species.
- k. Compost shall score a number 6 or above on the Solvita Compost Maturity Test.
- l. The compost supplier shall test all compost products within 90 Calendar Days prior to application. Samples shall be collected using the Seal of Testing Assurance (STA) sample collection protocol. The sample collection protocol can be obtained from the U.S. Composting Council, 4250 Veterans Memorial Highway, Suite 275, Holbrook, NY 11741 Phone: 631-737-4931, www.compostingcouncil.org. The sample shall be sent to an independent STA Program approved laboratory. The compost supplier shall pay for the test. A copy of the approved independent STA Program laboratory test report shall be submitted to the Project Representative prior to initial application of the compost. The Project Representative may request a sample prior to placement.
- m. Compost not conforming to the above requirements or taken from a source other than those tested and accepted shall be immediately removed from the project and replaced at no cost to the Owner. The Contractor shall submit the following information to the Project Representative for approval:
 - 1) A copy of the Solid Waste Handling Permit issued to the supplier by the Jurisdictional Health Department as per **WAC 173-350** (Minimum Functional Standards for Solid Waste Handling).
 - 2) The supplier shall verify in writing, and provide lab analyses that the Materials comply with the processes, testing, and standards specified in WAC 173-350 and these Specifications. An independent STA Program certified laboratory shall perform the analysis.
 - 3) A list of the feedstock by percentage present in the final compost product.
 - 4) A copy of the producer's current STA certification as issued by the U.S. Composting Council.
- n. Acceptance shall be based upon a satisfactory Test Report from an independent STA program certified laboratory:
- o. Acceptable compost product sources include:
 - 1) Cedar Grove Composting, Maple Valley and Everett, Washington
 - 2) Other approved equal.

E. TREE STAKES

- 1. Stakes shall be 8-foot long 2-inch diameter pressure-treated lodgepole pine wood stakes, with chamfered tops and 6-inch long conical points. The stakes

shall be installed as shown in the Plans unless the Contract indicates otherwise.

2. Submittal: product cut sheet.

F. TREE WATERING BAG SYSTEM

1. Tree watering bag system shall be commercially available, 15-gallon, slow-release watering bag with two (2) water-release points per bag. Materials: UV-stabilized polyethylene with nylon zipper and polypropylene handle straps; color: green.
2. Submittal: product cut sheet.

PART 3 EXECUTION

3.01 EXAMINATION

- A. This section describes work consisting of planting, and maintaining such trees, shrubs and ground cover.
- B. Trees, shrubs and ground covers will hereinafter be collectively referred to as, "plants" or "plant material".
- C. Restore landscaped areas impacted by construction to existing or improved conditions per the Plans.

3.02 CONSTRUCTION REQUIREMENTS

A. LAYOUT OF PLANTING

1. Plants shall be placed at spacing and locations as indicated in the Plans. Location layout and staking shall be the responsibility of the Contractor, subject to the approval of the Project Representative, before planting or construction of each item begins. The Contractor shall notify the Project Representative at least five (5) Calendar Days in advance of projected completion of staking and allow two (2) Calendar Days after the projected completion date for review and any adjustments of the layout by the Project Representative. The Contractor shall sequence the plantings to minimize disturbance to new plantings and existing landscaping. All plants shall be furnished disease and pest free, in good health and condition, true to form, and shall be vigorous growers. All plant material shall be inspected and determined by the Project Representative to be acceptable for planting prior to planting.

B. PLANTING

1. General:
 - a. Trees shall be provided to the Contractor by the City of Tacoma
 - b. Plants shall not be planted during freezing weather or when the ground is frozen. Plants shall not be planted during excessively wet conditions. Plants shall not be placed on any day in which temperatures are forecast to exceed 80 degrees unless the Project Representative approves

otherwise. Plants shall not be placed in areas that are below finished grade.

- c. Dates to plant: Planting shall be performed during the period between October 1st and April 30th unless otherwise approved by the Project Representative.
 - d. If groundwater is encountered upon excavation of planting holes, the Contractor shall promptly notify the Project Representative.
 - e. Plants shall be removed from containers in a manner that prevents damage to the root system. Containers may require vertical cuts down the full depth of the container to accommodate removal. All circling roots shall be loosened to ensure natural directional growth after planting.
2. Trees:
- a. Trees shall be planted per City of Tacoma standard plans LS-01 and LS-02.

C. STAKING

1. Staking:
- a. All deciduous and coniferous trees shall be staked at the time of planting per City of Tacoma standard plan LS-01 unless otherwise indicated on plans.
 - b. Damaged stakes shall be promptly removed and replaced.
 - c. Trees and shrubs found out of plumb by wind or other cause shall be re-plumbed by loosening the soil around the root system and re-plumbing the tree or shrub, and backfilling and compacting as necessary. Adjustment shall not be made by pushing, pulling or restraining the trunk or stem. If, in the opinion of the Project Representative, damage to the root system has occurred as a result of re-plumbing a tree or shrub, the tree or shrub shall be replaced by the Contractor.
 - d. Alternate methods of staking may be proposed by the Contractor and require approval of the Project Representative.
 - e. Tree stakes shall be removed at the end of one year.

D. BARK MULCH

1. Arborist Wood Chip Mulch used as topdressing for tree pits and restoring existing landscape planter edges where shown on the Drawings.

E. CLEAN UP

1. Upon completion of planting, all excess material shall be disposed of. Planting areas immediately adjacent to walks, curbs, pavements, driveways, and other improvement shall be graded and compacted to accommodate the depth of mulch cover, with the mulch surface one (1) inch below with the surface of adjacent improvement.

END OF SECTION

SECTION 33 14 00 WATER UTILITY TRANSMISSION AND DISTRIBUTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for furnishing and installing water service connection, from an existing water meter box near the right-of-way line, and pipe installation up to the new enclosure area at Site A, for two (2) frost free hose bib connections.

1.02 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Product Data: Submit manufacturer's product data for frost free hose bib, adapters, fittings, pipe, and backflow prevention device for Project Representative's approval.

PART 2 PRODUCTS

2.01 GENERAL

- A. Material for frost free hose bib shall be Merrill E-5000 Frost Proof Yard Hydrant or Simmons 800LF Series Deluxe Frost-Proof Yard Hydrant.
- B. Material for service pipe shall be any of the following:
 - 1. **Copper Tubing:** Copper pipe or tubing shall be annealed, seamless, and conform to the requirements of **ASTM B88**, Type K rating
 - 2. **Polyethylene Tubing:** Polyethylene tubing shall meet the requirements of **AWWA C901**. Tubing shall be high molecular mass with a 200 psi rating. Tubing used for ¾ and 1 inch shall be either SDR 7 (iron pipe size) or SDR 9 (copper tube size).
 - 3. **PEX-a Tubing:** PEX-a tubing shall be a minimum of 3/4 inch or a maximum 2-inch in diameter and shall be manufactured in accordance with **AWWA C904** and **ASTM F876**. The tubing shall have a minimum materials designation code of 3306 in accordance with **ASTM F876**, a pressure rating of 200 psi at 73.4 degrees using a design factor of 0.63 as outlined in PPI TR-3, Part F-7, and shall have a minimum SDR of 9. Tubing color shall be blue in accordance with APWA Uniform color standards.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. Install 3/4-inch frost free hose bis per detail shown in the Contract Drawings, approximately 24" above finished grade on 1-inch threaded galvanized pipe.
- B. The Contractor shall provide a backflow prevention device for each hose bib.
- C. Installation of appurtenance shall be per manufacturer's recommendations and approved by the Project Representative.

END OF SECTION

SECTION 33 31 00 SANITARY SEWERAGE PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for furnishing and installing lateral sewer connection to the existing sanitary sewer main for Site A.

1.02 REFERENCE STANDARDS

- A. The references listed below are a part of this Section. 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 listed documents, the requirements of this Section shall prevail.

REFERENCE	TITLE
City of Tacoma	Standard Plans

1.03 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Product Data: Submit manufacturer's product data for sanitary sewer pipe, pipe fittings, and atrium dome drain for Project Representative's approval.

PART 2 PRODUCTS

2.01 GENERAL

- A. The Contractor shall use solid wall PVC pipe and fittings for all side sewers located 10 feet or more from a water service.
- B. The Contractor shall use HDPE atrium dome drain, size as shown on the Plans.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. Construction requirements for installation of sanitary sewer pipe shall be in accordance with **City of Tacoma Standard Plan SU-16 Pipe Zone Bedding and Backfill for Sanitary and Storm Sewers, and City of Tacoma Standard Plan SU-23 Lateral Sewer Connection to Sanitary Sewer Main.**

- B. **Protection of Existing Sewerage Facilities:** All existing live sewers including septic tanks and drain fields shall be kept in service at all times. Provision shall be made for disposal of sewage flow if any existing sewers are damaged. Damage to existing sewers shall be repaired by the Contractor, at no expense to the Contracting Agency, to a condition equal to or better than their condition prior to the damage.
- C. The physical connection to an existing manhole or sewer shall not be made until authorized by the Project Representative. Such authorization will not be given until all upstream lines have been completely cleaned, all debris removed, and where applicable, a pipe temporarily placed in the existing channel and sealed.
- D. Side sewers shall not be backfilled prior to inspection.
- E. Side sewers shall be constructed with a maximum joint deflection not to exceed the manufacturer's printed recommendations and in no case shall exceed 2 inches per foot in any joint. Larger changes in direction shall be made by use of standard $\frac{1}{8}$ bends.
- F. Side sewers shall be connected to the tee, wye, or riser provided in the public sewer, where such is available, utilizing approved fittings or adapters. Where no tee, wye, or riser is provided or available, connection shall be made by machine made tap and approved saddle.
- G. **Testing:** All side sewers shall be cleaned and tested after backfilling by either the exfiltration or low pressure air method at the option of the Contractor, except where the ground water table is such that the Project Representative may require the infiltration test.

All Work involved in cleaning and testing sewer lines shall be completed within 7 calendar days after backfilling of sewer lines and Structures. Any further delay will require the written consent of the Project Representative. The Contractor shall furnish all labor, materials, tools, and equipment necessary to make the test, clean the lines, and perform all incidental Work. The Contractor shall perform the tests under the direction and in the presence of the Project Representative. Precautions shall be taken to prevent joints from drawing during tests, and any damage resulting from these tests shall be repaired by the Contractor at no expense to the Contracting Agency. The manner and time of testing shall be subject to approval by the Project Representative.

All yes, tees, and stubs shall be plugged with flexible jointed caps, or acceptable alternate, securely fastened to withstand the internal test pressure. Such plugs or caps shall be readily removable, and their removal shall provide a socket suitable for making a flexible jointed lateral connection or extension.

Testing side sanitary sewers shall be for their entire length from the public sewer in the street to the connection with the building's plumbing. Their testing shall be as required by the local sanitary agency but in no case shall it be less thorough

than that of filling the pipe with water before backfilling and visually inspecting the exterior for leakage. The decision of the Project Representative as to acceptance of the side sanitary sewer shall be final.

If any sewer installation fails to meet the requirements of the test method used, the Contractor shall determine, at no expense to the Contracting Agency, the source or sources of leakage and shall repair or replace all defective materials or Work at no expense to the Contracting Agency. The complete pipe installation shall meet the requirements of the test method used before being considered acceptable.

- H. **Television Inspection:** The Contractor shall complete inspection of newly installed sanitary sewer lines by the use of a television camera before final acceptance. The Contractor shall bear all costs of the initial inspection and all costs incurred in correcting any deficiencies found during television inspection including the cost of any additional television inspection that may be required by the Project Representative to verify the correction of said deficiency.

END OF SECTION

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SECTION 33 42 00 STORMWATER CONVEYANCE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes specifications for furnishing and installing catch basins at Site A.

1.02 DEFINITIONS

(NOT USED)

1.03 SUBMITTALS

- A. Procedures: **Section 01 33 00 – Submittal Procedures.**
- B. Product Data: Submit manufacturer's product data for precast concrete catch basins for Project Representative's approval.

PART 2 PRODUCTS

2.01 GENERAL

- A. **Precast Concrete Catch Basins:** All precast concrete items shall meet the requirements of **AASHTO M199**, fabricated as shown on the Plans, and shall meet the tolerances and revisions as listed below.
 - 1. The following information shall be legibly marked on each precast product (excluding rectangular and round adjustment sections). Marking shall be indented into the concrete, painted thereon with waterproof paint, or contained within a bar-coded sticker firmly attached to the product:
 - a. fabricator name or trademark.
 - b. date of manufacture.
 - 2. Catch Basin Type 1:
 - a. knock-out wall thickness, measured at thinnest point, 1½ to 2½ inches.
 - b. knock-out diameter, 5 percent plus/minus allowance.
 - c. base thickness, measured at thinnest point, 4 inches with ½-inch minus tolerance.
 - d. all other dimensions as shown on Plans, 5 percent plus/minus allowance.
- B. **Grate Inlets:** Steel in grates, angles, and anchors for grate inlets shall conform to **ASTM A36**, except structural tube shall conform to **ASTM A500**, Grade B, and structural shapes may conform to **ASTM A992**. After fabrication, the steel shall be galvanized in accordance with **AASHTO M111**, or galvanized with a hot-sprayed (plasma flame applied) 6 mil minimum thickness plasma coating.

Steel grating shall be fabricated by weld connections. Welds, welding procedures, and welding materials shall conform with the **AWS D1.1/D1.1M**, latest edition, Structural Welding Code.

PART 3 EXECUTION

3.01 CONSTRUCTION

- A. Construction requirements for installation of catch basin with rectangular vaned grates shall be in accordance with WSDOT Standard Plan B-5.20-03 Catch Basin Type 1 and Standard Plan B-30.30-03 Rectangular Vaned Grate.
- B. The excavation for all manholes, inlets, and catch basins shall be sufficient to leave 1 foot in the clear between their outer surfaces and the earth bank.
- C. The cover or grating of a manhole, catch basin, or inlet shall not be grouted to final grade until the final elevation of the pavement, gutter, ditch, or sidewalk in which it is to be placed has been established, and until permission thereafter is given by the Project Representative to grout the cover or grating in place. Covers shall be seated properly to prevent rocking. Leveling and adjustment devices that do not modify the structural integrity of the metal frame, grate or cover, and do not void the originating foundry's compliance to these specifications and warranty are allowed. Leveling and adjusting devices that interfere with the backfilling, backfill density, grouting and asphalt density will not be allowed. The hardware for leveling and adjusting devices shall be completely removed when specified by the Project Representative.
- D. In the event any pipe enters the manhole through the precast concrete units, the Contractor shall make the necessary cut through the manhole wall and steel mesh. The steel shall be cut flush with the face of the concrete and shall be cut in such a manner that it will not loosen the reinforcement in the manhole wall.
- E. The ends of all pipes shall be trimmed flush with the inside walls.
- F. Rubber gaskets or flexible plastic gaskets may be used in tongue and groove joints of precast units. Joints between precast manhole units used for sanitary sewers shall be rubber gasketed. All other joints and all openings cut through the walls shall be grouted and watertight.
- G. If gaskets are used, handling of the precast units after the gasket has been affixed shall be done carefully to avoid disturbing or damaging the gasket or contaminating it with foreign material. Care shall be exercised to attain proper alignment before the joints are entirely forced home. During insertion of the tongue or spigot, the units shall be partially supported to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned.
- H. Catch basins, manholes, and inlets shall be watertight.

