

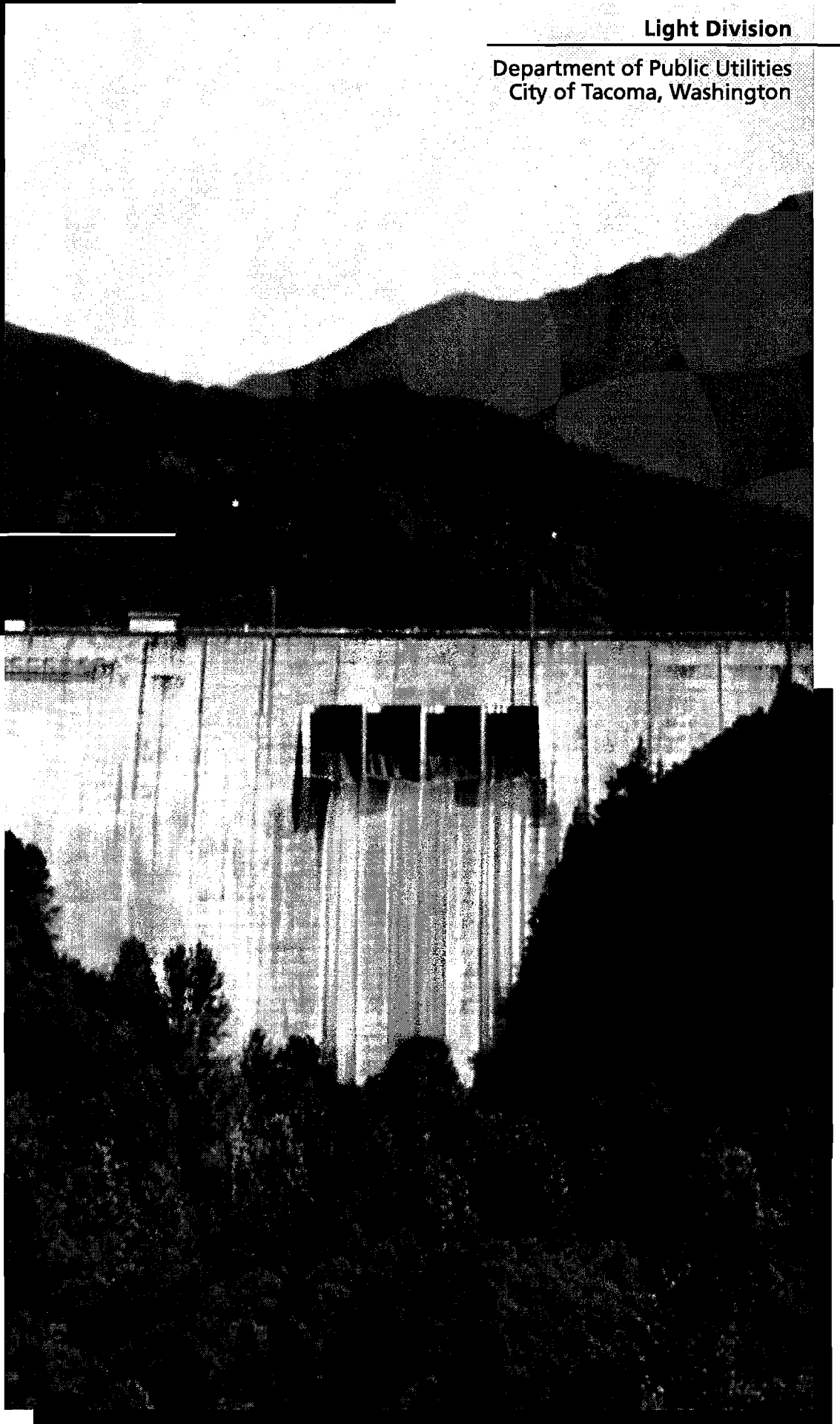
Light Division

Department of Public Utilities
City of Tacoma, Washington

SPECIFICATION

PG20-0156F

Administrative
Building North Fan
Wall



CITY OF TACOMA

SPECIFICATIONS

FOR

NO. PG20-0156F

TACOMA POWER

**ADMINISTRATIVE BUILDING NORTH
FAN WALL**

CITY OF TACOMA
DEPARTMENT OF PUBLIC UTILITIES
TACOMA POWER

Jackie Flowers, Director of Utilities/CEO

Chris Robinson, Power Superintendent/COO

Date: Tuesday, January 12, 2021

Each bid to be enclosed in a sealed envelope bearing the superscription

"Tacoma Power – Administrative Building North Fan Wall"



**City of Tacoma
Generation/Plant Engineering**

**REQUEST FOR BIDS
PG20-0156F ABN Fan Wall**

Submittal Deadline: 11:00 a.m., Pacific Time, Tuesday, February 2, 2021

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

Until further notice, public Bid Opening meetings have been cancelled.

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 by accessing the City of Tacoma Purchasing website at www.TacomaPurchasing.org.

- [Register for the Bid Holders List](#) to receive notices of addenda, questions and answers and related updates.
- Click here to see a [list of vendors registered for this solicitation](#).

Pre-Proposal Meeting: A pre-proposal meeting will be held virtually through GoTo Meeting on Tuesday, January 21, 2021 at 2:00 p.m.

Project Scope: Upgrading Administrative Building North (ABN) single supply fan with fan-wall. This includes but not limited to removal of filter racks and framework, single supply fan and installing new fan-wall, filter rack, controls, ductwork, and associated materials.

Estimate: \$375,000 - \$425,000

Bid Bonds: The original bid bond shall be sent to the Contracting Agency and postmarked no later than the day of bid opening. **Original bid bonds will be delivered to:**

City of Tacoma Procurement & Payables Division

Tacoma Public Utilities

P.O. Box 11007

Tacoma, WA 98411-0007

Paid Leave and Minimum Wage: Effective February 1, 2016, the City of Tacoma requires all employers to provide paid leave and minimum wages, as set forth in Title 18 of the Tacoma Municipal Code. For more information visit www.cityoftacoma.org/employmentstandards.

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.

Federal 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 Doreen Klaaskate, Senior Buyer by email to dklaaskate@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.

SPECIFICATION CONTENTS

This Specification contains the following:

1. Request for Bids
2. Bidder's Checklist
3. Letters and Calls
4. SPECIAL NOTICE TO BIDDERS
5. Signature Page
6. Certification of Compliance with Wage Payment Statutes
7. State Responsibility and Reciprocal Bid Form
8. Proposal Sheets
9. Contractor's Record of Prior Contracts
10. Substitution Request Form
11. Bid Bond
12. EIC Requirements Form
13. Equity in Contracting (EIC) Code
14. Equity in Contracting (EIC) Program Regulations
15. Equity in Contracting (EIC) Utilization Form
16. Special Notice to Bidder EIC
17. Application for Waiver of EIC Requirements
18. Insurance Certificate Requirements
19. Contractor's Work Hazard Analysis Report
20. Performance Bond
21. Payment Bond
22. Contract
23. Contractor Performance Review
24. General Release
25. General Provisions
26. Prevailing Wages
27. Special Provisions
28. Technical Provisions
29. Plans

BIDDER'S CHECK LIST

The bidder's attention is especially called to the following forms which must be submitted with your bid:

- (a) Schedule of bid price.
The unit/lump sum prices bid must be shown in the space provided.
- (b) Signature page.
To be completed and signed by the bidder.
- (c) Certification of Compliance with Wage Payment Statutes
- (d) ~~Proposal data sheets (required when included in the proposal).~~
- (e) Contractor's Record of Prior Contracts (Section 01010, 1.9) **(required/not required)**.
- (f) List of Equipment **(required/not required)**.
- (g) State Responsibility and Reciprocal Bid Preference Form **(required/not required)**.
- ~~(h) Retainage Options~~
- (i) Bid bond or certified check (for construction contracts only).

Each bid must be accompanied by a certified or cashier's check for 5-percent of the total amount bid, or an approved bid bond by a surety company authorized to do business in the State of Washington. See General Provisions 1.03.
- ~~(j) Subcontractor List (applicable only for construction contracts of \$1,000,000 and over).~~
- (k) **CONSTRUCTION CONTRACTS:** Bid proposals for contractor labor must include fully completed "EIC Utilization Form", "Prime Contractors Pre-Work Form", and "Subcontractors Pre-Work Form".

~~**NON-CONSTRUCTION CONTRACTS:** Bid proposals for material and services must include fully completed "Prime Contractor Pre-Work Form".~~
- (l) "Submittals Required with Bid" as are listed in the Special Provisions Section – Submittals and Shop Drawings (for construction contracts) or Submittals Section (for supply contracts) (Section 01300).

The following forms are to be executed after the contract is awarded:

- (a) Contract
This agreement is to be executed by the successful bidder.
- (b) Performance and Payment Bonds **(required/not required)**.

To be executed by the successful bidder and his surety company, and countersigned by a local resident agent of said surety company.
- (c) Contractor's Work Hazard Analysis Report (for construction contracts only)
- (d) General Release to the City of Tacoma (for construction contracts only).

To be executed by the successful bidder upon completion of work and prior to the receipt of the final payment.
- (e) Schedule of Value. For bidder checklist, provide schedule of values listed (Section 01025, 1.3)

LETTERS AND CALLS

All information requested prior to the bid opening is subject to the limitations in Paragraph 1.02 of the **General Provisions**.

Address all letters to the Department of Public Utilities, P. O. Box 11007, Tacoma, Washington 98411.

For questions regarding General Provisions, Special or Technical Provisions, direct attention to Doreen Klaaskate, Senior Buyer, dklaaskate@cityoftacoma.org.

For letters and calls regarding the EIC Program, direct attention to the EIC Program Coordinator at 253-591-5224 for calls, and to EIC/Community & Economic Development, Tacoma Municipal Building, 747 Market Street, Tacoma, Washington 98402, for letters.

For letters and calls regarding the LEAP Program, direct attention to the LEAP Coordinator at 253-594-7933 for calls, and to LEAP/ Community & Economic Development, Tacoma Municipal Building, 747 Market Street, Tacoma, Washington 98402, for letters.

All letters shall indicate the title and specification number (prior to award) or title and contract number (following award).

**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 Small Business Enterprise and Local Employment and Apprenticeship programs;
12. Other qualification criteria set forth in the specification or advertisement that the appropriate department or division head determines to be in the best interests of the City.

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

B. ADDITIONAL SUPPLEMENTAL CRITERIA – NOT APPLICABLE

C. MODIFICATIONS TO SUPPLEMENTAL CRITERIA

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

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

D. DETERMINATION OF BIDDER RESPONSIBILITY

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

SIGNATURE PAGE

DEPARTMENT OF PUBLIC UTILITIES/TACOMA POWER

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

REQUEST FOR BIDS SPECIFICATION NO. PG20-0156F Administrative Building North Fan Wall

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

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.)