- I. The backfill material for openings dug for Structures shall be nonclay material containing no pieced more than 3 inches across, no frozen lumps, and no wood or other foreign material.
- J. Manholes, catch basins, inlets, and drywells shall be constructed on a compacted or undisturbed level foundation. If the Contractor elects to use a separate cast-in-place base, the concrete shall be Class 4000. Upon final acceptance of the Work, all manholes, catch basins, inlets, drywells, and other drainage Structures shall conform to the requirements of the Standard Plans except as approved by the Project Representative.

END OF SECTION

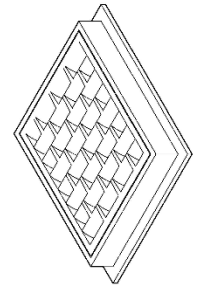
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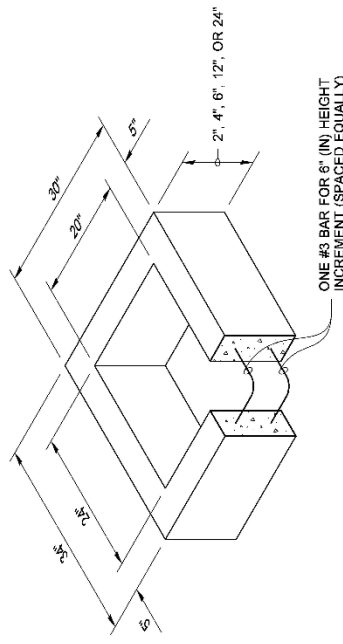
APPENDIX A
PLAN SET
(separate document)

APPENDIX B

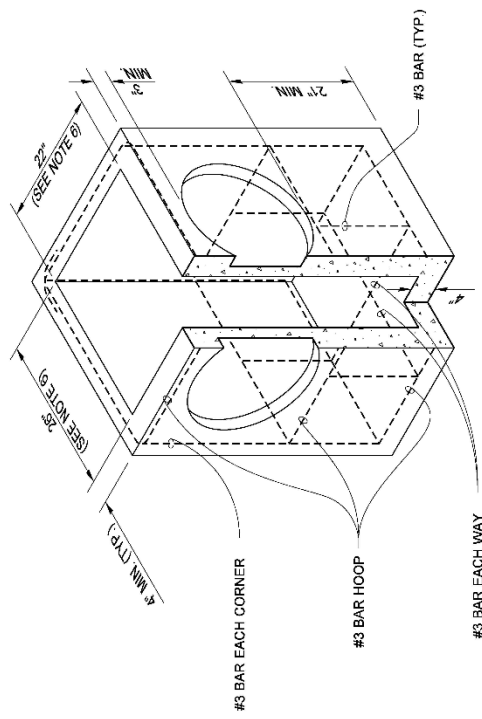
WSDOT AND COT STANDARD PLANS



FRAME AND VANED GRATE



RECTANGULAR ADJUSTMENT SECTION



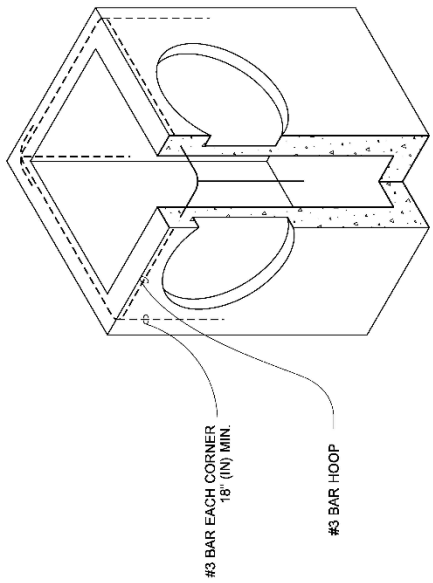
PRECAST BASE SECTION

PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER (INCHES)
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSPSP ★ (STD. SPEC. SECT. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. SECT. 9-05.12(1))	15"
PROFILE WALL PVC (STD. SPEC. SECT. 9-05.12(2))	15"

★ CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
2. The knockout diameter shall not be greater than 20" (in). Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.
3. The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).
4. The frame and grate may be installed with the flange down, or integrally cast into the adjustment section with flange up.
5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.
6. The opening shall be measured at the top of the **Precast Base Section**.
7. All pickup holes shall be grouted full after the basin has been placed.



(SEE NOTE 1)

ALTERNATIVE PRECAST BASE SECTION



Julie Heilman
2020.09.01 07:52:50 -07'00'

CATCH BASIN TYPE 1

STANDARD PLAN B-5.20-03

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Roark, Steve
Digitally signed by Roark, Steve
Date: 2020.09.09 09:45:23 -07'00'
STATE DESIGN ENGINEER

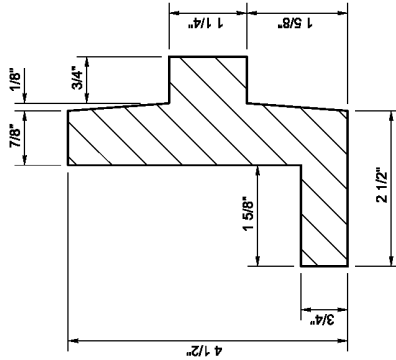
Washington State Department of Transportation

29 1/4"

BOLT-DOWN HOLE (TYP.) ~
5/8" (IN) - 11 NC (SEE
DETAIL & NOTE 2)

25 1/4"

Technical drawing of a rectangular panel. The overall height is 29 1/4" and the overall width is 25 1/4". The panel features a double-line border. Two circular bolt-down holes are shown: one in the top-left corner and one in the bottom-right corner. A leader line points from the text "BOLT-DOWN HOLE (TYP.) ~ 5/8" (IN) - 11 NC (SEE DETAIL & NOTE 2)" to the top-left hole. A small black triangle is located at the bottom center of the panel.

 $7\frac{7}{8}" - 1\frac{1}{8}"$

1. This frame is designed to accommodate 20" (in) x 24" (in) grates or covers as shown on **Standard Plans B-30.20, B-30.30, B-30.40, and B-30.50.**
2. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 304 Stainless Steel (S.S.) 5/8" (in) - 11 NC x 2" (in) allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.
3. Refer to **Standard Specification Section 9-05.15 and 9-05.15(2)** for additional requirements.



BOLT-DOWN DETAILS
SEE NOTE 2



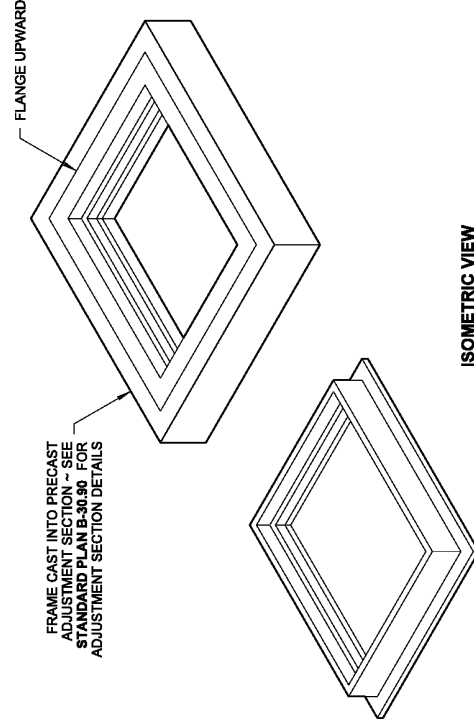
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER



ISOMETRIC VIEW SHOWING THE VARIATIONS



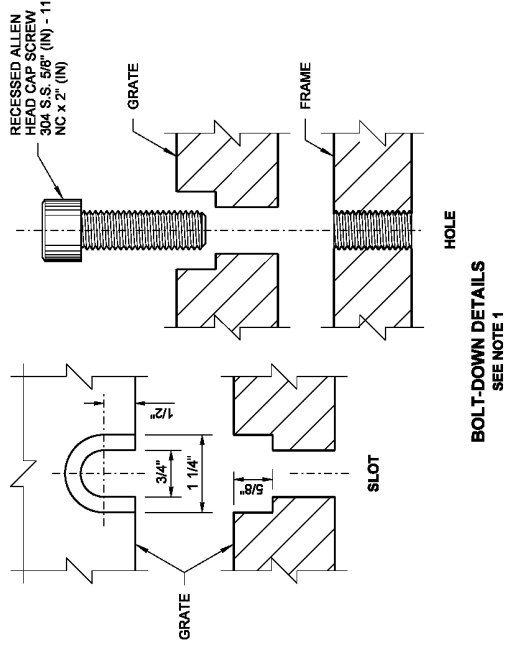
24 1/4"

SECTION

DRAWN BY: FERN LIDDELL

NOTES

-
- Technical drawing of a mold layout showing a top view and a side view.
- Top View:** A rectangular mold layout with a grid of 4 rows and 8 columns of rectangular cells. The cells are separated by vertical and horizontal dividers. The top view is labeled "TOP" and "SECTION B". Dimensions are provided: a total width of 20 inches, a total height of 1 inch, and individual cell dimensions of 3 inches by 5 inches. A note indicates "SLOT ~ SEE DETAIL AND NOTE 1" pointing to a slot in the top view.
- Side View:** A cross-section of the mold, showing the depth of the cells and the thickness of the dividers. The side view is labeled "SECTION A" and "SECTION B".



HOLE
BOLT-DOWN DETAILS
SEE NOTE 1



A diamond-shaped floor tile with a complex geometric pattern. The pattern consists of interlocking rectangles and triangles, creating a woven or lattice-like appearance. The tile is oriented with its vertices pointing towards the corners of the page.

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

ISOMETRIC



Washington State Department of Transportation

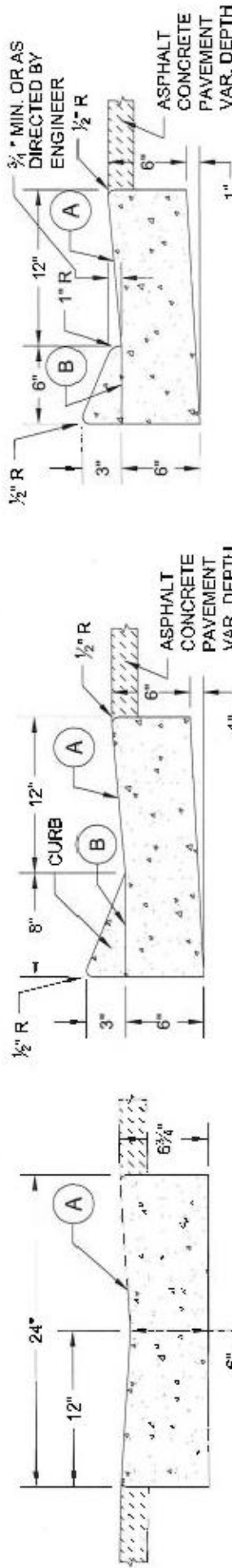
STATE DESIGN ENGINEER



When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement. The height of the curb shall be 6", unless otherwise shown on plans.

-

INTEGRAL CEMENT CONCRETE TRAFFIC CURB



**TYPE "C" MOUNTABLE
CEMENT CONCRETE CURB & GUTTER**

**TYPE "D" MOUNTABLE
CEMENT CONCRETE CURB & GUTTER**

1. For trench crossings, curb and gutter shall be removed to a minimum 2' cut back over undisturbed soil.
2. In all projects, any remaining sections of curb and gutter less than 5' in length between the project area and the nearest control joint shall also be removed and replaced.
3. All joints shall be saw cut full depth prior to restoration and $\frac{3}{8}$ " expansion joint installed.
4. Concrete finish shall match existing.
5. 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. Foundations shall be fully compacted prior to form placement.
7. Unsuitable foundation shall be replaced with $\frac{5}{8}$ " crushed surfacing top course.



TACOMA WATER

CITY ENGINEER

DATE _____

CITY OF TACOMA

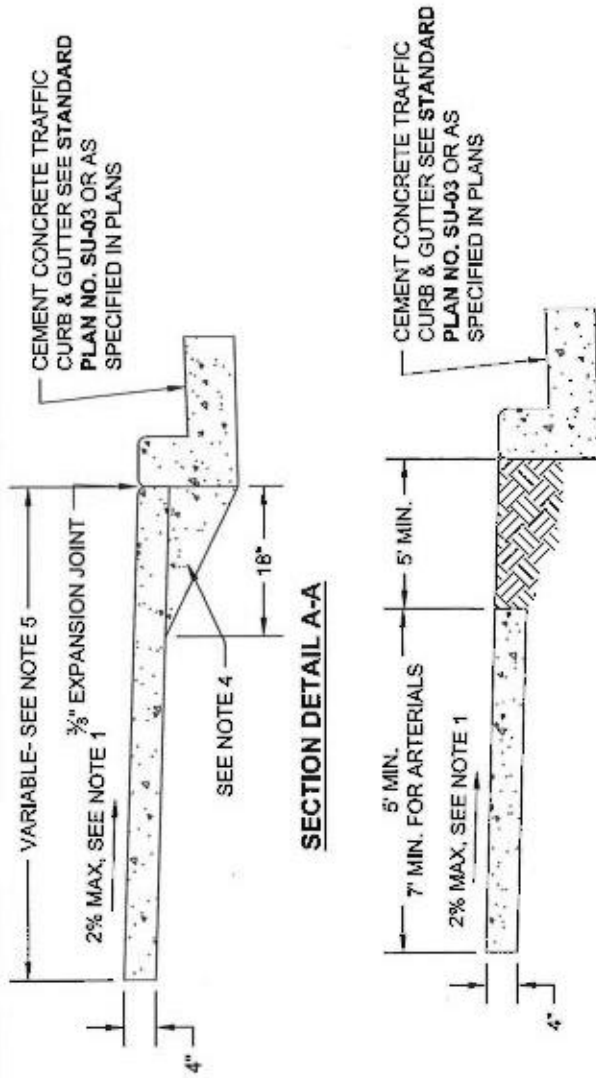
**CEMENT CONCRETE
CURB AND GUTTER**

STANDARD PLAN NO.