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

THIS PAGE MUST BE SIGNED AND RETURNED WITH SUBMITTAL



City of Tacoma

Contractor Name _____ (PG20-0156F)

Certification of Compliance with Wage Payment Statutes

The bidder hereby certifies that, within the three-year period immediately preceding the bid solicitation date (January 13, 2021) 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.*

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 for 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 on 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

 Name of Bidder
PROPOSAL

	<u>QUANTITY</u>	<u>BID UNIT</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>
<u>ITEM 1</u>				
ABN Fan Wall	1	LS	\$ _____	\$ _____
<u>ITEM 2</u>				
*Force Account				\$ <u>60,000</u>
*Bidders shall include the <u>\$60,000</u> figure as part of their overall bid.				
TOTAL ITEMS 1 - 2				\$ _____
**Sales Tax @ <u>10.2%</u>				\$ _____
TOTAL AMOUNT				\$ _____

The City reserves the right to purchase all or parts of any of the line items listed above as an independent purchase.

NOTE TO BIDDERS

- All bidders are invited to attend a virtual pre-bid meeting on January 21, 2021 at 2:00 p.m. via GoTo Meeting.
- Call Jay Madden at 253-502-8366 (desk) or 253-365-5914 (cell) to confirm your attendance.
- If you are unable to attend this meeting, please call the EIC (Equity in Contract) Office at 253-591-5224 and/or the LEAP (Local Employment and Apprenticeship Program), at 253-591-5826, for instructions in filling out the EIC/LEAP forms (if applicable) or for questions concerning these requirements.
- In reference to the COVID-19 state and local requirements, attending contractors shall follow all set rules and regulations at the time of the site visit. Individuals shall provide their own face masks and abide by all social distancing rules.
- If you are able to attend this meeting call Jay Madden at 253-365-5914 to receive an invite through GoTo Meeting Virtual Platform. GoTo Meeting must be downloaded in order to attend the virtual meeting.

CONTRACTOR'S RECORD OF PRIOR CONTRACTS

NAME _____ ADDRESS _____

Beginning Date	Completion Date	Contract With	Contact Person Telephone #	Amount of Contract

REMARKS: _____

TACOMA POWER / GENERATION SUBSTITUTION REQUEST FORM

*****This request shall be submitted to engineer listed below per Specification Submittals and Shop Drawings Section (Construction) or Substitutions Section (Supply).
Substitution requests not received by the engineer will not be considered.*****

TO: Tacoma Power/Generation ATTN: Jay Madden Date: _____
3628 South 35th Street
Tacoma WA 98409
Fax: 253-502-8136

PROJECT: PG20-0156F Administrative Building North Fan Wall Transmittal No. _____
(Specification/Name/Contract No., if applicable)

We hereby submit for consideration, the following product instead of the specified item for the above project:

Specification Section: _____
Specified Item: _____
Proposed Substitution: _____

NOTES: Attach complete technical data, including laboratory tests and samples as applicable.

Provide a detailed comparison of the significant qualities (size, weight, durability, performance and similar characteristics, and including visual effect, where applicable) for the proposed substitution in comparison with the original requirements.

List completely, installation changes and changes to drawings and specifications required by the proposal.

FILL IN BLANKS BELOW:

- A. Does substitution require change in drawing dimensions? ☐ Yes ☐ No
If yes, provide detail: _____
- B. Will undersigned pay for resulting building design changes including engineering/detailing costs? ☐ Yes ☐ No
- C. What effect does substitution have on other trades?

- D. Difference between proposed substitution and specified item?

- E. Manufacturer's guarantees of proposed and specified items are? ☐ Same ☐ Different*
*Explain differences on attachment(s). _____
- F. Are maintenance/service parts locally (within 50 miles) available for proposed substitution? ☐ Yes ☐ No
- G. Will the proposed substitution have any effect on compliance with applicable codes? ☐ Yes ☐ No
If yes, explain: _____
- H. Name and address and current phone number the Project Lead for three (3) similar projects where the proposed product was used, along with the Project name and date of installation:
1. _____
2. _____
3. _____
- I. Contract completion date is? _____ ☐ Same ☐ Different*
*Explain differences on attachment(s). _____

TACOMA POWER / GENERATION SUBSTITUTION REQUEST FORM

*****This request shall be submitted to engineer listed below per Specification Submittals and Shop Drawings Section (Construction) or Substitutions Section (Supply).
Substitution requests not received by the engineer will not be considered.*****

Undersigned attests function and quality equivalent or superior to specified item and waives their rights to additional payment and time which may subsequently be necessitated by failure of the substitution to perform adequately, and for the required work to make corrections thereof.

SUBMITTED BY:

Name

Firm

Address

City, State, Zip

Phone No.

Signature

Date

FOR USE BY TACOMA POWER:

☐ Accepted

☐ Accepted as Noted

☐ Not Accepted

☐ Received Too Late

By: _____

(Project Lead/Manager)

Signature: _____

Date: _____

REMARKS:

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 \$ _____

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 insure that the EIC-eligible subcontractor(s) listed on the EIC Utilization Form are currently certified by the City of Tacoma or the State of Washington's Office of Minority and Women Business Enterprises 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. Please refer to the City of Tacoma EIC Provisions included elsewhere in these Special Provisions.

Equity in Contracting Requirements

Minority Business
Enterprise Requirement

6%

Women Business
Enterprise Requirement

0%

Small Business Enterprise
Requirement

8%

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

www.cityoftacoma.org/sbe
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: PG20-0156F
Date of Record: 10.7.2020

*For the OMWBE list, be sure to only look for businesses in Pierce, King, Lewis, Mason, and Grays Harbor counties.

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 Certification.
- 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.

- 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."
- C. "City" means all Departments, Divisions and agencies of the City of Tacoma.
- D. "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.
- E. "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.

F. “Goals” means the annual level of participation by MWBEs and SBEs 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.

G. “MWBE Certified business” (or “MWBEs”) means a business that meets the criteria set forth in Section 1.07.050 of this chapter and has been certified as meeting that criteria by the Community and Economic Development Department Program Manager.

H. “SBE Certified Business” (or “SBEs”) means a business that meets the criteria set forth in Section 1.07.050 of this chapter and has been certified as meeting that criteria by the Community and Economic Development Department-SBE Program Manager.

I. “SBE Program Manager” means the individual appointed, from time to time, by the City’s Community and Economic Development Director to administer the Program Regulations.

J. “Program Regulations” shall mean the written regulations and procedures adopted pursuant to this chapter for procurement of Supplies, Services and Public Works.

K. “Non-Public Works and Improvements” means all competitively solicited procurement of Supplies and/or Services by the City not solicited as Public Works.

L. “Person” means individuals, companies, corporations, partnerships, associations, cooperatives, any other legally recognized business entity, legal representative, trustee, or receivers.

M. “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.

N. “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.

O. “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.

P. “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.

Q. “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.

R. “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.

S. “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.

T. “Tacoma Public Utilities Service Area” means any ZIP code in which Tacoma Public Utilities maintains infrastructure or provides retail services.

(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 rules and 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 MWBE and SBE goals set forth herein. The Program Regulations shall become effective following public notice and an opportunity to comment by the public.

C. The Program Regulations adopted pursuant to this section are for the administrative and procedural guidance of the officers and employees of the City and are further expressions of the public policy of the City. The Program Regulations, when adopted, shall not confer an independent cause of action or claim for relief cognizable in the courts of the state of Washington or the United States of America to any third parties, and such provisions shall not be used as the basis for a lawsuit in any court of competent jurisdiction challenging the award of any contract by the City.

(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 Certification.

A. The Program Manager shall approve a business as a Certified Business if all of the following criteria are satisfied:

1. The business is certified as a SBE, MBE, WBE, or MWBE through the state of Washington's Office of Minority & Women Business Enterprises; and
2. The company 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 company'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 company'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.

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 certification 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. 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 MWBEs and SBEs in the provision of supplies, services, and public works procured by the City. Cumulative annual goals for the participation of MWBEs and SBEs in City contracts shall be based on the number of qualified MWBEs and SBEs operating within the Tacoma Public Utilities Service Area. The dollar value of all contracts awarded by the City to MWBEs and SBEs 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. Waivers. City departments/divisions or the Program Manager may request to waive one or more of the requirements of this chapter as they apply to a particular contract or contracts. Waivers 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 and waiver must be documented by the department/division awarding the contract.

2. Not Practicable: Compliance with the requirements of this chapter would impose an unwarranted economic burden or risk to the City after consideration of existing budgetary approvals.

3. Sole source: The supplies, services, and/or public works are available from only one source, and subcontracting possibilities do not reasonably exist as determined by the finance purchasing manager.

4. Government purchasing. The City is a party to or included in a federal, state or inter-local government purchasing agreement as approved by the finance purchasing manager.

5. Lack of certified contractors: An insufficient number of qualified contractors exist to create utilization opportunities.

6. Best interests of the City: Waiver of goals is in the best interests of the City due to unforeseen circumstances, provided that said circumstances are set forth in writing by the requestor.

C. Review of Waivers. A waiver determination by the finance purchasing manager may be reviewed by the Board of Contracts and Awards (C&A Board). The C&A Board may also review a request to reduce or waive the utilization requirements based on Not Practicable or Best Interests of the City circumstances. The C&A Board shall determine whether compliance with such requirements 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. If the determination of the C&A Board does not resolve the matter, a final determination shall be made by the City Council or Public Utility Board, as the case may be.

(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 MWBE and SBE requirements established for that contract in accordance with this chapter and the Program Regulations.

B. The determination of MWBE and SBE usage and the calculation of MWBE or SBE requirements per this section shall include the following considerations:

1. General. The dollar value of the contract awarded by the City to a MWBE or SBE 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 MWBE and/or SBE requirement(s) for expenditures for supplies obtained from an MWBE or SBE; provided such MWBE or SBE assumes the actual and contractual responsibility for delivering the supplies with its resources. The contractor may also receive credit toward attainment of the MWBE or SBE goal for the amount of the commission paid to a MWBE or SBE resulting from a supplies contract with the City; provided the MWBE or SBE performs a commercially useful function in the process.

3. Services and Public Works subcontracts. Any bid by a certified MWBE and/or SBE or a bidder that utilizes a certified MWBE and/or SBE shall receive credit toward requirement attainment based on the percentage of MWBE and/or SBE usage demonstrated in the bid. A contractor that utilizes an MWBE and/or SBE 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. MWBEs and/or SBEs 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. An MWBE and/or SBE firm 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 MWBE and/or SBE requirements shall be considered a non-responsible bidder unless the bidder receives a waiver from the Program Manager or C&A Board.

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. 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 MWBE or SBE 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 MWBE or SBEs projected to be used must be approved in advance by the Program Manager. Substitution of one MWBE or SBE with another shall be allowed where there has been a refusal to execute necessary agreements by the original MWBE or SBE, 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 MWBE or SBE is available as a substitute and that failure to secure participation by the MWBE or SBE identified in the solicitation is not the fault of the respondent, substitution with a non-MWBE or non-SBE 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 MWBEs or SBEs, 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 MWBEs or SBEs, and shall include the right of the City to inspect such records.