4-03

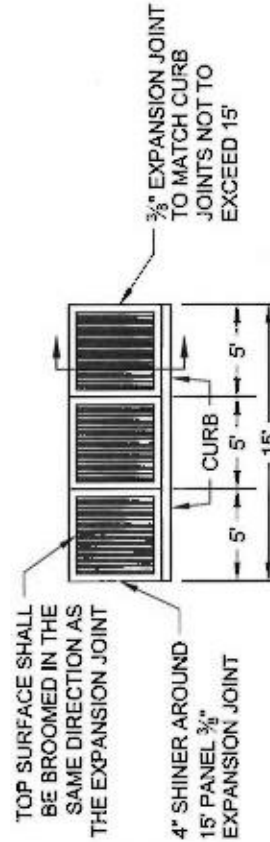
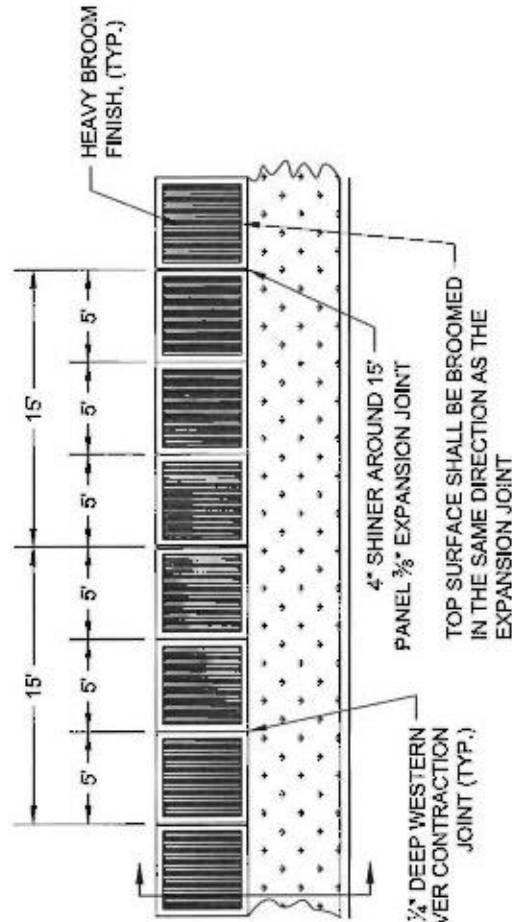
NOTES:

1. Sidewalks shall be designed and constructed in accordance with 2010 ADA Standards, 28 CFR, Part 35 and as supplemented by the Public Right of Way Accessibility Guidelines (PROWAG). City of Tacoma prefers sidewalk cross slopes to be designed to a maximum of 1.5% and a minimum of 1.0%.
2. When placing walk adjacent to existing curb and gutter, curb and gutter will be repaired as necessary before placing concrete forms for walk.
3. Staking is required where no curb is present.
4. Thickened edge shall be constructed using cement concrete on all radii. All other locations shall be backfilled and compacted.
5. Combination walk shall be 7' min. on all commercial sites and arterial streets. Combination walk shall be a minimum of 5' on non arterial streets. Dimensions are from back of curb to back of walk. See contract plans for width and placement of sidewalk.
6. All expansion joints shall be full depth with $\frac{3}{8}$ " premolded joint filler.
7. All joints shall be cleaned and edged. External edges shall be $\frac{1}{2}$ " radius. Internal joints shall be $\frac{1}{4}$ " radius.
8. All soft and yielding foundation material shall be removed and replaced with crushed surfacing top course (CSTC) per Section 9-03.9(3) of the WSDOT Standard Specifications.
9. All sidewalk shall be replaced to the nearest expansion or contraction joint. All joints shall be saw cut full depth prior to restoration and $\frac{3}{8}$ " expansion joint installed. 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.
10. For sidewalks within the North Slope Historic District area use Standard Plan HD-NS03. See Standard Plan HD-NS01 for North Slope Historic District site map.



SECTION DETAIL A-A

SECTION DETAIL B-B



<p>REVIEWED BY <i>DCS</i></p> <p>PUBLIC WORKS <i>N/A</i></p> <p>TACOMA POWER <i>N/A</i></p>	<p>ENVIRONMENTAL SERVICES <i>N/A</i></p> <p>TACOMA WATER <i>N/A</i></p>	<p>APPROVED FOR PUBLICATION</p> <p><i>[Signature]</i></p> <p>CITY ENGINEER</p> <p>DATE <i>4/25/19</i></p>	<p>CITY OF TACOMA</p> <p>CEMENT CONCRETE SIDEWALK</p> <p>STANDARD PLAN NO. SU-04</p>
---	---	---	--

GENERAL NOTES:

1. Provide a separate directional curb ramp for each marked or unmarked crosswalk. Directional curb ramps are preferred over 45 degree ramps. Curb ramp location shall be placed within the width of the associated crosswalk, or as shown on the Contract Plans. The curb ramp centerline shall be parallel to the direction of the crossing. Forty-five (45) degree curb ramps shall be installed only after approval by the City's ADA Coordinator or the Street Operations Division Manager.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush and perpendicular to the direction of travel. There shall be no vertical discontinuity between the base of curb ramp and gutter line.
3. Do not place grates, junction boxes, access covers, or other appurtenances in front of the curb ramp or on any part of the curb ramp or turning space. Placement on or in front of ramp flares is allowed.
4. See Contract Plans for the curb design specified. See **Standard Plan SU-03** and **SU-03A** for Curb, and Curb and Gutter Details.
5. A thickened edge shall be constructed to full depth of adjacent curb along entire curb radius.
6. For sidewalk and curb ramps within the North Slope Historical District area see **North Slope Historic District Site Map, HD-NS01**. Apply Lamp Black 1lb. per cubic yard of cement concrete or as required for discoloration in accordance with ASTM D209-81 Standard Specifications for Lamp Black pigment.
7. The running slope of a curb ramp shall not exceed 8.3% but does not require the ramp length to exceed 15 feet to avoid chasing the slope indefinitely when connecting to steep grades.
8. Curb ramp, turning space and flares shall receive a broom finish, see **WSDOT Standard Specifications 8-14**.
9. Return curbs, (pedestrian curbs), may only be used with landscaping or railing. Return curbs, (pedestrian curbs), shall not be used to prevent pedestrians from crossing streets.
10. All curb ramp designs shall be stamped by a Washington State licensed Professional Engineer. If meeting the current design standards is not possible, curb ramps shall be constructed to the maximum extent feasible as indicated by an Engineer's note on the stamped drawings. Rationale supporting the design variance shall be provided by the Engineer and shall include a description of the scope of work, the site-specific factors affecting compliance, and the measures implemented to improve compliance.
11. Pedestrian traffic should be aligned to the receiving curb ramp. The existing curb ramps shall be evaluated using criteria in the City's Curb Ramp Installation Matrix.
12. Consult the City's Curb Ramp Installation Matrix and the Right Of Way Restoration Policy for additional requirements.
13. Conduit for APS equipment shall be installed during curb ramp construction at all signalized intersections and at intersections where signalization is anticipated within the next 6 years. Coordinate with Public Works - Engineering, Traffic Section.
14. A Pedestrian Accessibility Control Plan shall be developed in conjunction with each project-specific Temporary Traffic Control Plan for all work in the ROW.
15. Pedestrian traffic shall NOT be directed behind the stop bar.
16. Curb ramp alignment should be consistent with crosswalk alignment
17. Curb ramp shall be 5' minimum in width.
18. Catch basins shall be located upstream of curb ramps outside of flare/wing for new construction or when performing storm sewer upgrades.
19. For constructability purposes, the City recommends designing to **less than** the maximum allowable slopes.

DCS

PUBLIC WORKS

REVIEWED BY **GMS**

ENVIRONMENTAL
SERVICES

NA

TACOMA POWER

TACOMA WATER



APPROVED FOR PUBLICATION

[Signature] 8/16/16

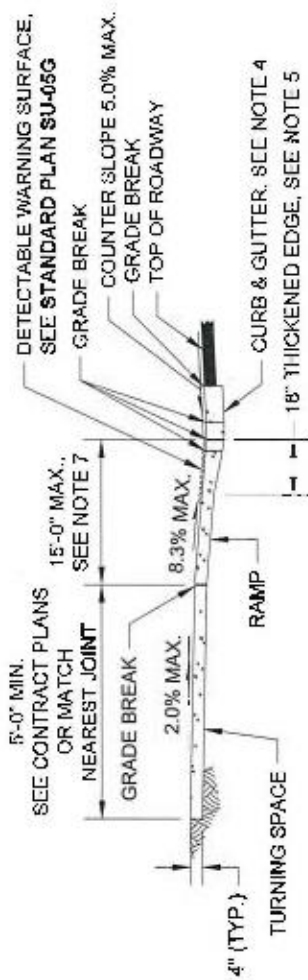
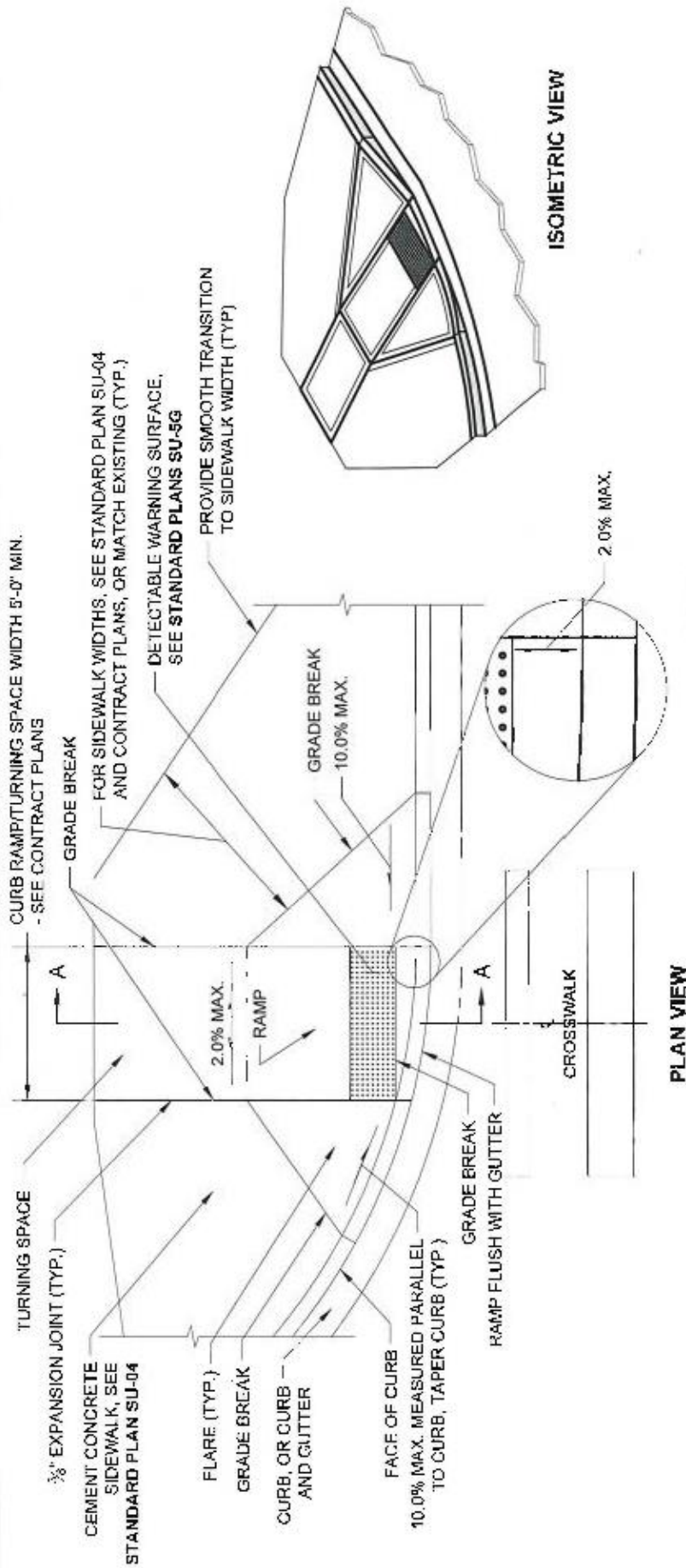
CITY ENGINEER

DATE

CITY OF TACOMA

CURB RAMP DETAILS
GENERAL INFORMATION

STANDARD PLAN NO. SU-05



NOTES:
See Standard Plan SU-05 for referenced notes

LEGEND

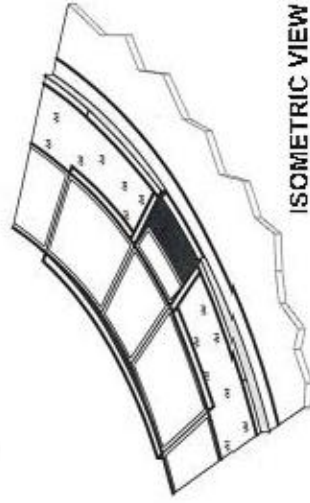
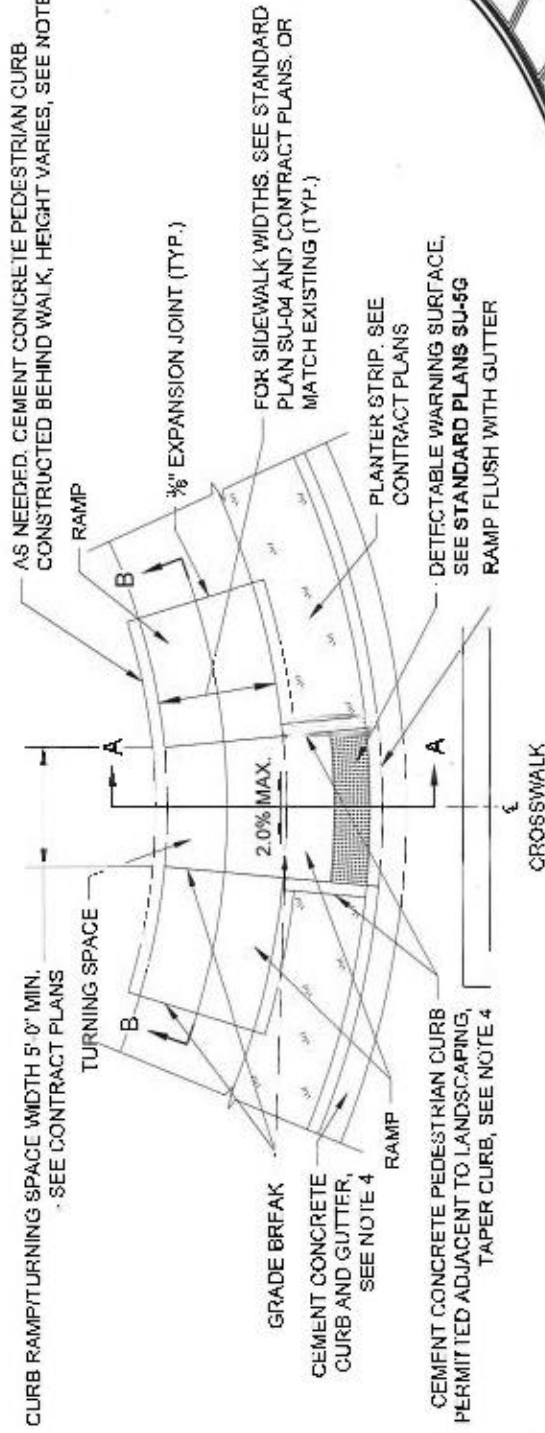
— SLOPE IN EITHER DIRECTION

CITY OF TACOMA	APPROVED FOR PUBLICATION		REVIEWED BY GMS PUBLIC WORKS ENVIRONMENTAL SERVICES N/A
PERPENDICULAR CURB RAMP TYPE 'A'		DATE	TACOMA POWER
STANDARD PLAN NO. SU-05A	CITY ENGINEER		TACOMA WATER

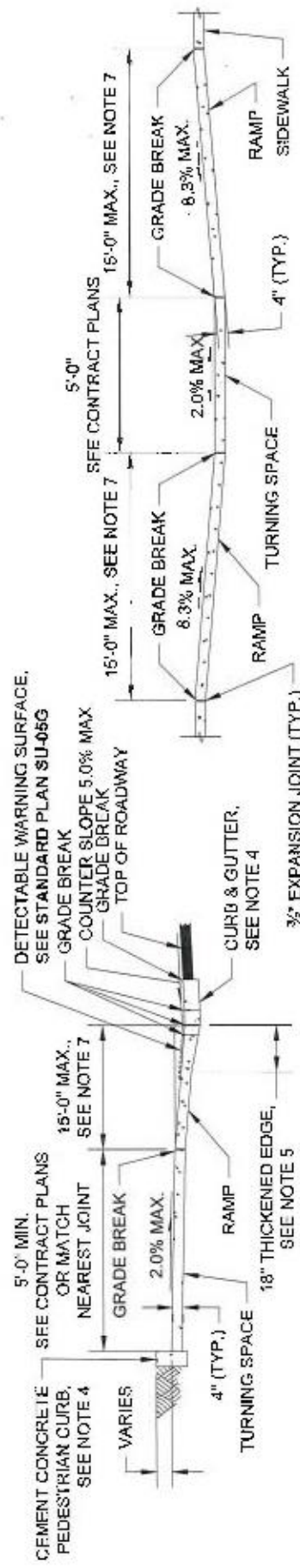
See Standard Plan SU-05 for referenced notes

LEGEND

— SLOPE IN EITHER DIRECTION



PLAN VIEW
(WITH PLANTER STRIP/LANDSCAPING)



SECTION DETAIL A-A



APPROVED FOR PUBLICATION

CITY OF TACOMA

PUBLIC WORKS	ENVIRONMENTAL SERVICES
NA	NA
TACOMA POWER	TACOMA WATER

COMBINATION CURB RAMP

TACOMA POWER

CITY ENGINEER

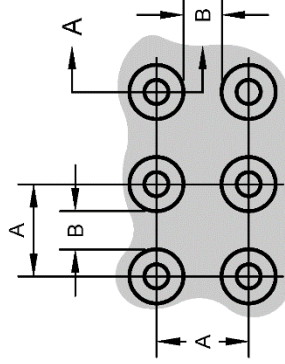
DATE _____

STANDARD PLAN NO.

SU-05C

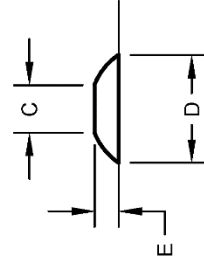
NOTES

1. The Detectable Warning Surface shall extend the full width of the curb ramp (exclusive of flares).
2. The rows of truncated domes in a Detectable Warning Surface shall be parallel with the direction of wheelchair travel.
3. See **Standard Plans SU-04** through **SU-05F** for sidewalk and curb ramp details.
4. If a curb is not present, place the Detectable Warning Surface at the edge of the pavement.
5. Detectable Warning Surfaces shall be either cast-in-place from Armor Tile, ADA Solutions, or an approved equal or surface applied from Vanguard or an approved equal. No detectable warning fasteners such as glue, bolts, or screws are allowed. Surface applied detectable warning surfaces may be used only when the curb ramp has associated features to deter vehicles from driving over the ramp area. Examples of such features include pedestrian curbing, utility/signal/streetlight poles, and fire hydrants.
6. Detectable warning surface shall be yellow and shall match SAE AMS Standard 595, Color 33538.
7. See **Standard Plan SU-05H** for Detectable Warning Surface placement guidelines.



TRUNCATED DOME DETAILS

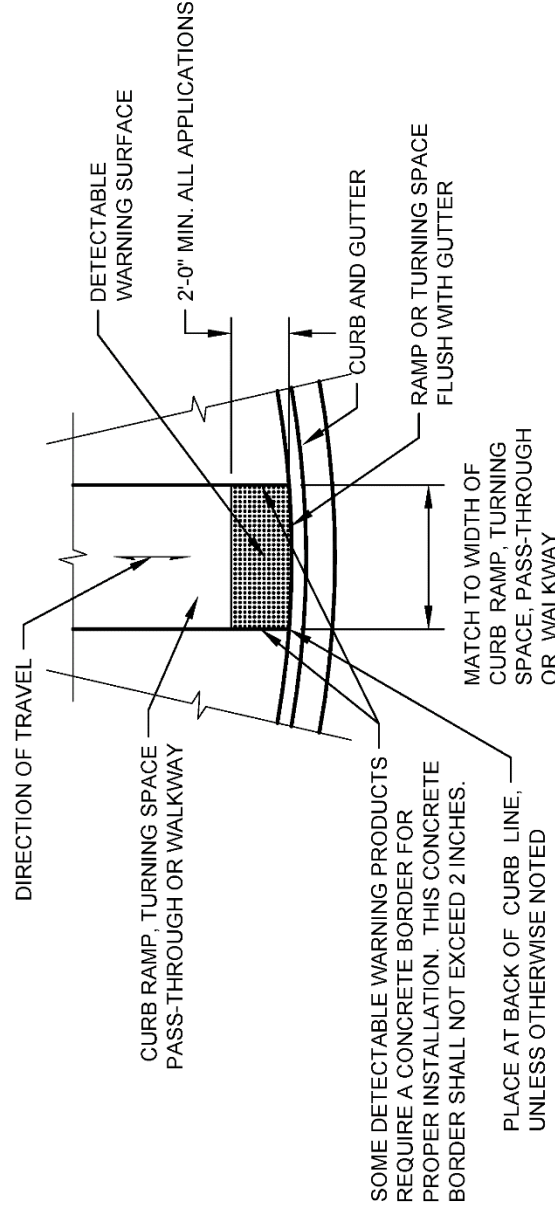
TRUNCATED DOME SPACING



	MIN.	MAX.
A	1.60"	2.40"
B	0.65"	-
C	0.45"	0.90"
D	0.90"	1.40"
E	0.20"	0.20"

SECTION DETAIL A-A

TRUNCATED DOME

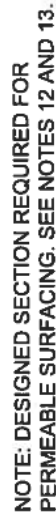


DETECTABLE WARNING SURFACE DETAIL

RVDR PUBLIC WORKS <i>[Signature]</i> TACOMA POWER	REVIEWED BY <i>[Signature]</i> ENVIRONMENTAL SERVICES <i>TS</i>		APPROVED FOR PUBLICATION <i>Kurtis King Solver</i> CITY ENGINEER	CITY OF TACOMA DETECTABLE WARNING SURFACE DETAILS STANDARD PLAN NO. SU-05G
	DATE 04/19/2021			

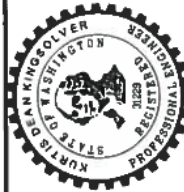
1. Type 1 access shall be used at driveways where the planting strip width is 5' or greater.

2. Standard Concrete shall be a minimum compressive strength of 3,000 PSI.
3. All joints shall be cleaned & edged. External joints to the driveway shall be 1/2" radius. Internal joints to the driveway shall be 1/4" radius.
4. Driveways wider or narrower than shown on this plan require approval of the Director of Public Works.
5. Standard concrete driveway section shall be a brushed finish in a transverse direction to the center line of driveway.
6. Driveways wider than 20' require a center line expansion joint.
7. All expansion or isolation joints shall be full depth.
8. When trenching through a driveway access:
 - 8.a. If driveway is 20' or less in width, a full driveway replacement is required.
 - 8.b. If driveway is greater than 20' in width, a minimum 2' wide cut back over undisturbed soil is required and replacement shall extend to the nearest control joint.
9. All joints shall be saw cut full depth prior to restoration and 3/8" expansion joint installed. 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.
10. Transition panel from new access to sidewalk shall be a minimum of 5 feet.
11. For driveway entrances within the North Slope Historical District area use Standard Plan HD-NS02. See Standard Plan HD-NS01 for map of Historical District area limits.
12. Permeable surfacing may be allowed for driveway entrances. Refer to Standard Plans PD-01 and PD-02 as applicable. Do not compact subgrade for permeable surfacing and refer to APWA GSP 2-06.3(3) Subgrade for Permeable Pavements. A soils report is required and modeling may be necessary per SWMM BMP L633.
13. Geomembrane barrier required between standard and permeable sections. Refer to City of Tacoma Standard Plan GSI-18.
14. Refer to Tacoma Municipal Code 10.14, driveways for additional information.
15. A 1-1/4" Ø PVC Sch. 80 Conduit shall be installed as shown, per TMC 10.14.070. Conduit shall be buried 24 inches below finished grade.



STANDARD CONCRETE SECTION DETAIL A-A

SIN

REVIEWED BY *CS*

PUBLIC WORKS
ENVIRONMENTAL
SERVICES

NA	NA
----	----

APPROVED FOR PUBLICATION

**CITY OF TACOMA
CEMENT CONCRETE
ACCESS**

TACOMA POWER

TACOMA WATER

CITY ENGINEER

DATE _____

STANDARD PLAN NO.

SU-07

3/8" EXPANSION JOINT (TYP.)
ISOLATION JOINT FOR
PERVIOUS CONCRETE (TYP.)

EX. SIDEWALK, TYP.

ALLEY WIDTH
DRIVEWAY WIDTH NON-SINGLE FAMILY
RESIDENCE / DUPLEX / TRIPLEX
24' MIN. TO 30' MAX
DRIVEWAY WIDTH SINGLE FAMILY
RESIDENCE / DUPLEX / TRIPLEX
14' MIN. TO 28' MAX

2"Ø PIPE, SEE
NOTES 12 AND
13 ON SU-07A
TRANSITION
PANEL, 5' MIN

DETECTABLE WARNING
SURFACE, SEE NOTE 14
ON SU-07A

DETECTABLE WARNING
SURFACE, SEE NOTE 14
ON SU-07A

6" (MIN) RESIDENTIAL
8" (MIN) COMMERCIAL AND ALLEY
3/4" LIP WITH 1/4" R.
3/8" EXPANSION JOINT
1 - 2% (MAX)

CRUSHED
SURFACING
SUITABLE COMPACTED
SUBGRADE

FOR SIDEWALK WIDTHS, SEE
STANDARD PLAN SU-04 AND
CONTRACT PLANS, OR MATCH
EXISTING, (TYP.)

PLANTING STRIP
LESS THAN 5'
ROADWAY PAVEMENT DISTURBED
DURING CONSTRUCTION OF DRIVEWAY
SHALL BE RESTORED IN ACCORDANCE
WITH STANDARD PLANS SU-14 OR SU-15.

NOTE: DESIGNED SECTION REQUIRED FOR PERMEABLE
SURFACING. SEE NOTES 10 AND 11 ON SU-07A.

STANDARD CONCRETE SECTION DETAIL A-A

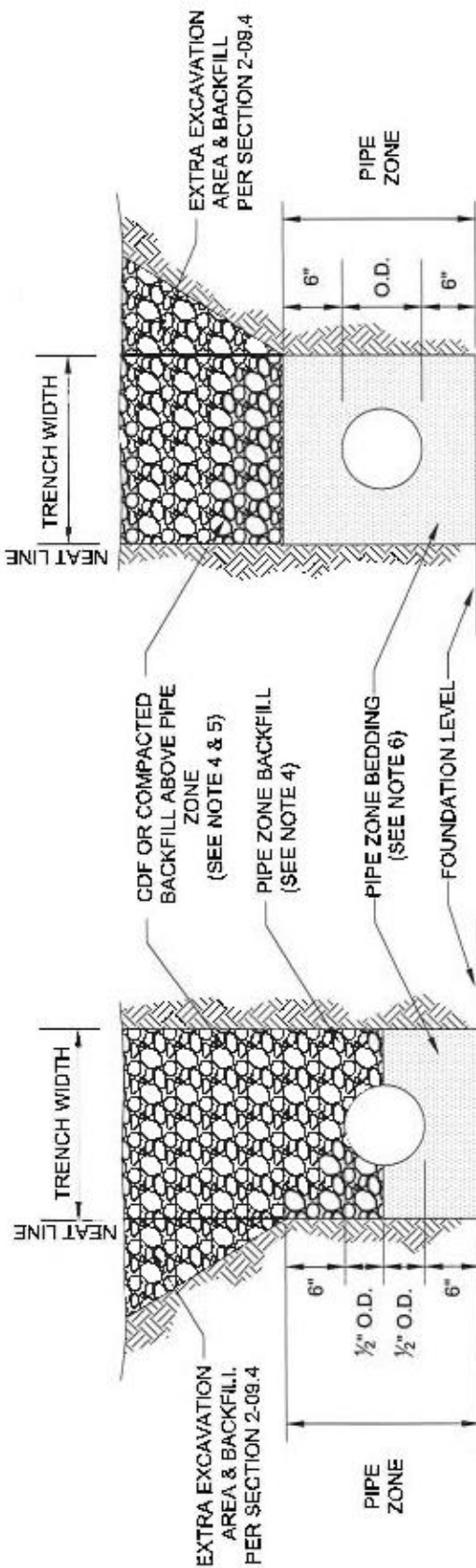
NTS

REVIEWED BY *gmk*
PUBLIC WORKS
ENVIRONMENTAL
SERVICES
N/A
TACOMA POWER
TACOMA WATER



APPROVED FOR PUBLICATION
[Signature]
CITY ENGINEER
DATE 8/22/17

CITY OF TACOMA
CEMENT CONCRETE DRIVEWAY
ENTRANCE AND ACCESS
TYPE 2
STANDARD PLAN NO. SU-08



RIGID PIPE

THERMOPLASTIC PIPE

NOTES:

1. Provide uniform support under barrel and provide pockets in bedding for pipe bells.
2. Hand tamp under haunches.
3. Trench width shall be as specified in Section 2-09.4 of the WSDOT Standard Specifications.
4. Pipe zone backfill and backfill above pipe zone shall meet the material requirements of WSDOT Standard Specification Section 9-03.12(2) for gravel backfill for walls.
5. All trenches shall be compacted in accordance with SU-28.
6. Pipe zone bedding shall meet the material requirements of WSDOT Standard Specification Section 9-03.9(3) for crushed surfacing top course.