(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 MWBE and SBE utilization

levels, waivers, proposed modifications to the program, and such other matters as may be specified 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)

1.07.100 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)

City of Tacoma

Equity In Contracting Program Regulations

City of Tacoma Equity In Contracting Regulations Manual

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Introduction

This document serves as the administrative manual for the Equity in Contracting policy that is described in Tacoma Municipal Code (TMC) Chapter 1.07.040(B). The manual will explain how compliance, monitoring, oversight, requirement-making, bid incentives, and enforcement actions will be administered. The document will be regularly updated. For any questions related to this document, please contact the Equity in Contracting (EIC) office at (253)591-5075 or SBEOffice@cityoftacoma.org.

Goals/Requirements on Contracts

A. Requirements

1. Public Work

- a. Minority Business Enterprise (MBE), Women Business Enterprise (WBE), and Small Business Enterprise (SBE) requirements are placed on all Public Work projects.
- i. MBE, WBE, and SBE requirements are **mandatory**. As such, any bidder that does not meet any requirement shall be considered non-responsive by the Equity in Contracting office.
- ii. If a bidder wishes to request a waiver, they must identify the request on the Equity in Contracting Waiver Request Form complete with the reason(s) why.
 1. Waiver types are listed under the “Waivers” section B.

Contractors are also subject to the City’s ordinances and regulations pertaining to having an affirmative action program and prohibiting discrimination. If needed, please contact the Equity in Contracting Office at 253-591-5075 for assistance. The list of City of Tacoma SBE subcontractors is available at

<https://cityoftacoma.org/cms/One.aspx?portalId=169&pageId=112505>. The list of MBE, WBE, and SBE certified firms from the Washington State Office of Minority and Women Owned Business Enterprises (OMWBE) can be found at: <https://omwbe.diversitycompliance.com/>

All SBE goals may be met by using DBE’s or SBE’s from the OMWBE list or the City of Tacoma SBE list. Please contact the Equity in Contracting Office for questions or to verify a firms status.

Contract Compliance

A. Benefits

The City of Tacoma must monitor compliance for all contracts that have requirements related to Equity in Contracting policies. Adequate monitoring allows the City to audit ongoing contracts for compliance, make necessary changes to the Equity in Contracting Regulations Manual based on real data, and to pro-actively monitor any possible discrimination on City of Tacoma-funded contracts.

B. Requirements

1. All contracts that have requirements related to the Equity in Contracting policy must utilize two cloud-based software solutions:
 - a. “B2GNow” for prime-contractor and sub-contractor payment compliance.
 - b. “LCP Tracker” for certified payroll compliance.
2. To access both systems, please use the following link:
<https://cityoftacoma.sbecompliance.com/?TN=cityoftacoma>

3. For support using these software solutions, please contact the Equity in Contracting office at (253)591-5075.

C. Key Performance Indicators

1. B2GNow
 - a. Ethnicity and Gender Summary
 - i. Subcontractors Only
 - ii. With Primes
 - b. Prompt Payment Analysis
 - c. Prime Contractor Performance on Active Contracts
 - d. Contract Awards Summarized by Department
2. LCP Tracker
 - a. Apprentice Hours
 - i. By Trade
 - ii. By Contractor
 - b. Employment By Area
 - i. Zip Code
 - ii. Council Districts
 - c. Employment By Ethnicity

Waivers

A. Benefits

There are times where the City may desire to waive a requirement from a contract. The following waivers, also identified in the Purchasing Policy Manual, give the City flexibility to waive requirements when the situation makes sense for it.

B. Requirements

1. Emergency
 - a. Must be documented and requested by the department/division awarding the contract.
2. Not Practicable
 - a. Must be documented and requested by the department/division awarding the contract.
3. Sole Source
 - a. Must be confirmed by the Finance Purchasing Manager.
 - b. Preliminary check to be made by Equity in Contracting division explicitly for potential MBEs, WBEs, and SBEs.
4. Government Purchasing
 - a. Must be confirmed by the Finance Purchasing Manager.
5. Lack of Certified Contractors
 - a. Must be documented and confirmed by the Equity in Contracting division.
 - b. The division will look up the available contractors by scope of work from the OMWBE roster and/or WEBS.
 - c. The list produced by this research shall be documented with other files for the contract in question.
 - d. If there are not more than 3 available contractors, there will not be a requirement placed on the contract for that scope of work.
6. Best Interests of the City
 - a. Must be documented and requested by the department/division awarding the contract.

C. Compliance

1. Waiver requests may be initiated by the contractor or the department owner.
 - a. When initiated by the contractor, the “Application for EIC Requirement Waiver” must be submitted to the EIC office.
 - i. The application will be reviewed by the office, and a determination will be made.
 - b. When initiated by the department owner, a request must be made in writing to the EIC office.
2. The waivers will be reviewed in accordance with 1.07.060(C).

D. Key Performance Indicators

1. Total quantity of Waivers
 - a. By type number
 - b. Type 5 will also need to document the NAICS code referenced.

Version History

The version history is marked by day.month.year.version nomenclature. A higher version number denotes a more recent version. For example, a 1.1.2020.1 version would denote the first version made in January 1st of 2020. A 1.1.2020.3 version would denote the third version made on January 1st of 2020. When referencing a specific contract, be sure to note that the version of the administrative manual matches that which was in the bid specifications.

Current Version

3.11.2020.1

Previous Version(s)

2.21.2020.1



City of Tacoma
Community & Economic Development
Office of Equity in Contracting
747 Market Street, Rm 900
Tacoma WA 98402
253-591-5075

EQUITY IN CONTRACTING UTILIZATION FORM

This form is to document **only** the EIC contractors or material suppliers that will be awarded a contract. This information will be used in calculating the **EVALUATED BID**. Additional forms may be used if needed.

- Prime contractors are encouraged to solicit bids from EIC approved firms.
- Be sure to include this form with your bid submittal in order to receive EIC credit.
- It is the prime contractor's responsibility to check the certification status of EIC contractors prior to the submittal deadline.

Bidder's Name: _____

Address: _____ City/State/Zip: _____

Spec. No. _____ Base Bid * \$ _____ **Complete company names and phone numbers are required to verify your EIC usage.**

a. Company Name and Telephone Number	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 EIC firms 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 deductive selected by the City. Also, please refer to Items #10-12 below.
2. Column "a" – List all EIC companies that you will be awarding a contract to if you are the successful bidder.
3. Column "b" – Identify if this firm is being utilized as an MBE, WBE, or SBE. (Firms may count towards multiple requirements)
4. Column "c" – List the appropriate NAICS code for the scope of work, services, or materials/supplies for each contractor.
5. Column "d" – The bid amount must be indicated for **all** listed **EIC** that you plan on doing business with. This quote is the price that you and the contractor have negotiated prior to bid opening.
6. Column "e" – The bid amount must be indicated for **all** listed **EIC** that you plan on doing business with. This quote is the price that you and the material supplier have negotiated prior to bid opening.
8. 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.
9. 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.
10. 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.
11. Block "i" – The percent 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 = EIC usage as a percent of the Base Bid.)
12. Block "j" – The percent 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 = EIC usage as a percent of the Base Bid.)

13. Block "k" – The percent 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 = EIC usage as a percent of the Base Bid.)

It is the prime contractor's responsibility to check the status of EIC contractors prior to bid opening. Call the EIC Office at 253- 591-5075 for additional information.

CITY OF TACOMA
FINANCE/PURCHASING DIVISION

SPECIAL NOTICE TO BIDDERS

Equity in Contracting – EIC

Equity in Contracting (EIC) forms and attachments must be fully and accurately completed and returned at the time of Bids. Failure to do so may result in the proposal being considered nonresponsive. These forms will be used to determine if the firm complies with Tacoma Municipal Code Chapter 1.07 and State Law.

Vendors for public works and improvement-type projects are required to be inclusive of Minority Owned Business Enterprises, Women-Owned Business Enterprises, and Small Business Enterprises. The criteria for determining whether inclusion has been made are set forth in the City's EIC regulations. Vendors are also subject to the City's EIC ordinance and regulations pertaining to having an Equal Employment Opportunity policy prohibiting discrimination. Bids will be evaluated on an individual basis to determine compliance with this section. The EIC Utilization Form, when required, should accompany your submittal. Contact the EIC Office at (253) 591-5075 if there are questions about this requirement.

Either the firm submitting the bid or the firms they plan to subcontract with, if qualified, may meet the percent requirements listed on the EIC Requirement Form.

Bidders unable to meet the percent requirements shall submit an Application of Waiver of EIC Requirements, the Equity in Contracting Utilization Form, and any required attachments with the Bid in accordance with the Equity in Contracting Regulations.

FAILURE TO COMPLETE AND SUBMIT EIC FORMS WITH THE BID SUBMITTAL PACKAGE WILL RESULT IN THE BID BEING DECLARED NON-RESPONSIVE AND REJECTED.

It is the bidder's responsibility to insure that their firm (if EIC-eligible) and/or eligible subcontractor(s) listed on the EIC Utilization Form are currently certified by the City of Tacoma or the State of Washington's Office of Minority and Women Business Enterprises 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.

All SBE goals may be met by using DBEs or SBEs from the OMWBE list or the City of Tacoma SBE list.

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

www.cityoftacoma.org/sbe

www.omwbe.diversitycompliance.com – From this list, be sure check for certified MBE, WBE, MWBE, and SBE companies located in Pierce, King, Lewis, Mason, and Grays Harbor counties.