REVIEWED BY **GMS**

PUBLIC WORKS ENVIRONMENTAL SERVICES

WA

TACOMA POWER



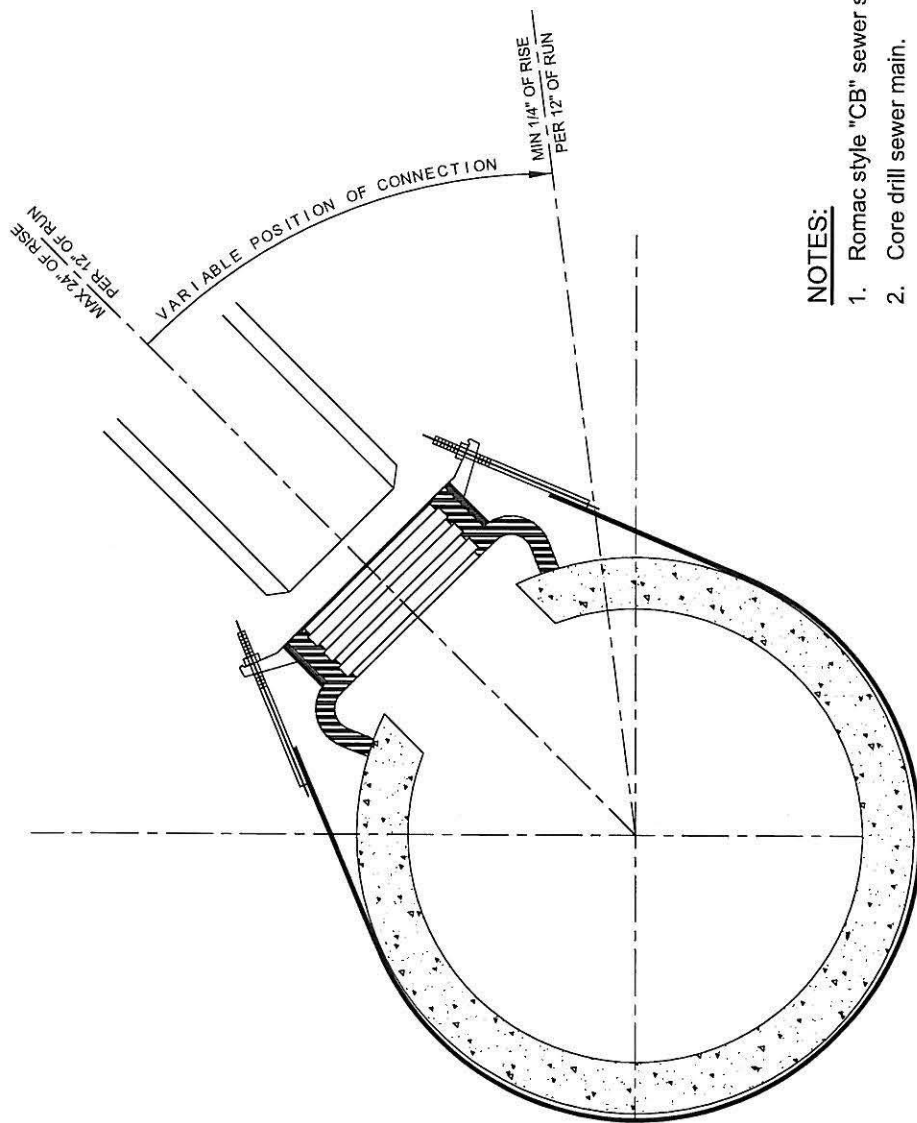
APPROVED FOR PUBLICATION

[Signature]
CITY ENGINEER

DATE

CITY OF TACOMA
PIPE ZONE BEDDING AND BACKFILL
FOR SANITARY AND STORM
SEWERS

STANDARD PLAN NO. SU-16



**SANITARY SEWER MAIN
CROSS SECTION**

NOTES:

1. Romac style "CB" sewer saddle or approved equal.
2. Core drill sewer main.
3. Portions of the City's sanitary sewer system have been lined. If a lined pipe is encountered during connection of the new side sewer, the Construction Division shall be contacted at (253) 591-5760 for further instructions.
4. Sewer laterals shall not extend beyond the interior wall of the sanitary sewer main.

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

APPROVED FOR PUBLICATION

James Parry
CITY ENGINEER

12 Jan 2009

DATE

LATERAL
SEWER CONNECTION TO
SANITARY SEWER MAIN

STANDARD PLAN NO. SU-23

PROGRESSION OF WORK

PRIOR TO EXCAVATING OR RESURFACING:

Contractor shall:

Remove frame and risers to a depth 8-inches below subgrade.
Install steel protective plate in accordance with Detail A.
Reference the location of the utility structure.

CONSTRUCTION OF SURFACING:

Gravel surfacing:

Install base materials and gravel over protective steel plate.

Asphalt surfacing:

Install base materials and asphalt over protective steel plate.

Concrete surfacing:

Adjust frame and grate to final grade prior to placing concrete surfacing.

UPON COMPLETION OF SURFACING:

The asphalt concrete pavement or gravel surfacing shall be removed in a neat circle in accordance with Detail B.

The location of the asphalt or gravel removal shall be based upon the reference location established by the Contractor.

Crushed surfacing and base materials shall be removed and disposed of to allow the removal of the steel protective plate.

The structure shall be adjusted to finish grade utilizing the same methods of construction as specified for new construction in Section 7-05.

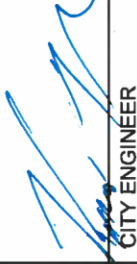
For hot mix asphalt, the area shall then be backfilled with Class 3000 cement concrete to an elevation of 3 to 4 inches below the finished pavement surface. 24-hours after placing the concrete, HMA pavement CL. 3/8" PG 64-22 shall be placed in accordance with Standard Plan No. SU-15.

For non-paved surfaces, the area shall be backfilled with Class 3000 cement concrete to an elevation of 3 to 4 inches below the top of the casting and then backfilled with crushed surfacing top course and compacted.

NOTE:

All general provisions, construction and warranty requirements of the Right of Way Restoration Policy will be followed.

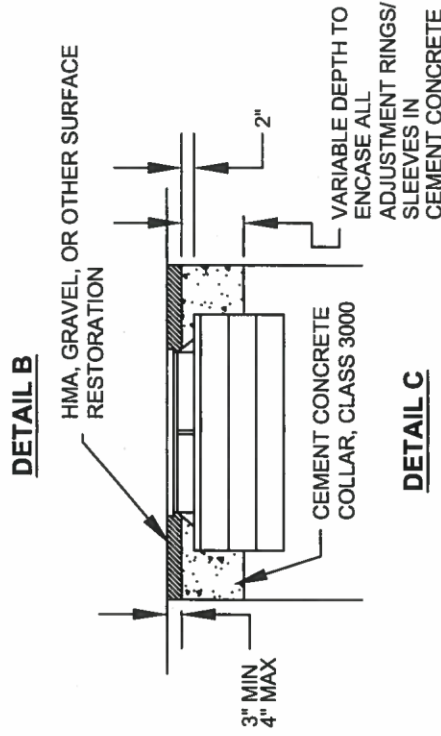
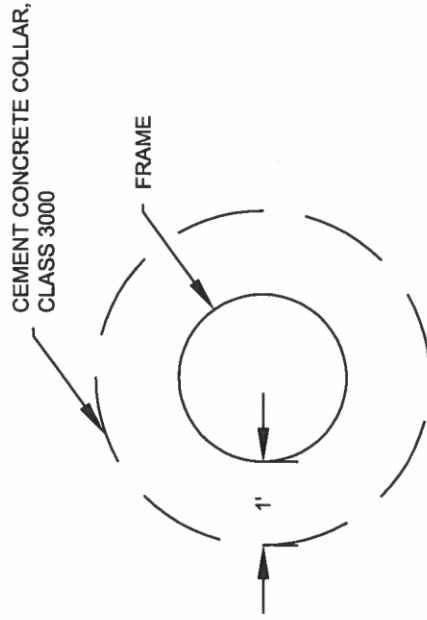
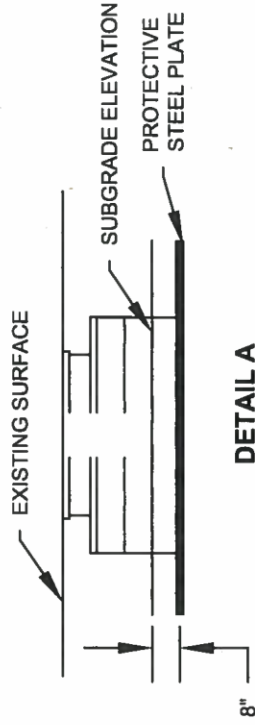
APPROVED FOR PUBLICATION


CITY ENGINEER
DATE 4/25/14

UTILITY ADJUSTMENT

STANDARD PLAN NO. SU-25

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS



COMPACTION TESTING REQUIREMENTS ^A			
DEPTH	TESTING FREQUENCY ^C		
	VERTICAL	HORIZONTAL	
SURFACE (BELOW HMA)	N/A	1 TEST EVERY 150 LINEAR FEET OF TRENCH OR MINIMUM 2 PER TRENCH	
		1 TEST FOR 150 SQUARE FEET FOR ISOLATED PATCHES ^B	
1 TO 4 FEET (OR MIN 18 IN. ABOVE PIPE)	1 EVERY 12 INCHES	SAME AS FOR SURFACE	
> 4 FEET TO BOTTOM OF TRENCH	NO SPECIFIC REQUIREMENT - MAY BE REQUIRED BY COT INSPECTOR FOR VERIFICATION OF COMPACTION		
<p>A. TESTING SHALL BE PERFORMED BY A CERTIFIED INDEPENDENT TESTING LABORATORY OR A CERTIFIED TESTOR AS APPROVED BY THE CITY'S CONSTRUCTION DIVISION. THE COST OF TESTING IS THE RESPONSIBILITY OF THE PERMITTEE. TESTS SHALL BE COMPLETED AND REPORTS IDENTIFYING THE PROJECT NUMBER SUBMITTED TO THE CONSTRUCTION DIVISION WITHIN 48 HOURS OF TESTS.</p> <p>B. ONLY ONE COMPACTION TEST WILL BE REQUIRED FOR MULTIPLE TRENCHES WITHIN A 150 SF AREA PROVIDED COMPACTION PROCEDURES ARE THE SAME.</p> <p>C. EACH LIFT SHALL BE COMPACTED TO 95% MODIFIED PROCTOR DENSITY, AS VERIFIED BY COMPACTION TESTING, BEFORE PROCEEDING TO THE NEXT LIFT. COT INSPECTOR MAY REQUIRE EXCAVATION AND REMOVAL OF SOIL WHERE COMPACTION IS IN QUESTION.</p>			

NOTES:

1. Compact backfill material in max. 12 in. lifts. Compact backfill material to 95% max. modified proctor density (ASTM 1557) except directly over pipe, hand tamp only.
2. Native backfill will require laboratory testing to determine max. modified proctor density. Imported backfill will require submittal of proctor test results from supplier.
3. See WSDOT Standard Specification Section 2-09.3(1)E for material requirements on "Controlled Density Fill" (CDF). CDF may be used for trenches less than 24 in. wide or as approved by the City Engineer. CDF shall be vibrated/compacted.

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

APPROVED FOR PUBLICATION

TRENCH BACKFILL
COMPACTION REQUIREMENTS

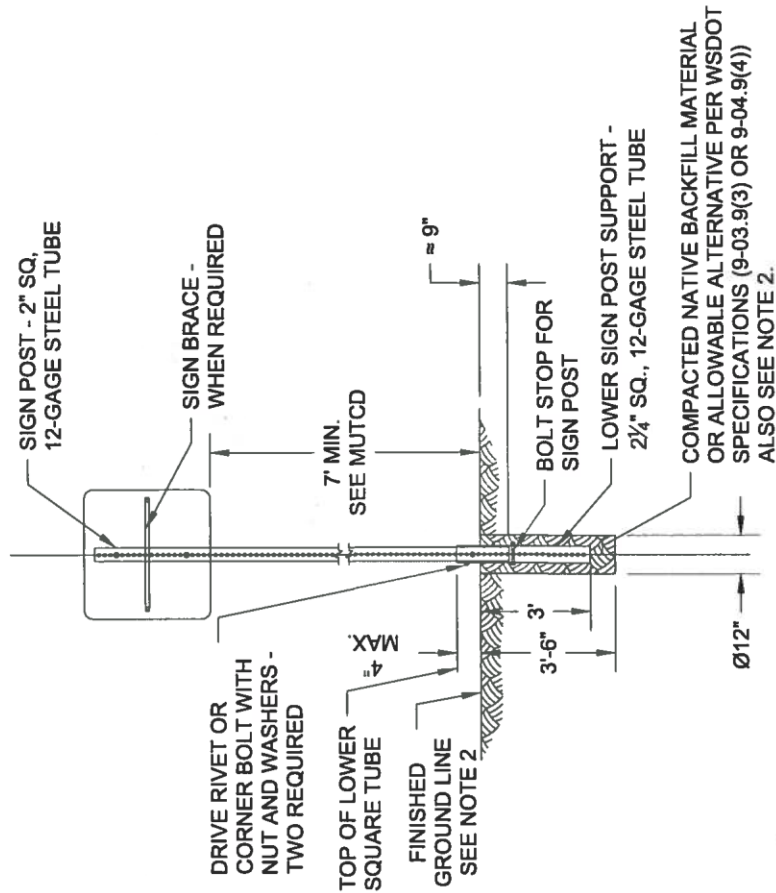
STANDARD PLAN NO. SU-28


CITY ENGINEER

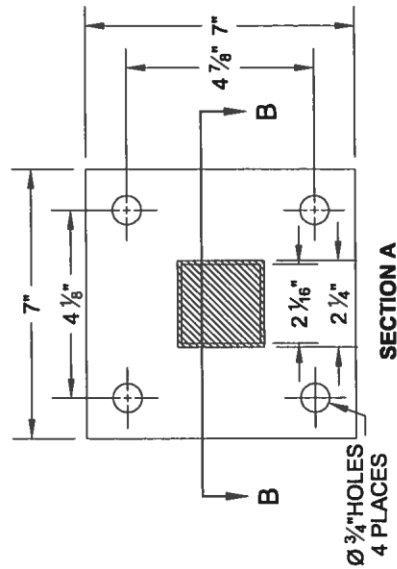
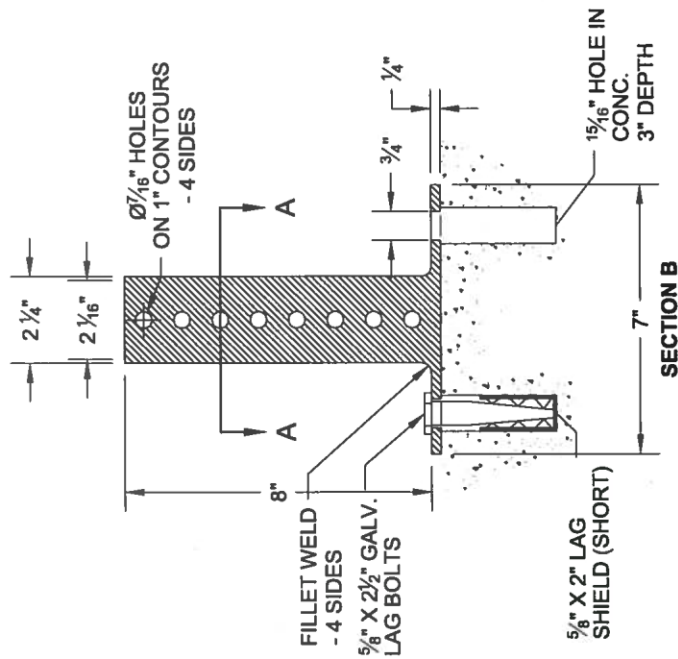
11/30/15
DATE

NOTES:

1. Surface mounting of sign posts, especially within traffic islands or medians, is only allowable with special authorization from the city's traffic engineering group. (Exception: Surface mounting of flexible post object markers within islands or medians is permitted).
2. If finished ground line is a hard surface, then compacted native backfill material shall be concrete with the top of foundation being smooth, dense, and uniform to finished ground line.



**SIGN SUPPORT DETAIL
FOR STEEL SIGN POST**



**BASE PLATE DETAIL FOR
STEEL SIGN POST SURFACE MOUNTING
(SEE NOTE 1)**

CITY OF TACOMA	APPROVED FOR PUBLICATION		<p>REVIEWED BY <i>gms</i></p> <p>PUBLIC WORKS <i>NA</i></p> <p>TACOMA POWER <i>NA</i></p> <p>ENVIRONMENTAL SERVICES <i>NA</i></p> <p>TACOMA WATER</p>
SIGN POST INSTALLATION	<p>CITY ENGINEER</p> <p><i>[Signature]</i></p> <p>DATE <i>4/4/11</i></p>		<p>STANDARD PLAN NO. SU-34</p>

PART V
EQUITY IN CONTRACTING

EIC REQUIREMENT FORM

EQUITY IN CONTRACTING REQUIREMENTS & PROCEDURES:

All bidders must complete and submit with their bid the following solicitation form contained in the bid submittal package:

City of Tacoma – EIC Utilization Form

IMPORTANT NOTE:

It is the bidder's responsibility to ensure that the subcontractor(s) listed on the EIC Utilization Form are currently certified by the State of Washington's Office of Minority and Women Business Enterprises (OMWBE) at the time of bid opening. This may be verified by contacting the EIC Office at 253-591-5075 between 8 AM and 5 PM, Monday through Friday or the [OMWBE](http://www.omwbe.com) Office at (866) 208-1064. Please refer to the City of Tacoma EIC code.

EQUITY IN CONTRACTING REQUIREMENTS

Minority Business
Enterprise Requirement

4%

Women Business
Enterprise Requirement

2%

Small Business Enterprise
Requirement

5%

A list of EIC-eligible companies is available on the following web site addresses:

www.omwbe.diversitycompliance.com*

MATERIAL MISSTATEMENTS CONCERNING COMPLETED ACTIONS BY THE BIDDER IN ANY SWORN STATEMENT OR FAILURE TO MEET COMMITMENTS AS INDICATED ON THE EIC UTILIZATION FORM MAY RENDER THE BIDDER IN DEFAULT OF CITY ORDINANCE 1.07

CCD/SBE: ENV-00116-04-06

Date of Record: 11/04/2022

Project Spec#: ES22-0204F

Project Title: Downtown Compactor Enclosure

*For the OMWBE list, be sure to look for businesses in Pierce, King, Lewis, Mason, Grays Harbor, Thurston, or any counties adjacent to the county in which the work is performed per 1.07.050(2)(b-c). Contact the EIC Office if you have any questions.



City of Tacoma
Community & Economic Development
Office of Equity in Contracting
747 Market Street, Rm 900
Tacoma WA 98402
253-591-5826
Email: EICOffice@cityoftacoma.org

EQUITY IN CONTRACTING UTILIZATION FORM

This form is to document **only** the contractors, subcontractors, material suppliers or other types of firms that are intended to be used to meet the stated EIC requirements for the contract awarded from this solicitation. This information will be used to determine contract award. Additional forms may be used if needed.

- You must include this form with your bid submittal in order for your bid to be responsive.
- Prime contractors are **required** to solicit bids from Businesses that are "Certified" by the Office of Minority and Women's Business Enterprises (OMWBE) www.omwbe.wa.gov as a MBE, WBE, and SBE to be known as "Certified Business".
- It is the Prime contractor's responsibility to verify the certification status of the business(s) intended to be utilized prior to the submittal deadline.

Bidder's Name: _____

Address: _____ City/State/Zip: _____

Spec. No. _____ Base Bid * \$ _____ **Complete business names and phone numbers are required to verify your usage of Certified Businesses**

a. Business Name and Certification Number(s)	b. MBE, WBE, or SBE (Write all that apply)	c. NAICS code(s)	d. Contractor Bid Amount (100%)	e. Material Supplier Bid Amount (20%)	f. Estimated MBE Usage Dollar Amount	g. Estimated WBE Usage Dollar Amount	h. Estimated SBE Usage Dollar Amount
i. MBE Utilization %	j. WBE Utilization %	k. SBE Utilization %					

By signing and submitting this form the bidder certifies that the OMWBE Certified Business(s) listed will be used on this project including all applicable change orders.

Type or Print Name of Responsible Officer / Title

Signature of Responsible Officer

Date

INSTRUCTIONS FOR COMPLETING EIC UTILIZATION FORM

The purpose of these instructions is to assist bidders in properly completing the EIC Utilization Form.

This form when submitted with your bid, provides information to the City of Tacoma to accurately review and evaluate your proposed EIC usage.

1. * Base Bid is the prime contractor's bid, plus any alternates, additives and deductibles selected by the City of Tacoma. Also, please refer to Items #10-12 below.
2. Column "a" – List all **Certified Business(s)** that you will be awarding a contract to if you are the successful bidder.
3. Column "b" – Identify if the **Certified Business(s)** is being utilized as an MBE, WBE, or SBE. (Businesses may count towards multiple requirements).
4. Column "c" – List the appropriate NAICS code(s) for the scope of work, services, or materials/supplies for each **Certified Business**.
5. Column "d" – The bid amount must be indicated for **all** listed **Certified Businesses** that you plan on doing business with. This quote is the price that you and the **Certified Businesses** have negotiated prior to bid opening.
6. Column "e" – The bid amount must be indicated for **all** listed **Certified Businesses** that you plan on doing business with. This quote is the price that you and the material supplier have negotiated prior to bid opening.
7. Column "f" – Estimated MBE Usage Dollar Amount: For all MBE firms used, multiply the amount in Column "d" by 1.0 plus the amount in Column "e" by 0.20. Insert the total amount in this column.
8. Column "g" – Estimated WBE Usage Dollar Amount: For all WBE firms used, multiply the amount in Column "d" by 1.0 plus the amount in Column "e" by 0.20. Insert the total amount in this column.
9. Column "h" – Estimated SBE Usage Dollar Amount: For all MBE, WBE, or SBE firms used, Multiply the amount in Column "d" by 1.0 plus the amount in Column "e" by 0.20. Insert the total amount in this column.
10. Block "i" – The percentage of actual MBE utilization calculated on the Base Bid only. (Divide the sum of Estimated MBE Usage Dollar Amount (Column "f") by your Base Bid (*) then multiply by 100 to get a percentage: \$ amounts from column "f" divided by Base Bid (*) x 100 = MBE usage as a percentage of the Base Bid.)
11. Block "j" – The percentage of actual WBE utilization calculated on the Base Bid only. (Divide the sum of Estimated WBE Usage Dollar Amount (Column "g") by your Base Bid (*) then multiply by 100 to get a percentage: \$ amounts from column "g" divided by Base Bid (*) x 100 = WBE usage as a percentage of the Base Bid.)

12. Block “k” – The percentage of actual SBE utilization calculated on the Base Bid only. (Divide the sum of Estimated SBE Usage Dollar Amount (Column “h”) by your Base Bid (*) then multiply by 100 to get a percentage: \$ amounts from column “h” divided by Base Bid (*) x 100 = SBE usage as a percentage of the Base Bid.)

It is the prime contractor’s responsibility to check the status of **Certified Businesses** prior to bid opening. Call the EIC Office at 253-591-5826 or email at EICOffice@cityoftacoma.org for additional information.



City of Tacoma
Community & Economic Development
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Tacoma WA 98402

CITY OF TACOMA EQUITY IN CONTRACTING (EIC) AND LEAP PROGRAMS

Bidders Special Instructions

As part of the City of Tacoma's ongoing work to address past disparities and to increase the City's contracting with and utilization of historically underutilized businesses, the Equity in Contracting (EIC) Program places requirements on City contracts for utilization of businesses certified by the Washington State Office of Minority and Women's Business Enterprise (OMWBE) and approved by the Equity in Contracting Program ("Certified Businesses"). The EIC Program also provides guidance and technical assistance to Certified Businesses who are interested in providing supplies, services and public works to the City of Tacoma.

The EIC Program requirements are contained in [Tacoma Municipal Code Chapter 1.07](#).

Contractors bidding on City of Tacoma projects are required to meet the stated EIC requirements. Bids will be evaluated on an individual basis to determine EIC compliance. **A contractor who fails to meet the stated EIC requirements will be considered non-responsible.** Bidders are also subject to the City's Equal Employment Opportunity policies prohibiting discrimination.

The stated EIC requirements may be met by the contractor or by identified subcontractors. All EIC Requirements may be met by using MBEs, WBEs, DBEs or SBEs from the OMWBE certified list ([OMWBE website](#)). It is the bidder's responsibility to ensure that their firm or identified subcontractors are certified by OMWBE and approved by the City of Tacoma EIC Program **at the time of bid submittal**. Business certification may be verified by contacting the EIC Office*.

For the OMWBE list, be sure to look for businesses in Pierce, King, Lewis, Mason, Grays Harbor, Thurston, or any counties adjacent to the county in which the work is performed per 1.07.050(2)(b-c). Contact the EIC Office if you have any questions.*

The Equity in Contracting (EIC) forms included in these bid documents must be fully completed (including attachments) and included with bid submittals. Failure to include the required forms will result in the submittal being rejected as nonresponsive.

Post-Award Important Information

For all contracts that have requirements related to the EIC and LEAP policies, the City of Tacoma is utilizing two cloud-based software systems:

- **B2Gnow** - Contractors and subcontractors must report payment information in the B2Gnow System on a monthly basis. The EIC Staff will monitor/audit that retainage is paid by the prime contractor to the subcontractor(s) within 10 [working] days after the subcontractors' work is satisfactorily completed. This will be monitored/audited using the B2Gnow System.
- **LCP Tracker** - This system must be used for submitting certified payroll(s) for both EIC and LEAP compliance.



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Both systems are monitored/audited by EIC and LEAP staff to ensure contract compliance, proactively identify potential issues and track contract progress.

***EIC & LEAP STAFF Contact Information**

- **For questions regarding Certifications, EIC Compliance and B2GNow support, contact EIC Staff:**
Malika Godo at (253) 591-5630, or via email at mgodo@cityoftacoma.org
Gary Lizama at (253) 591-5826, or via email at glizama@cityoftacoma.org
- **For questions in regards to LEAP compliance and LCP Tracker support, contact LEAP Staff:**
Deborah Trevorrow at (253) 591-5590, or via email at dtrevorrow@cityoftacoma.org

CHAPTER 1.07

EQUITY IN CONTRACTING

Sections:

- 1.07.010 Policy and purpose.
- 1.07.020 Definitions.
- 1.07.030 Discrimination prohibited.
- 1.07.040 Program administration.
- 1.07.050 Approval as a Certified Business.
- 1.07.060 Program requirements.
- 1.07.070 Evaluation of submittals.
- 1.07.080 Contract compliance.
- 1.07.090 Program monitoring.
- 1.07.100 Enforcement.
- 1.07.110 Remedies.
- 1.07.120 Unlawful acts.
- 1.07.130 Severability.
- 1.07.140 Review of program.