*After December 31, 2020, the list of EIC eligible firms may only be accessed at www.omwbe.diversitycompliance.com

Application for Waiver of EIC Requirements

Section 1: Basic Information			
Contractor's Name:		EIC Requirements	
Street Address:		MBE %	WBE %
City, State, ZIP Code:			
Contact E-mail Address:		SBE %	
Contact Telephone No.:			
Section 2: Type of EIC Waiver Requested			
MBE Waiver: <input type="checkbox"/> Total	<input type="checkbox"/> Partial	If partial waiver, please enter the revised MBE percentage:	
WBE Waiver: <input type="checkbox"/> Total	<input type="checkbox"/> Partial	If partial waiver, please enter the revised WBE percentage:	
SBE Waiver: <input type="checkbox"/> Total	<input type="checkbox"/> Partial	If partial waiver, please enter the revised SBE percentage:	
Please explain the reason for the waiver request:			
Section 3: Supporting Documentation			
Provide the following documentation as evidence of your efforts to meet the EIC requirements set forth in the contract and in support of your waiver application:			
<input type="checkbox"/> Attachment A. List of the general circulation, trade and MWBE/SBE-oriented publications and dates of publications soliciting for certified MWBE/SBE participation as a subcontractor/supplier and copies of such solicitation.			
<input type="checkbox"/> Attachment B. List of the certified MWBEs/SBEs appearing in the State of Washington Office of Minority and Women Business Enterprise (OMWBE) directory that were solicited for this contract. Provide proof of dates or copies of the solicitations and copies of the responses made by the certified MWBEs/SBEs. Describe the specific reasons that responding certified MWBEs/SBEs were not selected.			
<input type="checkbox"/> Attachment C. Descriptions of the contract documents/plans/specifications made available to certified MWBEs/SBEs by the contractor when soliciting their participation and steps taken to structure the scope of work for the purpose of subcontracting with or obtaining supplies from certified MWBEs.			
<input type="checkbox"/> Attachment D. Description of the negotiations between the contractor and certified MWBEs/SBEs for the purposes of complying with the EIC requirements of this contract.			
<input type="checkbox"/> Attachment E. Identify dates of any pre-bid, pre-award or other meetings attended by the contractor, if any, scheduled by the City of Tacoma with certified MWBEs/SBEs whom the City of Tacoma determined were capable of fulfilling the EIC requirements set in the contract.			
<input type="checkbox"/> Attachment F. Other information deemed relevant to the request.			
Section 4: Signature and Contract Information			
By signing and submitting this form, the contractor or department certifies that a good faith effort has been made to promote MWBE/SBE participation pursuant to the EIC requirements set forth under the contract. Failure to submit complete and accurate information may result in a finding of noncompliance, non-responsibility, non-responsiveness, and a suspension or termination of the contract.			
Prepared by (signature): _____		Date: _____	
Name and title of preparer (print): _____			

Instructions for Completing and Submitting an Application for a Waiver of EIC Requirements

Section 1.07 of the Tacoma Municipal Code requires the City to set requirements for participation by Minority and Women-owned Business Enterprises (MWBE) and/or Small Business Enterprise (SBE) on many types of contracts. Prior to the contract award, separate goals are established for MBE, WBE, and SBE utilization, expressed as a percentage of payments made under the contract. The regulations allow the City to impose penalties if contractors fail to meet the requirements established for the contract and also allow the City to grant waivers of requirements, either prior to a contract award or after the award has been made, provided the contractor demonstrates an inability to solicit participation despite good faith efforts to that end. In order for a waiver to be granted, the contractor must submit a completed "Application for Waiver of EIC Requirements" form, along with the required supporting documentation.

Section 1: Basic Information

Enter the contractor's name, address, federal identification number, and the contract number in the spaces provided. Enter the MBE, WBE, and SBE utilization goals set forth in the solicitation or assigned contract.

Section 2: Type of Waiver Request

Check the type(s) of waiver requested. You may request a total or partial waiver of the EIC requirements. If you request a partial waiver any requirement, enter the revised goal for participation in the box provided. Use the space provided to provide a rationale for your waiver request. Consult the EIC Regulations Manual for the acceptable reasons waivers may be provided. You may attach additional sheets, if necessary.

Section 3: Supporting Documentation

Extensive documentation is required to demonstrate good faith efforts to comply with the EIC requirements. See the form for details on the required documentation.

Section 4: Signature and Contact Information

The waiver application must be signed by someone authorized to discuss the waiver with the Equity in Contracting office and Procurement. By signing the waiver application, the contractor certifies that a good faith effort has been made to promote MWBE/SBE participation pursuant to the EIC requirements set forth under the contract. Failure to submit complete and accurate information may result in a finding of non-compliance, non-responsibility, non-responsiveness, and a suspension or termination of the contract.

Note: Unless total waivers for all three of the MBE, WBE, and SBE participation have been granted, the contractor is required to submit all reports and documents – including compliance reports – pursuant to the provisions set forth in the contract, to evidence compliance with the requirements.



CITY OF TACOMA INSURANCE REQUIREMENTS FOR CONTRACTS

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

1. GENERAL REQUIREMENTS

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

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



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

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

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



CITY OF TACOMA INSURANCE REQUIREMENTS FOR CONTRACTS

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

2. CONTRACTOR

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

3. SUBCONTRACTORS

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

4. REQUIRED INSURANCE AND LIMITS

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

4.1 Commercial General Liability Insurance

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

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

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

4.2 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



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

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.

4.3 Workers' Compensation

4.3.2 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.

4.4 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.

4.5 Excess or Umbrella Liability Insurance

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

4.6 Commercial Property Insurance

Contractor shall provide Commercial Property Insurance for loss or damage to any and all equipment owned by City of Tacoma while in the care, custody, or control of Contractor, Subcontractors, or their agents. The coverage shall be provided on an ISO **Special Form Causes of Loss** CP10 30 06 07 or equivalent and shall provide full replacement cost coverage. The deductible shall not exceed Two Thousand Five Hundred Dollars (\$2,500). Contractor shall be responsible for paying the deductible for the applicable coverage.

4.7 Installation Floater Insurance

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

4.8 Builder's Risk Insurance

Contractor shall maintain during the term of the Contract and until final acceptance of the work by the City of Tacoma, a policy of Builder's Risk Insurance providing coverage for all-risk of physical injury to all structures to be constructed according to the Contract. City of Tacoma shall be included as a named insured (not named as additional insured) on the policy. Builder's Risk Insurance policy shall:

4.8.2 Have a deductible of no more than Five Thousand Dollars (\$5,000) for each occurrence, the payment of which will be the responsibility of Contractor. Any increased deductibles accepted by City of Tacoma will remain the responsibility of Contractor.

4.8.3 Be on an ISO Special Form Causes of Loss or equivalent and shall insure against the perils flood, earthquake, theft, vandalism, malicious mischief, and collapse.

4.8.4 Include coverage for temporary buildings, debris removal, and damage to



CITY OF TACOMA

INSURANCE REQUIREMENTS FOR CONTRACTS

- materials in transit or stored off-site.
- 4.8.5 Be written in the amount of the completed value of the structures, with no coinsurance provisions exposure on the part of Contractor or City of Tacoma.
- 4.8.6 Contain a Waiver of Subrogation provision whereby each insured waives their subrogation rights to the extent the loss is covered by this insurance.
- 4.8.7 Grant permission to occupy, allowing the building or structure to be partially occupied prior to completion, without detrimental effect to the coverage provided.
- 4.8.8 Include coverage for the testing and startup of the building's operating systems.
- 4.8.9 Include coverage for City of Tacoma's loss of use or business interruption arising out of a covered loss which delays completion.
- 4.8.10 Include resultant damage coverage for loss due to faulty workmanship and defective material.

Contractor and City of Tacoma waive all rights against each other, their respective subcontractors, agents, and representatives for damages caused by fire or other perils to the extent covered by Builder's Risk Insurance or other property insurance applicable to the work. The policies shall provide such waivers by endorsement or otherwise.

4.9 Other Insurance

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

TACOMA PUBLIC UTILITIES CONTRACTOR'S WORK HAZARD ANALYSIS REPORT

for

(Project Name)

The contractor and his/her subcontractors shall thoroughly review the scope of work described in the proposed project drawings and specifications. Following the review, the contractor will be responsible to indicate below any known or potential safety issues or phases of construction that may require specific safety procedures as identified by WISHA or OSHA regulations, and/or prudent construction practices; i.e., shoring, fall protection, scaffolding, hazardous materials, etc.

Failure to list and comply with safety requirements will be cause for disqualification from future Utilities contracts. A copy of this report shall be posted at the job site at all times.

If, during the course of construction, other safety requirements are identified, they will be added to this report as an addendum. The contractor will be required to adhere to the recommended actions and/or controls identified in the addendum.

SAFETY ISSUES/CONCERNS*	HAZARDS	RECOMMENDED ACTION AND/OR CONTROLS
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

*USE A SEPARATE SHEET IF MORE ROOM IS NEEDED

Contractor Name and Title

Date

Job Site Superintendent

Date

Company Officer Signature



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: _____



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: _____

CONTRACT

Resolution No.
Contract No.

This Contract is made and entered into effective this _____ day of ,20____, ("Effective Date") by and between the City of Tacoma, a Municipal Corporation of the State of Washington ("City"), and legal name of Supplier including type of business entity ("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. Enter Spec Number and Enter Spec Title together with all authorized addenda.
2. Contractor's submittal (or specifically described portions thereof) dated Enter Submittal Date submitted in response to Specification No. Enter Spec Number and Enter Spec Title.
3. Describe with specific detail and list separately any other documents that will make up the contract (fee schedule, work schedule, authorized personnel, etc.) or any other additional items mutually intended to be binding upon the parties.

Delete this highlighted sentence, paragraph II and sub-bullets #1 and #2 if there are no additional attachments to the contract (attachments would be things other than a specific, contract, or bonds).

- II. In the event of a conflict or inconsistency between the terms and conditions contained in this document entitled Contract and any terms and conditions contained the above referenced Contract Documents the following order of precedence applies with the first listed item being the most controlling and the last listed item the least controlling:

1. Contract
2. List remaining Contract Documents in applicable controlling order.

- III. The Contract terminates on xxxxx. {May remove if not applicable}

- IV. The total price to be paid by City for Contracts full and complete performance hereunder may not exceed:
\$ _____, 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 these insurance requirements shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

- VIII. Contractor acknowledges, and by signing this Contract agrees, that the Indemnification provisions set forth in the controlling Contract Documents, including the Industrial Insurance immunity waiver (if applicable), are totally and fully part of this Contract and, within the context of the competitive bidding laws, have been mutually negotiated by the Parties hereto.

- IX. Contractor and for its heirs, executors, administrators, successors, and assigns, does hereby agree to the full performance of all the requirements contained herein and in Contract Documents.
- X. 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, as of the Effective Date stated above, which shall be Effective Date for bonding purposes as applicable.

CITY OF TACOMA:

CONTRACTOR:

By:

By:

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

Director of Finance: _____

City Attorney (approved as to form): _____

Approved By: _____

Approved By: _____

Approved By: _____

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Approved By: _____

Approved By: _____

Approved By: _____

**TACOMA POWER, GENERATION SECTION
CONTRACTOR PERFORMANCE REVIEW
(FOR INTERNAL RECOMMENDATION PURPOSES)**

Project:		Spec. #
Location:	Contractor: (Use separate sheet for each sub-contractor)	
Engineer:	Inspector:	

EVALUATION

Rate Each Area:	EXCELLENT - 3	GOOD - 2	ACCEPTABLE - 1	INADEQUATE - 0
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- | | |
|---|--|
| _____1. Safety | _____7. Quality of Supervisor |
| _____2. Quality of Work | _____8. Site Management |
| _____3. Overall Rating | _____9. Adequate Equipment |
| _____4. Communication/Coordination
on Site | _____10. Adequate Personnel |
| _____5. Communication/Coordination
with Office | _____11. Was Project Completed
on Time (Y/N) |
| _____6. Supervision on Site | _____12. Would You Recommend
this Contractor Work
for Us Again (Y/N) |

[illegible]

Input by _____ Review No. _____ Date _____

GENERAL PROVISIONS

(Revised December 15, 2020)

SECTION I - BIDDING REQUIREMENTS

SECTION I REQUIREMENTS ARE BINDING ON ALL RESPONDENTS.