1.07.010 Policy and purpose.

It is the policy of the City of Tacoma that citizens be afforded an opportunity for full participation in our free enterprise system and that historically underutilized business enterprises shall have an equitable opportunity to participate in the performance of City contracts. The City finds that in its contracting for supplies, services and public works, there has been historical underutilization of small and minority-owned businesses located in certain geographically and economically disfavored locations and that this underutilization has had a deleterious impact on the economic well-being of the City. The purpose of this chapter is to remedy the effects of such underutilization through use of narrowly tailored contracting requirements to increase opportunities for historically underutilized businesses to participate in City contracts. It is the goal of this chapter to facilitate a substantial procurement, education, and mentorship program designed to promote equitable participation by historically underutilized businesses in the provision of supplies, services, and public works to the City. It is not the purpose of this chapter to provide any person or entity with any right, privilege, or claim, not shared by the public, generally, and this chapter shall not be construed to do so. This chapter is adopted in accordance with Chapter 35.22 RCW and RCW 49.60.400.

(Ord. 28625 Ex. A; passed Nov. 5, 2019; Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.020 Definitions.

Terms used in this chapter shall have the following meanings unless defined elsewhere in the Tacoma Municipal Code (“TMC”), or unless the context in which they are used clearly indicates a different meaning.

1.07.020.B

A. “Bid” means an offer submitted by a Respondent to furnish Supplies, Services, and/or Public Works in conformity with the Specifications and any other written terms and conditions included in a City request for such offer.

B. “Bidder” means an entity or individual who submits a Bid, Proposal or Quote. See also “Respondent.”

1.07.020.C

“Certified Business” means an entity that has been certified as a Disadvantaged Business Enterprise (“DBE”), Small Business Enterprise (“SBE”), Minority Business Enterprise (“MBE”), Women Business Enterprise (“WBE”), or Minority and Women’s Business Enterprise (“MWBE”) by the Washington State Office of Minority and Women’s Business Enterprise and meets the criteria set forth in Section 1.07.050 (2) of this chapter and has been approved as meeting that criteria by the Community and Economic Development Department Program Manager.

“City” means all Departments, Divisions and agencies of the City of Tacoma.

“Contract” means any type of legally binding agreement regardless of form or title that governs the terms and conditions for procurement of Public Works and Improvements and/or Non-Public Works and Improvements Supplies and Services. Contracts include the terms and conditions found in Specifications, Bidder or Respondent Submittals, and purchase orders issued by the City. A “Contract” as used in this chapter shall include an agreement between the City and a non-profit entity to perform construction-related services for Public Works. A “Contract” does not include: (1) awards made by the City with

federal/state grant or City general funds monies to a non-profit entity where the City offers assistance, guidance, or supervision on a project or program, and the recipient of the grant awards uses the grant moneys to provide services to the community; (2) sales transactions where the City sells its personal or real property; (3) a loan transaction where the City is acting as a debtor or a creditor; (4) lease, franchise; (5) agreements to use City real property (such as Licenses, Permits and Easements) and, (6) banking and other financial or investment services.

“Contractor” means any Person that presents a Submittal to the City, enters into a Contract with the City, and/or performs all or any part of a Contract awarded by the City, for the provision of Public Works, or Non-Public Works and Improvements, Supplies or Services.

1.07.020.G

“Goals” means the annual level of participation by Certified Businesses in City Contracts as established in this chapter, the Program Regulations, or as necessary to comply with applicable federal and state nondiscrimination laws and regulations. Goals for individual Contracts may be adjusted as provided for in this chapter and shall not be construed as a minimum for any particular Contract or for any particular geographical area.

1.07.020.N

“Non-Public Works and Improvements” means all competitively solicited procurement of Supplies and/or Services by the City not solicited as Public Works.

1.07.020.P

“Person” means individuals, companies, corporations, partnerships, associations, cooperatives, any other legally recognized business entity, legal representative, trustee, or receivers.

“Program Manager” means the individual appointed, from time to time, by the City’s Community and Economic Development Director to administer the Program Regulations.

“Program Regulations” means the written regulations and procedures adopted pursuant to this chapter for procurement of Supplies, Services and Public Works.

“Proposal” means a written offer to furnish Supplies or Services in response to a Request for Proposals. This term may be further defined in the Purchasing Policy Manual and/or in competitive solicitations issued by the City.

“Public Works (or “Public Works and Improvements)” means all work, construction, alteration, repair, or improvement other than ordinary maintenance, executed at the cost of the City, or that is by law a lien or charge on any property therein. This term includes all Supplies, materials, tools, and equipment to be furnished in accordance with the Contract for such work, construction, alteration, repair, or improvement.

1.07.020.Q

“Quote” means a competitively solicited written offer to furnish Supplies or Services by a method of procurement that is less formalized than a Bid or a Proposal. This term may be further defined in the Purchasing Policy Manual.

1.07.020.R

“Respondent” means any entity or Person, other than a City employee, that provides a Submittal in response to a request for Bids, Request for Proposals, Request for Qualifications, request for quotes or other request for information, as such terms are defined in Section 1.06.251 TMC. This term includes any such entity or Person whether designated as a supplier, seller, vendor, proposer, Bidder, Contractor, consultant, merchant, or service provider that; (1) assumes a contractual responsibility to the City for provision of Supplies, Services, and/or Public Works; (2) is recognized by its industry as a provider of such Supplies, Services, and/or Public works; (3) has facilities similar to those commonly used by Persons engaged in the same or similar business; and/or (4) distributes, delivers, sells, or services a product or performs a Commercially Useful Function.

1.07.020.S

“Services” means non-Public Works and Improvements services and includes professional services, personal services, and purchased services, as such terms are defined in Section 1.06.251 TMC and/or the City’s Purchasing Policy Manual.

“Submittal” means Bids, Proposals, Quotes, qualifications or other information submitted in response to requests for Bids, Requests for Proposals, Requests for Qualifications, requests for Quotations, or other City requests for information, as such terms are defined in Section 1.06.251 TMC.

“Supplies” means materials, Supplies, and other products that are procured by the City through a competitive process for either Public Works procurement or Non-Public Works and Improvements procurement unless an approved waiver has been granted by the appropriate authority.

1.07.020.T

“Tacoma Public Utilities Service Area” means any ZIP code in which Tacoma Public Utilities maintains infrastructure or provides retail services.

1.07.020.W

“Waiver” means a discretionary decision by the City that the one or more requirements of this chapter will not be applied to a Contract or Contracts.

(Ord. 28766 Ex. A; passed June. 8, 2021: Ord. 28625 Ex. A; passed Nov. 5, 2019: Ord. 28274 Ex. A; passed Dec. 16, 2014: Ord. 28141 Ex. A; passed Mar. 26, 2013: Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.030 Discrimination prohibited.

A. No person that is engaged in the construction of public works for the City, engaged in the furnishing of laborers or craftspeople for public works of the City, or is engaged for compensation in the provision of non-public works and improvements supplies and/or services to the City, shall discriminate against any other person on the basis of race, religion, color, national origin or ancestry, sex, gender identity, sexual orientation, age, marital status, familial status, or the presence of any sensory, mental or physical disability in employment. Such discrimination includes the unfair treatment or denial of normal privileges to a person as manifested in employment upgrades, demotions, transfers, layoffs, termination, rates of pay, recruitment of employees, or advertisement for employment.

B. The violation of the terms of RCW 49.60 or Chapter 1.29 TMC by any person that is engaged in the construction of public works for the City, is engaged in the furnishing of laborers or craftspeople for public works of the City, or is engaged for compensation in the provision of non-public works and improvements supplies and/or services shall result in the rebuttable presumption that the terms of this chapter have also been violated. Such violation may result in termination of any City contract the violator may have with the City and/or the violator’s ineligibility for further City Contracts.

(Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.040 Program administration.

A. The Community and Economic Development Director, or their designated Program Manager, shall be responsible for administering this chapter and obtaining compliance with respect to contracts entered into by the City and/or its contractors. It shall be the duty of the Director to pursue the objectives of this chapter by conference, conciliation, persuasion, investigation, or enforcement action, as may be necessary under the circumstances. The Director is authorized to implement an administrative and compliance program to meet these responsibilities and objectives.

B. The Director is hereby authorized to adopt and to amend administrative regulations known as the Program Regulations, to properly implement and administer the provisions of this chapter. The Program Regulations shall be in conformance with City of Tacoma policies and state and federal laws and be designed to encourage achievement of the Goals set forth herein.

(Ord. 28766 Ex. A; passed June. 8, 2021: Ord. 28141 Ex. A; passed Mar. 26, 2013: Ord. 28110 Ex. B; passed Dec. 4, 2012: Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.050 Approval as a Certified Business.

A. The Program Manager shall approve an entity as a Certified Business if all of the following criteria are satisfied:

1. The entity is certified as a DBE, SBE, MBE, WBE, or MWBE through the state of Washington’s Office of Minority & Women Business Enterprises; and
2. The entity can demonstrate that it also meets at least one of the following additional requirements:
 - a. The personal residence of the owner is located within the City of Tacoma or Tacoma Public Utilities Service Area, or
 - b. The entity’s business offices are located in any county of the Tacoma Public Utilities Service Area or any county adjacent to Pierce County, or
 - c. When the work is performed outside of Pierce County, the entity’s business offices may be located in an adjacent county in which the work is performed, or
 - d. Such additional information as the Program Manager or designee may require.
3. When another governmental entity has an equivalent business classification process, the City may enter into an interlocal cooperative agreement for mutual recognition of certifications.

B. Appeals.

The applicant may appeal any approval determination by the Program Manager under this chapter to the Director. The appeal must be made in writing and must set forth the specific reasons for the appeal. The Director shall make a decision on the appeal request within a reasonable time, which decision shall be final unless further appeal is made to the Hearing Examiner. In that event, the Hearing Examiner Rules of Procedure for Hearings, Chapter 1.23 TMC, shall be applicable to that appeal proceeding.

(Ord. 28766 Ex. A; passed June. 8, 2021: Ord. 28625 Ex. A; passed Nov. 5, 2019: Ord. 28274 Ex. A; passed Dec. 16, 2014: Ord. 28147 Ex. A; passed May 7, 2013: Ord. 28141 Ex. A; passed Mar. 26, 2013: Ord. 28110 Ex. B; passed Dec. 4, 2012: Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.060 Program requirements.

A. The program shall meet the following requirements:

1. Establishment of Annual Goals.

The Program Regulations adopted pursuant to this chapter shall state reasonably achievable cumulative annual goals for utilization of Certified Businesses in the provision of supplies, services, and public works procured by the City. Cumulative annual goals for the participation of Certified Businesses in City contracts shall be based on the number of qualified Certified Businesses operating within the Tacoma Public Utilities Service Area. The dollar value of all contracts awarded by the City to Certified Businesses in the procurement of supplies, services, and public works shall be counted toward the accomplishment of the applicable goal.

2. Application of Annual Goals to Contracts.

The Program Manager shall consult with City departments/divisions to establish department/division specific goals for competitively solicited contracts in accordance with this chapter and the Program Regulations.

B. Exceptions:

City departments/divisions or the Program Manager may request an exception to one or more of the requirements of this chapter as they apply to a particular Contract or Contracts. Exceptions may be granted in any one or more of the following circumstances:

1. Emergency:

The supplies, services and/or public works must be provided with such immediacy that neither the City nor the contractor can comply with the requirements herein. Such emergency will be deemed documented whenever a waiver of competitive solicitation for emergency situations is authorized under Tacoma Municipal Code Chapter 1.06.257 or as may be hereinafter amended.

2. Not Practicable:

The Contract involves special facilities or market conditions or specially tailored or performance criteria-based products, such that compliance with the requirements of this chapter would cause financial loss to the City or an interruption of vital services to the public. Such circumstances must be documented by the department/division awarding the Contract and approved by the senior financial manager or, for Contracts where the estimated cost is over \$500,000 (excluding sales tax), approved by the Board of Contracts and Awards ("C&A Board").

3. Sole source:

The supplies, services, and/or public works are available from only one feasible source, and subcontracting possibilities do not reasonably exist as documented by the department/division awarding the Contract and approved by the senior financial manager or, for Contracts where the estimated cost is over \$500,000 (excluding sales tax), approved by the C&A Board.

4. Government purchasing.

The Contract or Contracts are the result of a federal, state or inter-local government purchasing agreement and the use of such agreement in lieu of a bid solicitation conducted by the City is approved by the senior financial manager.

5. Lack of certified contractors:

An insufficient number of qualified contractors exist to create any utilization opportunities as documented by the Program Manager.

C. Waiver:

If, after receipt of Submittals but prior to Contract award, it is determined that due to unforeseen circumstances, waiver of goals is in the best interests of the City, the Director or Superintendent of the department/division awarding the Contract may request in writing that the City Manager or designee, on behalf of General Government, or the Director of Utilities or designee, on behalf of the Department of Public Utilities, approve such waiver..

Waivers may be granted only after determination by the City Manager or Director of Utilities that compliance with the requirements of this chapter would impose unwarranted economic burden on, or risk to, the City of Tacoma as compared with the degree to which the purposes and policies of this chapter would be furthered by requiring compliance.

(Ord. 28766 Ex. A; passed June. 8, 2021: Ord. 28625 Ex. A; passed Nov. 5, 2019: Ord. 28141 Ex. A; passed Mar. 26, 2013: Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.070 Evaluation of submittals.

A. All submittals for a supplies, services, or public works and improvements contracts shall be evaluated for attainment of the Certified Business requirements established for that contract in accordance with this chapter and the Program Regulations.

B. The determination of Certified Business usage and the calculation of Certified Business requirements per this section shall include the following considerations:

1. General.

The dollar value of the contract awarded by the City to a Certified Business in the procurement of supplies, services, or public works shall be counted toward achievement of the respective goal.

2. Supplies.

A public works and improvements contractor may receive credit toward attainment of the Certified Business requirement(s) for expenditures for supplies obtained from a Certified Business; provided such Certified Business assumes the actual and contractual responsibility for delivering the supplies with its resources. The contractor may also receive credit toward attainment of the Certified Business goal for the amount of the commission paid to a Certified Business resulting from a supplies contract with the City; provided the Certified Business performs a commercially useful function in the process.

3. Services and Public Works subcontracts.

Any bid by a Certified Business or a bidder that utilizes a Certified Business shall receive credit toward requirement attainment based on the percentage of Certified Business usage demonstrated in the bid. A contractor that utilizes a Certified Business as a subcontractor to provide services or public works shall receive a credit toward the contractor's attainment of the respective requirement based on the value of the subcontract with that firm.

4. Brokers, Fronts, or Similar Pass-Through Arrangements.

Certified Business acting as brokers, fronts, or similar pass-through arrangements (as such terms are defined in the Program Regulations) shall not count toward the requirement attainment unless the activity reflects normal industry practices and the broker performs a commercially useful function.