1.01 USE AND COMPLETION OF CITY PROPOSAL SHEETS

A. Respondent's Proposal

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

B. Alterations of Proposals Not Allowed

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

C. Filling Out City Proposal Sheets

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

1.02 CLARIFICATION OF PROPOSAL FOR RESPONDENT

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

1.03 RESPONDENT'S BOND OR CERTIFIED CHECK

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

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

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

1.04 DELIVERY OF PROPOSALS TO THE CITY'S PURCHASING OFFICE

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

1.05 LICENSES/PERMITS

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

1.06 CONTRACTOR'S STATE REGISTRATION NUMBER

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

1.07 BID IS NONCOLLUSIVE

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

1.08 EVALUATION OF BID

A. Price, Experience, Delivery Time and Responsibility

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

B. Prequalified Electrical Contractor

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

C. Insertions of Material Conflicting with Specifications

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

D. Correction of Ambiguities and Obvious Errors

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

1.09 WITHDRAWAL OF BID

A. Prior to Bid Opening

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

B. After Bid Opening

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

1.10 OPENING OF BIDS

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

1.11 CITY COUNCIL/PUBLIC UTILITY BOARD FINAL DETERMINATION

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

1.12 RESPONDENT'S REFUSAL TO ENTER INTO CONTRACT

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

1.13 TAXES

A. Include In Proposal All Taxes

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

B. Federal Excise Tax

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

C. City of Tacoma Business and Occupation Tax

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

1.14 FIRM PRICES/ESCALATION

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

1.15 AWARD

A. Construction and/or Labor Contracts

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

B. Supply/Equipment Contracts

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

1.16 INCREASE OR DECREASE IN QUANTITIES

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

1.17 EXTENSION OF CONTRACT

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

1.18 PAYMENT TERMS

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

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

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

1.20 COOPERATIVE PURCHASING

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

1.21 PUBLIC DISCLOSURE: PROPRIETARY OR CONFIDENTIAL INFORMATION

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

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

B. If Respondent provides City with records or information that Respondent considers confidential or proprietary, Respondent must mark all applicable pages or sections of said record(s) as "Confidential" or "Proprietary." Further, in the case of records or information submitted in response to a Request for Proposals, an index must be provided indicating the affected pages or sections and locations of all such material identified Confidential or Proprietary. Information not included in the required index will not be reviewed for confidentiality or as proprietary before release. If Supplier fails to so mark or index Submittals and related records, then the City, upon request, may release said record(s) without the need to satisfy the requirements of subsection A above; and Respondent expressly waives its right to allege any kind of civil action or claim against the City pertaining to the release of said record(s).

1.22 Submission of materials in response to City's Solicitation shall constitute assent by Respondent to the foregoing procedure and Respondent shall have no claim against the City on account of actions taken pursuant to such procedure. FEDERAL AID PROJECTS

The City of Tacoma in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, subtitle A, Office of the Secretary, part 21, nondiscrimination in federally assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises as defined at 49 CFR, part 26, will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

SECTION II - CONTRACT REQUIREMENTS

2.01 CONTRACTOR'S RESPONSIBILITY

A. Contract Documents

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

B. Surety Bonds

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

C. Independent Contractor

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

2.02 CONFLICTS IN SPECIFICATIONS

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

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

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

2.03 INSPECTION

A. Of the Work

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

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

B. Inspector's Authority

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

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

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

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

2.04 FEDERAL, STATE AND MUNICIPAL REGULATIONS

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

2.05 INDEMNIFICATION

A. Indemnification

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

B. Limitation of Liability for Primarily Supply-Type Contracts

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

2.06 CONTRACTOR'S INSURANCE

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

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

2.07 ASSIGNMENT AND SUBLETTING OF CONTRACT

C. Assignment

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

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

D. Subletting

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

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

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

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

2.08 DELAY

E. Extension of Time

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

F. Unavoidable Delay

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

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

2.09 GUARANTEE

A. Guarantee for Construction, Labor or Services Contract

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

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

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

B. Guarantee for Supply Contracts

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

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

C. Guarantee Period Extension

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

2.10 DEDUCTIONS FOR UNCORRECTED WORK

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

2.11 CITY OF TACOMA'S RIGHT TO TERMINATE CONTRACT

A. Termination for Convenience

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

B. Termination for Cause

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

2.12 LIENS

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

2.13 LEGAL DISPUTES

A. General

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

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

B. Attorney Fees

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

2.14 DELIVERY

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

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

Legal holidays of the City of Tacoma are:

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

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

2.15 PACKING SLIPS AND INVOICES

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

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

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

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

2.16 APPROVED EQUALS

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

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

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

2.17 ENTIRE AGREEMENTS

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

2.18 CODE OF ETHICS

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

2.19 FEDERAL FINANCIAL ASSISTANCE

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

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

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

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

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

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

B. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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

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

C. CLEAN AIR ACT

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

D. FEDERAL WATER POLLUTION CONTROL ACT

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

E. DEBARMENT AND SUSPENSION

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

F. BYRD ANTI-LOBBYING AMENDMENT

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

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

Certification for Contracts, Grants, Loans, and Cooperative Agreements

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

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

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

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Date

G. PROCUREMENT OF RECOVERED MATERIALS

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

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

GENERAL PROVISIONS

SECTION III - CONSTRUCTION AND/OR LABOR CONTRACTS

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

3.01 RESPONDENT'S DUTY TO EXAMINE

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

3.02 PERMITS

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

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

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

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

3.04 TRENCH EXCAVATION BID ITEM

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

3.05 SAFETY

A. General

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

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

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

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

B. Work Hazard Analysis Report

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

3.06 PROTECTION OF WORKERS AND PROPERTY

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

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

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

3.07 CONTRACTOR - SUPERVISION AND CHARACTER OF EMPLOYEES

A. Superintendent to Supervise Contractor's Employees

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

B. Character of Contractor's Employees

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

3.08 CONTRACTOR'S COMPLIANCE WITH THE LAW

A. Hours of Labor

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

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

B. Prevailing Wages

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

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

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

3.09 COPELAND ANTI-KICKBACK ACT

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

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

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

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

3.10 CHANGES

A. In Plans or Quantities

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

B. Extra Work

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

C. Extra Work - No Agreed Price

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

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

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

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

D. Claims for Extra Work

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

3.11 CLEANING UP

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

3.12 PROGRESS PAYMENT

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

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

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

3.13 FINAL PAYMENT

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

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

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

3.14 FAILURE TO COMPLETE THE WORK ON TIME

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

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

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

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

3.15 CITY RESERVES RIGHT TO USE FACILITIES PRIOR TO ACCEPTANCE

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

3.16 LIST OF SUBCONTRACTORS

Bid proposals for construction, alteration or repair of any building or other public works that may exceed \$1,000,000 including tax shall satisfy the following requirement: Respondent shall submit as part of the bid, the names of the subcontractors, with whom the respondent, if awarded the contract, will subcontract performance of the work of heating, ventilation and air conditioning, plumbing as described in chapter 18.106 RCW, and electrical as described in chapter 19.28 RCW, or to name itself for the work. The respondent shall not list more than one subcontractor for each category of work identified, unless subcontractors vary with bid alternates, in which case the respondent must indicate which subcontractor will be used for which alternate. Failure to comply with this provision or the naming of two or more subcontractors to perform the same work shall require the City (pursuant to state law RCW 39.30.060) to determine that respondent's bid is nonresponsive; therefore, the bid will be rejected.

GENERAL RELEASE TO THE CITY OF TACOMA

The undersigned, named as the contractor in a certain agreement between (CONTRACTOR) and the City of Tacoma, dated _____ 20____, hereby releases the City of Tacoma, its departmental officers, employees, and agents from any and all claim or claims known or unknown, in any manner whatsoever, arising out of, or in connection with, 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 _____

**NOTE: ORIGINAL RELEASE WILL BE
MAILED TO THE CONTRACTOR
AT THE END OF THIS PROJECT**

PREVAILING WAGE RATES

This project requires prevailing wages under chapter 39.12 RCW. Any worker, laborer, or mechanic employed in the performance of any part of the work shall be paid not less than the applicable prevailing rate of wage.

The project site is located in Pierce County/Counties.

The effective date for prevailing wages on this project will be the **submittal deadline** with these exceptions:

- a. If the project is not awarded within six months of the submittal deadline, the award date is the effective date.
- b. If the project is not awarded pursuant to a competitive solicitation, the date the contract is executed is the effective date.
- c. Janitorial contracts follow WAC 296-127-023.

Except for janitorial contracts, these rates shall apply for the duration of the contract unless otherwise noted in the solicitation.

Look up prevailing rates of pay, benefits, and overtime codes from this link:

<http://www.lni.wa.gov/TradesLicensing/PrevWage/WageRates/default.asp>

REQUIRED DOCUMENTS

The Contractor shall submit to the City the following Department of Labor and Industries (L&I) forms for itself and for each firm covered under [39.12 RCW](#) that provided work and materials for the Contract:

1. A copy of an approved Statement of Intent to Pay Prevailing Wages, L&I form number [F700-029-000](#). The City will make no payment under this Contract for the Work performed until this statement has been approved by L&I and a copy of the approved form has been submitted to the City.
2. A copy of an approved Affidavit of Prevailing Wages Paid, L&I form number [F700-007-000](#). The Contracting Agency will not grant completion or release retainage held under chapter 60.28 RCW until all approved Affidavit of Wages paid for Contractor and all Subcontractors have been received by the City.

SPECIFICATION NO. PG20-0156F

Administrative Building North Fan-wall

These Special and Technical Specifications have been prepared under the direction of a licensed Professional Engineer, registered in the State of Washington

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DIVISION 1 - SPECIAL PROVISIONS

SECTION 01010 - SUMMARY OF WORK

1.1 PROJECT DESCRIPTION

This project includes the construction of upgrading Administration Building North (ABN) single supply fan with a Fan-Wall. This includes, but not limited to, removal of existing filter racks and framework, single supply fan, wall structures, and installing new Fan-Wall, filter racks, controls, duct-work and associated materials.

The contractor shall supply all materials required to complete the work required by this contract in excess of those materials to be supplied by Tacoma Power as listed in Section 01040 – Project Coordination.

In all cases, the City's contract is with one (1) general contractor and it is the general contractor's responsibility to ensure all work required to provide a complete and operational facility is included in their bid. When possible, the City has attempted to reference work which should be coordinated with various trades, but it is the contractor's responsibility to coordinate and schedule the work of all subcontractors, trades, and suppliers to assure the proper and timely prosecution and completion of all items of work.

Major components of work under this contract include, but are not limited to, the following list:

1. Removing of existing filter banks and sheet metal walls.
2. Fabricating new structural support framing and filter banks.
3. Provide new and temporary piping supports and offsets for allowable clearances for new Fan-Wall.
4. Installing new Fan-Wall structure and fans per manufactures recommendation.
5. Provide and install new building controls which include hardware, software and graphics.
6. Pan-off and seal all air openings to provide a pressurized fan room.
7. Provide temporary removable sheet metal walls to allow for commissioning of Fan-Wall before demo of existing fan.
8. After manufacturer commissions Fan-Wall, disassemble existing supply fan. Provide permanent sheet metal walls to enclose fan room.
9. After old fan is removed, fabricate and install sheet metal airflow directional walls around existing building main supply ductwork

A. CONCEPT OF SCHEDULE

With the single supply fan kept in operation, this project will be constructed in multiple phases. Phase 1 is to demolish filter racks and sheet metal walls. Phase 2 is to fabricate and install new fan-wall and support structure. Phase 3 is to commission fan-wall to provide function and operation. Phase 4 is to demolish existing fan-wall and fabricate remaining mechanical room walls to enclose the space.

B. ELECTRICAL SYSTEMS

1. By City: All Line Voltage (120 Volt to 460 Volt). From existing building MCC panel to a new City provided fan-wall fused disconnect.
 - a. To include conduit and wiring between MCC and new fused disconnect.

- b. To include line voltage wire between contractor provided fan-wall control panel and each individual fan within the fan-wall.
- 2. By Contractor: All Low Voltage (0 to 24 Volts). From existing Building Management System (BMS) to contractor provided fan-wall control panel.
 - a. To include conduit and wiring between (BMS) and contractor provided fan-wall.
 - b. To include graphics and control software for (BMS) interface.

1.2 PROJECT LOCATION

This project is located at the Tacoma Public Utilities Administrative Building North; Fifth Floor Mechanical Room; 3628 S 35th St Tacoma, WA 98409. The project is located in City of Tacoma, Pierce County, Washington.

1.3 SITE SHOWING

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

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

A site showing will be conducted at the time and location listed on the proposal page. Due to the nature of this project, the bidder is responsible for examining the site prior to placing a bid. **Due to the COVID-19 virus, multiple site showings will be scheduled. Bidding Contractor shall schedule in advance with Jay Madden at 253-502-8366. Contractors shall abide by social distancing standards and shall provide own protective masks, gloves and clothing as necessary to keep yourself and others safe and healthy. It is the bidder's responsibility to assure that they attend the site showing as scheduled.**

If the contractor cannot make the listed showing, they may be able to coordinate a visit to the site by scheduling. Failure to examine the site may be grounds to reject the bid. Tacoma Power shall make no adjustment to the price or provide any compensation to the contractor for impacts relating to the contractor's failure to consider the potential impacts of not only the site conditions observed, but changes in the observed conditions that could have been foreseen by the contractor.

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

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

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

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

1.4 COMMENCEMENT, PROSECUTION AND COMPLETION

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

The contractor shall be required to complete all work by **November 1, 2022**. If the contractor fails to complete all work by **November 1, 2022**, the City will assess liquidated damages in accordance with Section 3.14 of the General Provisions.

- A. The listed calendar date of completion includes allotted time to negotiate shut down and demolition of existing supply fan during a weekend combined with a holiday, if required, and during a moderate temperature weather window that allows for a supply fan shut down with minimal interruptions to the occupied building.

1.5 SPECIFICATION FORMAT

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

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

1.6 CONTRACT WORK TIMES

Contract work times shall be Monday through Friday, 7:00 a.m. to 4:00 p.m., excluding holidays, described in Section 2.14 of the General Provisions or as otherwise approved by the City.

NOTE: The contractor shall include in their bid to work evenings and weekends and/or holidays during supply fan outages. It will be the contractor's responsibility to minimize supply fan outages.

- A. At the minimum existing supply fan shut down and demo shall start Friday 4:00 p.m. through Monday at 6:00 a.m. New fan-wall to be operational by 7:00 a.m. that Monday.

- B. The contractor shall include in their bid four (4) people to work one (1) City recognized holiday combined with noted supply fan shutdown and demo. If the contractor deems that it is not necessary City has the right to receive a credit.

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

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

1.7 QUALIFICATION OF CONTRACTORS

A. QUALIFIED CONTRACTORS

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

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

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

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

B. QUALIFIED SUPERINTENDENT

The contractor shall employ a competent lead mechanic as referenced in Section 01040 – Project Coordination, Paragraph 1.12 – Superintendent.

1.8 SPECIFICATIONS AND DRAWINGS

The following drawings, attached to these specifications, are made a part of the contract:

Drawings for Construction

Drawing No.

Title

Standard Drawings

M-1	Mechanical Room Fan Modification Mechanical Legend
M-2	Mechanical Room Fan Modification Mechanical General Notes
M-3	Mechanical Room Fan Modification Mechanical Schedule
M-4	Mechanical Room Fan Modification Demolition
M-5	Mechanical Room Fan Modification Enlarged Plan
M-6	Mechanical Room Fan Modification Sections
M-7	Mechanical Room Fan Modification Fan Array Mounting Frame
20.5.S1.0	Mechanical Room Fan Modification Plan & Isometric View
20.5.S1.1	Mechanical Room Fan Modification Plan, Section & Details

Drawings for Reference

<u>Drawing No.</u>	<u>Title</u>
20.5 M1.0	ABN Ground Floor West HVAC_TAB
20.5 M1.1	ABN Ground Floor East HVAC_TAB
20.5 M2.0	ABN Main Floor West HVAC_TAB
20.5 M2.1	ABN Main Floor East HVAC_TAB
20.5 M3.0	ABN Second Floor West HVAC_TAB
20.5 M3.1	ABN Second Floor East HVAC_TAB
20.5 M4.0	ABN Third Floor West HVAC_TAB
20.5 M4.1	ABN Third Floor East HVAC_TAB
20.5 M5.0	ABN Fourth Floor West HVAC_TAB
20.5 M5.1	ABN Fourth Floor East HVAC_TAB

1.9 EVALUATION OF BIDS

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

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

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

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

- A. Experience and success of both company, lead mechanic, and/or lead mechanic complete at least three (3) projects of similar scope, complexity and overall cost.
- B. A minimum of ten (10) documented years of experience in project supervision by lead HVAC mechanic. Bidders shall submit a resume of named HVAC mechanic at the preconstruction meeting. See Section 01300 – Submittals and Shop Drawings.
- C. Proposal prices, base bid, and cost of any or all alternates listed.
- D. Review of all required submittals.
- E. Past record with the City (including satisfying safety requirements).
- F. Bidder's responsibility based on, but not limited to:
 - 1. Ability, capacity, organization, technical qualifications and skill to perform the contract or produce the services required.
 - 2. Contractor's construction record including references, judgment, stability, adequacy of equipment proposed to be furnished.
 - 3. Whether the contract can be performed within the time specified as outlined within the anticipated project per Section 01010, 1.4 Commencement, Prosecution and Completion.
 - 4. Quality of performance of previous contracts or services

1.10 LOCAL EMPLOYMENT AND APPRENTICESHIP TRAINING PROGRAM (LEAP)

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

LEAP is a City of Tacoma economic development program adopted to provide employment opportunities for City of Tacoma residents on qualifying City funded projects. It requires the prime contractor or service provider performing a qualifying public works project or service contract to ensure that 15-percent of the total labor hours worked on the project are performed by apprentices approved by the Washington State Apprenticeship Council (SAC) and/or residents of Tacoma. Compliance may be met through any combination of utilizing residents of Tacoma or SAC apprentices on the project. Residents entering apprenticeships or other related training programs may be screened to work on City public works projects or service contracts.

Contractors/vendors may obtain further information by contacting the City's LEAP Contract and Program Auditor, Clifford Armstrong, at 253-591-5826 or e-mail Clifford Armstrong at carmstrong@cityoftacoma.org. The LEAP coordinator can assist contractors in the recruitment of qualified employees from the Private Industry Council and other pre-employment and training organizations available in the area. The LEAP Office is located in the City's Community & Economic Development Department, Tacoma Municipal Building, 747 Market Street, Room 808, Tacoma, Washington 98402.

1.11 PREVAILING WAGES

In addition to the requirements of Section 3.08(B) of the General Provisions, the contractor shall be required to post on the job site a copy of the intent form to pay prevailing wages.

As identified in the General Provisions, the contractor shall comply with the law regarding prevailing wages. These rules apply to any contractor who does business with the City, including owner/operators.

A Statement of Intent to Pay Prevailing Wages **MUST** be filed with the Washington Department of Labor & Industries upon award of contract. An Affidavit of Wages Paid **MUST** be filed with the Washington Department of Labor & Industries upon job completion.

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

<https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-rates/>

1.12 PERFORMANCE (SURETY), PAYMENT AND RETAINAGE BONDS

A. PERFORMANCE (SURETY) AND PAYMENT BONDS

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

B. RETAINAGE BOND

A 5-percent retainage bond may be provided in lieu of the City withholding five-percent retainage. If a retainage bond is not obtained, the City will withhold 5-percent retainage until the end of the contract. If a retainage bond is provided, the City form must be used.

Contractor shall provide notice of intent to provide retainage bond ten (10) days prior to first invoice.

1.13 WORK BY CITY

The City will award separate work related to this overall project.

Items noted '**NIC**' (not in contract) on the drawings will be furnished and installed by the City operating before or concurrently with the work of this contract, and are not included in this contract:

- A. Electrical disconnect, main feeder, conduit and grounding from building MCC to new fan-wall located in fan room.
- B. All line voltage electrical power (120 volt and above).

END OF SECTION

SECTION 01025 - MEASUREMENT AND PAYMENT

1.1 ADMINISTRATION

A. AUTHORITY

Payment will be made monthly based on the schedule of values. Percent completion will be calculated by the engineer based on schedule of values and material on hand. Material not on the project site will not be paid for. Once material is on hand, it will be considered part of the job and shall not be removed for any reason until the entire job is complete.

The City will make payments for major pieces of equipment and for large lots of materials for larger projects. If a line item for installation and commissioning exists in the schedule of values, the engineer may elect to pay 100-percent of the material or equipment cost. If such line items are negligible as compared to the cost of the equipment, the engineer, at his discretion, may elect to hold up to 20-percent of the cost of major equipment or materials until such a time as the equipment is installed, tested, and accepted by the City.

If the City elects to make payment for major pieces of equipment, the equipment shall still belong to the contractor until the equipment has been installed and fully commissioned to complete operations conditions. Any payment for equipment or material shall not be construed as acceptance, and the contractor shall warrant all equipment as if not paid for by the City.

In case work is suspended, nearly suspended, or in case only unimportant progress is being made, the engineer may, at their discretion, make progress estimates at longer intervals than once a month.

Modify Section 2.14 of the General Provisions as follows.

Invoices shall be mailed to the attention of:

Business Systems

Tacoma Power
Generation/Plant Engineering
3628 South 35th Street
Tacoma, Washington 98409

NOTE: All questions regarding contract status or payments should be directed to the project engineer.

B. UNIT QUANTITIES SPECIFIED

Quantities indicated in the proposal are for bidding and contract purposes only. Quantities and measurements supplied or placed in the work and verified by the engineer and contractor determine payment.