C. Evaluation of competitively solicited submittals for public works and improvements and for services when a requirement has been established for the contract to be awarded shall be as follows:

1. When contract award is based on price.

The lowest priced bid submitted by a responsive and responsible bidder will be reviewed to determine if it meets the requirement. Certified Businesses may self-count utilization on such bids if they will perform the work for the scope the requirement is based upon.

a. If the low bidder meets the requirements, the bid shall be presumed the lowest and best responsible bid for contract award.

b. Any bidder that does not meet the stated Certified Business requirements shall be considered a non-responsible bidder unless a waiver of one or more of the requirements of this chapter is granted, in the City's sole discretion, pursuant to the criteria and processes in Tacoma Municipal Code 1.07.060.C.

2. When contract award is based on qualifications or other performance criteria in addition to price, solicitations shall utilize a scoring system that promotes participation by certified contractors. The Program Regulations may establish further requirements and procedures for final selection and contract award, including:

a. Evaluation of solicitations for Architectural and Engineering (A&E) services;

b. Evaluation and selection of submittals in response to requests for proposals; and

c. Selection of contractors from pre-qualified roster(s).

(Ord. 28766 Ex. A; passed Jun. 8, 2021: Ord. 28625 Ex. A; passed Nov. 5, 2019: Ord. 28141 Ex. A; passed Mar. 26, 2013: Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.080 Contract compliance.

A. The contractor awarded a contract based on Certified Business participation shall, during the term of the contract, comply with the requirements established in said contract. To ensure compliance with this requirement following contract award, the following provisions apply:

1. Any substitutions for or failure to utilize Certified Business projected to be used must be approved in advance by the Program Manager. Substitution of one Certified Business with another shall be allowed where there has been a refusal to execute necessary agreements by the original Certified Business, a default on agreements previously made or other reasonable excuse; provided that the substitution does not increase the dollar amount of the bid.
2. Where it is shown that no other Certified Business is available as a substitute and that failure to secure participation by the Certified Business identified in the solicitation is not the fault of the respondent, substitution with a non-Certified Business shall be allowed; provided, that, the substitution does not increase the dollar amount of the bid.
3. If the Program Manager determines that the contractor has not reasonably and actively pursued the use of replacement Certified Business, such contractor shall be deemed to be in non-compliance.

B. Record Keeping.

All contracts shall require contractors to maintain relevant records and information necessary to document compliance with this chapter and the contractor's utilization of Certified Businesses, and shall include the right of the City to inspect such records.

(Ord. 28766 Ex. A; passed Jun. 8, 2021: Ord. 28625 Ex. A; passed Nov. 5, 2019: Ord. 28141 Ex. A; passed Mar. 26, 2013: Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.090 Program monitoring.

A. An Advisory Committee shall monitor compliance with all provisions of this chapter and the related Regulations. The Program Manager shall establish procedures to collect data and monitor the effect of the provisions of this chapter to assure, insofar as is practical, that the remedies set forth herein do not disproportionately favor one or more racial, gender, ethnic, or other protected groups, and that the remedies do not remain in effect beyond the point that they are required to eliminate the effects of under utilization in City contracting, unless such provisions are supported by a Disparity Study. The Program Manager shall have the authority to obtain from City departments/divisions, respondents, and contractors such relevant records, documents, and other information as is reasonably necessary to determine compliance.

B. The Program Manager shall submit an annual report to the Community and Economic Development Director, Director of Utilities, and the City Manager detailing performance of the program. The report shall document Certified Business utilization levels, waivers, proposed modifications to the program, and such other matters as may be specified in the Program Regulations.

(Ord. 28766 Ex. A; passed Jun. 8, 2021: Ord. 28625 Ex. A; passed Nov. 5, 2019: Ord. 28141 Ex. A; passed Mar. 26, 2013: Ord. 28110 Ex. B; passed Dec. 4, 2012: Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.100 Enforcement.

The Director, or designee, may investigate the employment practices of contractors to determine whether or not the requirements of this chapter have been violated. Such investigation shall be conducted in accordance with the procedures established in the Program Regulations.

(Ord. 28625 Ex. A; passed Nov. 5, 2019: Ord. 28141 Ex. A; passed Mar. 26, 2013: Ord. 28110 Ex. B; passed Dec. 4, 2012: Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.110 Remedies.

A. Upon receipt of a determination of contractor violation by the Program Manager, the City Manager or Director of Utilities, as appropriate, may take the following actions, singly or together, as appropriate:

1. Forfeit the contractor's bid bond and/or performance bond;

2. Publish notice of the contractor's noncompliance;
3. Cancel, terminate, or suspend the contractor's contract, or portion thereof;
4. Withhold funds due contractor until compliance is achieved; and/or
5. Recommend appropriate action including, but not limited to, disqualification of eligibility for future contract awards by the City (debarment) per Section 1.06.279 TMC;

B. Prior to exercise of any of the foregoing remedies, the City shall provide written notice to the contractor specifying the violation and the City's intent to exercise such remedy or remedies. The notice shall provide that each specified remedy becomes effective within ten business days of receipt unless the contractor appeals said action to the Hearing Examiner pursuant to Chapter 1.23 TMC.

C. When non-compliance with this chapter or the Program Regulations has occurred, the Program Manager and the department/division responsible for enforcement of the contract may allow continuation of the contract upon the contractor's development of a plan for compliance acceptable to the Director.

(Ord. 28625 Ex. A; passed Nov. 5, 2019; Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 28110 Ex. B; passed Dec. 4, 2012; Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.120 Unlawful acts.

It shall be unlawful for any Person to willfully prevent or attempt to prevent, by intimidation, threats, coercion, or otherwise, any Person from complying with the provisions of this chapter.

(Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.130 Severability.

If any section of this chapter or its application to any Person or circumstance is held invalid by a court of competent jurisdiction, then the remaining sections of this chapter, or the application of the provisions to other Persons or circumstances, shall not be affected.

(Ord. 27867 Ex. A; passed Dec. 15, 2009)

1.07.140 Review of program.

This chapter shall be in effect through and until December 31, 2024, unless the City Council shall determine at an earlier date that the requirements of this chapter are no longer necessary. If this chapter has not been repealed by July 1, 2024, the City Council shall determine by the end of that year whether substantial effects or lack of opportunity of MWBEs and/or SBEs remain true in the relevant market and whether, and for how long, some or all of the requirements of this chapter should remain in effect.

(Ord. 28625 Ex. A; passed Nov. 5, 2019; Ord. 28274 Ex. A; passed Dec. 16, 2014; Ord. 28141 Ex. A; passed Mar. 26, 2013; Ord. 27867 Ex. A; passed Dec. 15, 2009)

PART VI
Local Employment and Apprenticeship Training Program (LEAP)
Regulations for Public Works Contracts

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:

- *LEAP Employee Verification Form.* This form is to be completed for employees who may be LEAP-Qualified and may be able to help meet the LEAP Goals.
- *LEAP Weekly Payroll.* These must be submitted via LCP Tracker. By submitting payrolls in LCP Tracker before the Labor & Industry's website, you can reduce data entry.

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 below \$1 million and is thusly subject to the:

1. 15% Local Employment 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
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. Based on the dollar amounts of projects, it requires Prime Contractors performing qualifying public works projects or service contracts ensure that a percentage of the total labor hours worked on the project are performed by LEAP-Qualified local employees and/or LEAP-Qualified 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 (as outlined below). Compliance may be met through any combination LEAP-Qualified employees.

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 Prime 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 an additional 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. *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 LEAP Utilization requirements with at least one piece of verifying documentation. The LEAP Office staff will respond regarding whether or not the employee is LEAP-Qualified.
2. *WEEKLY CERTIFIED PAYROLL*: In LCP Tracker: 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.
3. *DEPARTMENT OF LABOR & INDUSTRIES (L&I)*: The Prime must enter the project in the L&I project site under the 'Tacoma, City of' account 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



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
- ❑ **LEAP Employee Verification Form:** to be submitted on an ongoing basis for each employee who may be a LEAP-qualified employee
- ❑ **Tacoma Public Utilities Service Area Map and List, Economically Distressed ZIP Codes Map and List:** 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 LEAP Office
747 Market Street, Room 900
Tacoma, WA 98402
(253) 591-5590 or 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*): _____

Age: _____ 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 (journey level or certified apprentice) within the geographic boundaries of the City of Tacoma

_____ b. Resident (journey level or certified apprentice) within Economically Distressed ZIP Codes of the Tacoma Public Utilities Service Area

_____ c. WA State Approved Apprentice living in the Tacoma Public Utilities Service Area (Only valid for projects over \$1,000,000)

_____ 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 one or more of the following document(s) showing the address of residence as proof of local (Tacoma) and/or Economically Distressed Area and/or TPU Service Areas residency. For youth, see first line and for veteran status, see second line.

.....

_____ 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(Projects advertised after
_____ 05-20-13)

_____ 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.

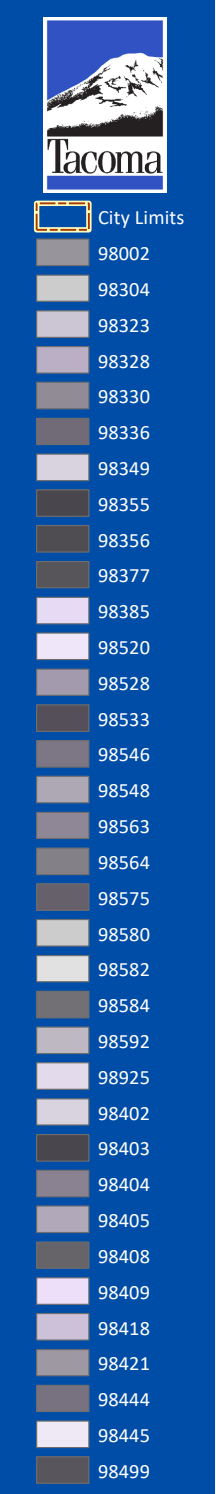
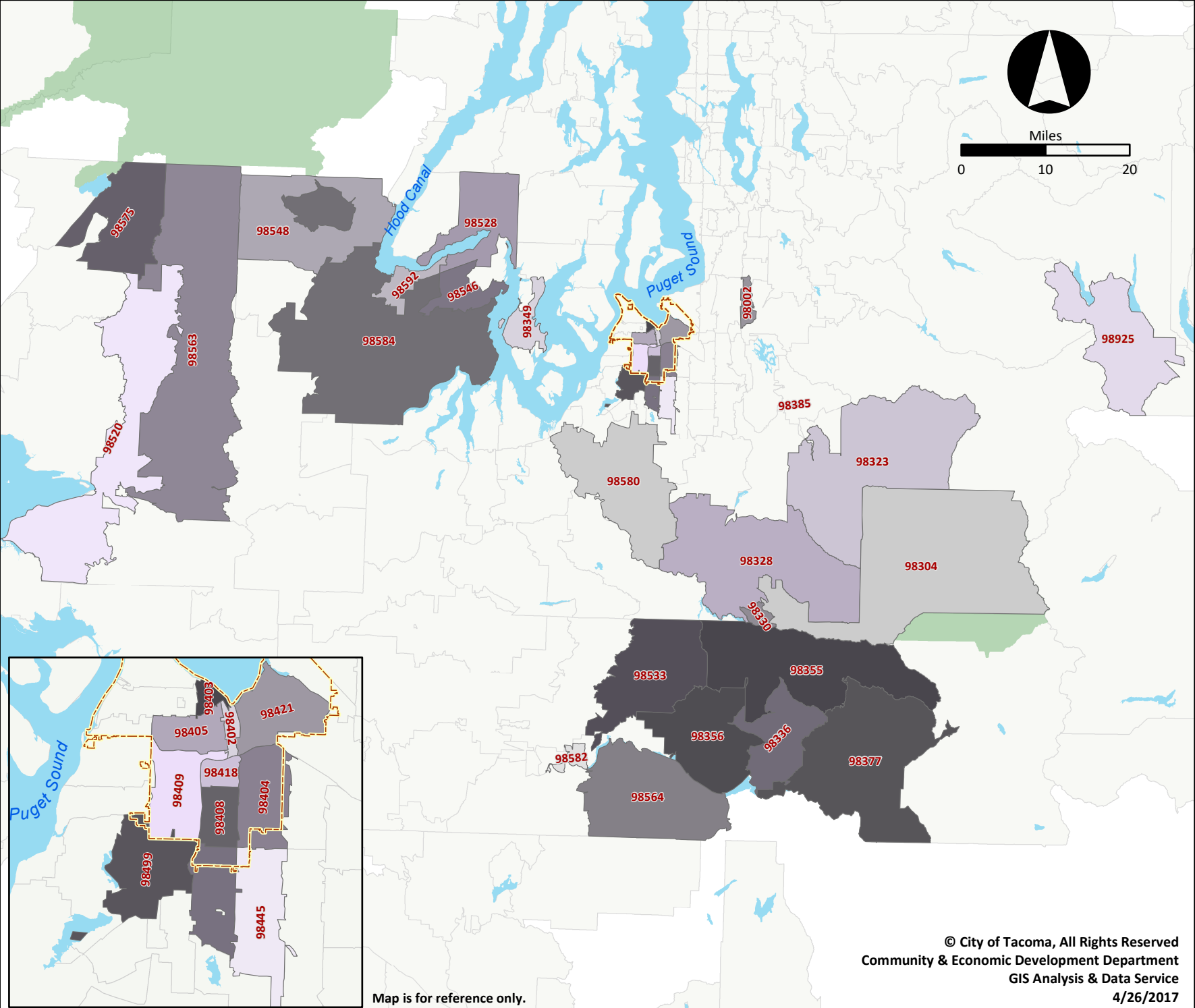
No PO Boxes

Contractor Representative:_____

Date:_____

Title:_____

Appendix C: Economically Distressed ZIP Codes Map



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 VII
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 XXXXX County.

The effective date for prevailing wages on this project will be the **January 31, 2023** 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.

PART VIII
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



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

operations using Insurance Services Office (ISO) form CG 20 10 04 13 and CG 20 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.



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

- 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.
- 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:

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



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

4.3 Commercial (Business) Automobile Liability Insurance

Contractor shall maintain Commercial Automobile Liability policy with limits not less than One Million Dollars (\$1,000,000) each accident for bodily injury and property damage and bodily injury and property damage coverage for owned (if any), non-owned, hired, or leased vehicles. Commercial Automobile Liability Insurance shall be written using ISO form CA 00 01 or equivalent. Contractor must also maintain an MCS 90 endorsement or equivalent and a CA 99 48 endorsement or equivalent if "Pollutants" are to be transported.

4.4 Workers' Compensation

4.4.1 Contractor shall comply with Workers' Compensation coverage as required by the 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.

4.5 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.

4.6 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.

4.7 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.

4.8 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.