Adjustments to contract prices due to changes in quantity shall be in accordance with the latest edition of the Standard Specifications, unless otherwise modified by this specification.

The City reserves the right to delete any bid item from the contract by notifying the contractor in writing of its intent. In the event of deleted work, the contractor's sole compensation shall be the money due the contractor for materials that had been purchased and obtained by the contractor prior to the deletion of the work.

C. CONTRACT PRICE

The lump sum and unit bid prices shall be full and complete compensation for the contract work stated, together with all appurtenances incidental thereto, including materials, equipment, tools, labor, and all the costs to the contractor for completing the contract in accordance with the plans, specifications, and instructions of the engineer.

All work not specifically described or mentioned in these specifications, but are required to be constructed to achieve complete and operable systems, structures or amenities shall be considered incidental items of work, not separately compensable, and its price included in items of work specified in the specifications.

D. NON-PAYMENT FOR REJECTED OR SURPLUS PRODUCTS

Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable
2. Products determined as unacceptable before or after placement
3. Products not completely unloaded from the transporting vehicle
4. Products placed beyond the lines and levels of the required work
5. Products remaining on hand after completion of the work
6. Loading, hauling and disposing of rejected products

E. WORK INCIDENTAL TO BID ITEMS

The following list indicates work which shall be considered incidental to the appropriate bid item as listed in the proposal:

1. Safety barricades to keep work area separated and safe.
2. Seismic Support Systems.
3. Mobile Crane Services.

F. ALLOWANCES

Not Used

1.2 PROPOSAL ITEMS

BID ITEM 1. ADMINISTRATION BUILDING NORTH (ABN) FAN-WALL

A. MEASUREMENT

The work under this bid item will include all labor, materials and equipment required to modernize the Administration Building North (ABN) supply fan with a new Fan-Wall in accordance with the attached plans and specifications.

B. PAYMENT

Measurement of payment will be lump sum (LS) for replacing the existing single supply fan with a new Fan-Wall system. Measurement of payment will include all labor, equipment, materials and necessary tools to perform all work to modernize to a new Fan-Wall system at the Tacoma Public Utilities. Payments will be subject the "Schedule of Valves" and percent of work completed as listed in the proposal.

BID ITEM 2. FORCE ACCOUNT, PER LUMP SUM

A. MEASUREMENT

Measurement will be made for Force Account in accordance with Section 1-09.6 of the latest edition of the Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation as modified by Force Account Work in the Special Provisions or on negotiated lump sum or unit price change orders added to the contract.

B. PAYMENT

Payment shall be made for change order items added to the contract which shall be treated as a deduct to the force account remaining available.

"Force Account," as listed in the proposal

1.3 SCHEDULE OF VALUES LIST

The following listing (as applicable) shall be used by the contractor as a minimum breakdown for Schedule of Values required for this project.

For each item, the contractor shall determine the unit of measure such as lump sum (LS), per each (EA), etc., and as approved by the engineer. The Schedule of Values shall include the cost of labor, material and equipment for each item.

1. Mobilization, safety barricades, and setup (not otherwise listed below)
2. As-Built Drawings
3. General Submittals.
4. Demo of old filter racks, racking, and structure.
5. Fabrication of new Structural Fan-Wall supports
6. Controls (Automatic Temperature Controls – ATC)
7. Room wall enclosures, panels, doors, etc.
8. Installation of new filter racks and filters
9. Installation of new Fan-Wall
10. Demo of old Single Supply fan
11. Installation of new duct-work supply.
12. Pre Commissioning of new Fan-Wall (before old fan removal)
13. Final Commissioning of new Fan-Wall (after old fan removed)
14. Testing, adjusting and balancing
15. Final testing and certifications.
16. Owner training
17. Punchlist (maximum 2-percent of Bid item total)
18. Demobilization/Closeout

1.4 FORCE ACCOUNT WORK

This section supersedes Section 3.10, Paragraph C of the General Provisions.

In certain circumstances, the contractor may be required to perform additional work. Where the work to be performed is determined to be extra and not attributed to the contractor's negligence, carelessness, or failure to install permanent controls, it shall be paid in accordance with the unit contract price or by force account.

Such additional work not covered by contract items will be paid for on a force account basis in accordance with Section 1-09.6 of the Standard Specifications or as a negotiated change order with lump sum or unit price items. For the purpose of providing a common proposal for all bidders and for that purpose only, the City has estimated the potential cost of force account work, and has entered the amount in the bid proposal to become a part of the total bid by the contractor. However, there is no guarantee that there will be any force account work.

1.5 NON-PAYMENT FOR REJECTED OR SURPLUS PRODUCTS OR WORK

Payment will not be made for work rejected by the City. Products or work not meeting contract requirements shall be replaced by the contractor at no expense to the City, regardless of the impact to work, schedule or cost.

1.6 AS-BUILTS

The final payment of this contract will not be released until complete "AS-BUILT" plans are received and approved by the engineer.

END OF SECTION

SECTION 01040 - PROJECT COORDINATION

1.1 PROJECT ENGINEER/LEAD

The project engineer/lead shall be herein referenced as engineer in these specifications.

Construction management for this project with whom the contractor shall coordinate all their activities will be Mr. Jay Madden at 1-253-502-8366 once the notice to commence work is issued. Any changes to these specifications or plans shall be approved by this engineer prior to commencing any work.

For all pre-award questions contact Doreen Klaaskate, Purchasing, at dklaaskate@cityoftacoma.org.

1.2 MEETINGS

A. PRE-BID MEETING

All bidders are invited to attend a pre-bid meeting as listed in the bid proposal. Call Jay Madden at 253-502-8366 to confirm your attendance.

If you are unable to attend this meeting, please call the EIC (Equity in Contracting) Office at 253-591-5224, and/or the LEAP (Local Employment and Apprenticeship Program) Office, at 253-591-5826, for instructions in filling out the EIC/LEAP forms or for questions concerning these requirements.

B. PRE-CONSTRUCTION MEETING

Following award of the contract, the engineer will notify the selected bidder of the time and date of the pre-construction meeting to be held at the project location or the Third Floor Engineering Conference Room, Tacoma Public Utilities Administration Building, 3628 South 35th Street, Tacoma, Washington.

Minutes of the pre-construction meeting will be sent to the contractor and all meeting attendees. Recipients of the pre-construction meeting minutes will be required to direct any comments or changes to these minutes to the engineer within seven (7) days from the date of receipt. If no changes or comments are received within the seven (7) days, the meeting minutes will be kept by the engineer and become part of the project file.

C. SITE MEETINGS

The engineer will schedule weekly meetings at the project site prior to each major phase or section of work; prior to installing major pieces of equipment as identified by the engineer; and on an as-needed basis. Attendance is required of the contractor, site lead mechanic, and major subcontractors at all such meetings. The engineer will notify the contractor of all required site meetings during the pre-construction meeting. Agenda will follow the same format as the pre-construction conference for applicable items.

Minutes of the weekly site meeting will be sent to the contractor and all meeting attendees. Recipients of the pre-construction meeting minutes will be required to direct any comments or changes to these minutes to the engineer within seven (7) days from the date of receipt. If no changes or comments are received within the seven (7) days, the meeting minutes will be kept by the engineer and become part of the project file.

1.3 PERMITS

The City has made application to the applicable authorities for the following permits:

A. City of Tacoma Planning and Development Services

The contractor will be responsible for picking up these permits. Reimbursement for the actual permit fee will be made under the Force Account item or paid by the City directly to the agency, as applicable.

The contractor shall apply for, obtain and pay for all other required permits as set forth in Section 3.02 of the General Provisions.

The City will issue to the contractor a complimentary electrical permit at the Utility's Electrical Permit Counter. Questions concerning this process shall be directed to the project engineer.

1.4 COORDINATION WITH OTHERS

A. OPERATION OF EXISTING FACILITIES

The facilities or portions of facilities within the project limits must be kept in continuous operation throughout the construction period. No interruption will be permitted which adversely affects the degree of service provided. Provided permission is obtained by the City in advance, portions of the existing facilities may be taken out of service for short periods.

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

The contractor shall also be responsible to minimize disruptions to building occupants during working hours 7:00 a.m. to 4:00 p.m., Monday through Friday.

Contractor shall provide temporary facilities and make temporary modifications as necessary to keep the existing facilities in operation during the construction period.

The contractor shall be responsible for coordinating and scheduling the work to be performed by the City so that it coincides with the contractor's work.

All construction activities shall be coordinated daily with the engineer or their designated representative. Changes to the schedule that will impact on dates shown as milestones on the schedule shall be coordinated with the engineer on a daily basis.

The City will be using this facility for ongoing daily operations.

The contractor shall become familiar with the ongoing operations and include all coordination required as part of the bid. The contractor shall follow all requirements of the City and do all coordination as part of the required work.

B. SCHEDULE AND COORDINATION OF WORK

The contractor shall coordinate scheduling, submittals, and all work specified herein to assure efficient and orderly sequence of the installation of interdependent construction elements with provisions for accommodating items installed later.

1.5 DIVISION OF WORK

A. MATERIAL FURNISHED AND INSTALLED BY CONTRACTOR

The contractor shall furnish and pay for all necessary materials (except City-furnished) and shall provide all labor, tools, equipment and lead mechanic, and perform all work incidental to the completion of the project as contemplated by this contract in accordance with the plans, specifications, and instructions of the engineer.

Each subcontractor shall furnish and install all materials and equipment unless otherwise specified.

Requests for use of alternate materials shall be submitted prior to bid opening in accordance with Section 01300, Paragraph 1.4 – “Or Equal” Clause or Substitutions.

B. CITY-FURNISHED MATERIAL INSTALLED BY CONTRACTOR

All material received by the contractor shall become their responsibility and the contractor shall be liable for any materials lost or damaged after receipt.

The City will provide:

1. No Materials

C. WORK TO BE DONE BY CITY

The City will provide all materials and perform all work to:

1. Main electrical power disconnect, main feeders, conduit and MCC bucket disconnects for new fan-wall system.
2. Removal of hazardous material – asbestos and lead.

Notify the engineer a minimum of four (4) days prior to needing any work performed by the City.

Items noted N.I.C. (not in contract) on the drawings will be furnished and installed by the City before or concurrently with the work of this contract and are not included in this contract.

The contractor shall be responsible for coordinating and scheduling the work to be performed by the City so that it coincides with their work.

1.6 LIMITATION OF CONTRACTOR'S WORK AREA/OR CONTRACTOR'S USE OF PREMISES

A. BARRIERS

Dividing work area from area in City use.

B. WORK BY OTHERS AND WORK BY CITY

At the time of construction of the ABN Fan-wall project, several other contractors will be on site performing other construction projects. The contractor shall coordinate all activities with the City during the construction period.

C. CONTRACTOR'S USE OF PREMISES

All requests for use of areas not designated for use by the contractor shall be made in writing to the engineer for approval at least four (4) days in advance of the need. The engineer shall approve those areas for use prior to use by the contractor.

1.7 HAZARDOUS MATERIALS

The City has tested areas of work to be disturbed during construction. The contractor is required to follow all local, state, and federal laws pertaining to the disturbance, removal, handling, storing, transporting, and disposal of all materials deemed hazardous by law.

All work shall be performed by workers certified by Washington State Department of Labor and Industries as having successfully completed a state approved training course. All work shall be in accordance with EPA Title 40 CFR.

1.8 CONTRACT CHANGES

The City has developed four (4) forms to facilitate and track communications with the contractor. These are the **Request for Information (RFI)**, **Engineering Change Directive (ECD)**, **Proposal Request (PR)**, and **Change Order Proposal (COP)**. These forms are included at the end of the Special Provisions.

The **Request for Information (RFI)** shall be used by the contractor whenever written direction on conflicts in plans, insufficient or unconstructable detail is shown, or any other issue which should be documented arises. The City may also use the form to inquire on contractor's methods, schedule or other issues not warranting more formal letter correspondence. The contractor shall maintain the numbering system and, as such, any issued by the City will be unnumbered until delivered to the contractor.

The **Engineering Change Directive (ECD)** shall be used by the City to transmit new or revised drawings, issue additions or modifications to the contract or furnish any other direction which should be documented. Directives are effective immediately. Should the contractor believe that such Directive should result in either a change in cost or time for the project, they shall notify the engineer prior to commencing such work and, if possible, submit a **Change Order Proposal** prior to the start of such work, but in no case, more than seven (7) days from receipt of said Directive.

In the event the City does not receive a **Change Order Proposal** from the contractor within seven (7) calendar days of the contractor's receipt of a Directive from the City, the contractor shall have no claim for extra cost or time or impacts attributable to the work required by the Directive. (Directives are numbered by the City.) Once the City and the contractor have established a price for the changes required by the Directive or any other request by the City for a change in the work, and a **Change Order Proposal** issues reflecting the agreed upon price, it is agreed and understood that the price reflected by the **Change Order Proposal** shall include all direct costs, indirect costs, and the contractor's estimate of impacts to its work, including but not limited to delay impacts, and shall represent a full and final settlement of all issues pertaining to the work required by the Directive, and work performed by the contractor up to the date of the **Change Order Proposal**.

The **Proposal Request (PR)** shall be used by the City to request pricing on a possible change in plans or additional work. The PR may also be used to request credits for deletion or changes in scope of work. The contractor shall respond to such requests with a **Change Order Proposal** within seven (7) days from receipt of said Request unless more time has been agreed to. Requests are numbered by the City.

The **Change Order Proposal (COP)** shall be used by the contractor to respond to City issued Proposal Requests, Engineering Change Directives or when the contractor believes that changed conditions or omitted, but necessary, work items exist. The COP may be used for requested changes in cost or time of the contract. COPs shall be numbered by the contractor, and, in the case of revision or resubmission of the same basic COP, the number shall be hyphenated with the letter "B", "C", etc.

1.9 DIFFERING SITE CONDITION

Differing site conditions shall be administered in accordance with Sections 1.04.5, 1.04.7, and 1.09.11 of the Standard Specifications except as stipulated in these Special and General Provisions. Contractor shall have no claim for additional costs or work, if it fails to submit a written RFI to the City immediately upon encountering any differing site condition, conflicts in the plans, specifications, or constructability issues.

The contractor shall promptly, and before conditions are disturbed, notify the engineer or their field representative of problems with subsurface conditions at the site, problems or conflicts in the plans or specifications or problems on constructability. A written **Request for Information (RFI)** shall be submitted by the contractor when such problems and direction are required.

The engineer shall promptly investigate the conditions, and if agreed upon with the contractor, adjustment shall be made on the appropriate details in writing to facilitate construction. The response may be on the **RFI** or may necessitate an **Engineering Change Directive (ECD)** or **Proposal Request (PR)**. No claim by the contractor under this differing site condition shall be allowed except as agreed upon in writing with the engineer.

Whenever possible, should the City desire extra work to be performed a **Proposal Request (PR)** shall be sent to the contractor.

Whenever possible, the contractor shall submit in advance and in writing, a **Change Order Proposal (COP)** for changes in the scope of work and/or contract amount. This proposal shall be either accepted or rejected in writing by the project engineer prior to work commencing. When no agreement can be reached, the City may order extra work on force account.

When time is short, the contractor shall notify the City extra work is required or the City shall notify the contractor that extra work is needed and at a minimum, the engineer shall issue a handwritten **Engineering Change Directive**. In such cases, said handwritten **Directive** will not be considered as agreement that such work is extra. Within seven (7) days, the contractor shall submit a written **Change Order Proposal** for changes in the scope of work and/or contract amount.

1.10 CONSTRUCTION PROGRESS SCHEDULES

A. FORMAT

The contractor shall prepare schedules as a horizontal bar chart with separate bar for each major portion of work or operation, identifying the first work day of each week and include holidays and times when facility will not be available to contractor for City installed work.

B. CONTENT

This schedule shall be activity-oriented showing as nearly as can be determined the starting and completion dates of each event. The schedule shall show the materials delivery, structure erection, and installation. It will include the start and completion of each major civil, structural, mechanical, communications and electrical item of work critical to the general contractor's operation.

Show complete sequence of construction, by activity, with dates for beginning and completion of each element of construction.

Identify each task by the appropriate proposal bid item number and subcontractor responsible.

As a minimum, the following tasks shall be included on the schedule:

1. Notice to Proceed (NP)
2. Submittals and drawings
3. Equipment procurement
4. Demolition Phase 1 – filter racks, existing structure
5. Modernization of Fan-Wall
6. Work by City of Tacoma
7. Subcontractor phase of work
8. Pre-commissioning/Testing - TAB
9. Demolition Phase 2 – Existing Fan
10. Modernization of new room walls and interior air flow directional walls
11. Final commissioning/Testing – TAB
12. Final

C. SEQUENCE SCHEDULING

It shall be the contractor's responsibility to properly phase in all work specified herein including all work done by subcontractors.

Progress schedules are required to be coordinated with Tacoma Power and updated monthly or when changes occur. Acceptance or approval of the progress schedule does not release the contractor from the responsibility to provide the necessary resources to meet the schedule.

D. SUBMITTALS

The contractor shall submit initial schedules at the preconstruction meeting or at a minimum of within ten (10) working days after the contract award. After review, if changes are required by the engineer, resubmit required revised data within ten (10) working days.

The contractor shall use the attached Submittal Transmittal form (electronic version is available from the engineer) for all submittals.

Within twenty (20) days of the date of the contract, the contractor and the engineer will reach an agreement on any and all adjustments and all modifications to the submitted schedule which are warranted. The schedule, thus modified, will become part of the contract.

The failure of the contractor to submit a schedule(s), or the inability of the contractor and the City to reach an agreement as to modifications to a schedule, shall not excuse the contractor's obligation to perform the work required by the specifications in the number of days required by the specification.

Once a month, the City's and the contractor's site representatives will meet and perform a "Line-to-Line" review of items on the schedule, illustrating their plan for meeting the completion dates specified in this contract and the associated construction costs for each subcontractor and/or construction phase percent complete.

1.11 CITY OCCUPANCY

The City reserves the right to use or to occupy any substantially completed part of the project, and to use equipment installed under the contract prior to the date of final acceptance. Such use of occupancy shall not constitute acceptance of the work, or any part thereof.

During construction, normal operations will be ongoing at the Tacoma Public Utilities Administration Building. Normal operations include the normal operations of the building supply fan which provides the HVAC ventilation for the entire ABN building.

The contractor shall maintain continuous services for electrical, lighting, and HVAC for adjacent areas and quadrants for the duration of the project. All scheduling of power loss shall be done during the hours of 5:00 p.m. to 11:00 p.m. on normal working days.

Removal of demolition material, transportation of new construction material, and work involving rotor hammers or other noisy equipment shall be done during the hours of 5:00 a.m. to 7:30 a.m. and hours of 6:00 p.m. to 11:00 p.m. daily. Work that results in higher than acceptable levels of noise or excessive disturbance of personnel will be done during the hours of 5:00 a.m. to 7:30 a.m. and hours of 6:00 p.m. to 11:00 p.m. at the direction of the engineer and at no additional cost to the City.

Existing main fan removal shall be scheduled during Saturday, Sunday, and/or holiday days at no additional cost to the City. Refer to Section 01010, 1.6 Contract Work Times.

The contractor will cooperate with the City to minimize conflict and to facilitate the City's operations.

The contractor will schedule the work to accommodate this requirement.

1.12 LEAD MECHANIC (LEAD HVAC MECHANIC)

The contractor shall permanently employ a competent lead mechanic (foreman) who shall be present at the project site at all times during the entire progress of the work, except those times when the contractor is demobilized. A lead HVAC mechanic may be approved as a foreman as long as the mechanic will be assigned to the project, and shall have full authority to act on their behalf.

A. LEAD HVAC MECHANIC (OR FOREMAN)

The lead HVAC mechanic shall be on site even when a subcontractor is working, unless otherwise approved by the engineer. The foreman shall be satisfactory to the Contractor, and shall have full authority to act on their behalf.

It will be the foreman's responsibility to have a set of plans and specifications on the project site during the progress of the work. The foreman shall mark or record on the plans all changes made during construction. Such redline "AS-BUILT" plans shall be available to the engineer at all times and shall be delivered to the engineer upon completion of the work.

The lead mechanic initially assigned to the project by the general contractor shall remain lead mechanic for the duration of the contract. If the lead mechanic is replaced, all work shall stop until an additional preconstruction meeting with the City is held. This work stoppage will be at the contractor's expense. The completion date shall remain unchanged, regardless of any work stoppage.

1.13 CLEAN UP

In addition to Section 3.11 - Cleaning Up of the General Provisions

A. DAILY

All areas shall be left safe, clean and free of debris.

Clean up is considered incidental to the project and no payment will be allowed.

Collect waste daily and when containers are full, legally dispose of waste off site.

Clean-up of any area impacted by the construction shall be done weekly or as directed/instructed by the engineer.

END OF SECTION



CHANGE ORDER PROPOSAL (COP)

(This form shall be used by the contractor to respond to City issued Proposal Requests, Engineering Change Directives or when the contractor believes that changed conditions or omitted, but necessary, work items exist. The COP may be used for requested changes in cost or time of the contract.)

COP No.:

(Contractor Assigns)

REF. Doc.:

(Initiating a RFI, ECD or PR)

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:

Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Title: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

Scope of Change:

Initiated By: _____ Representing: _____
(Name) (Company)

Cost/Credit: _____ Time Extension Request: _____

Attachment Type: _____
(Supporting Documentation)

This change order proposal shall include ALL labor, material, equipment, subcontractor costs, mark-ups including overhead, profit, any other direct and/or indirect costs, and any requests for additional time associated with the change in the scope of work.

City's Response:

Action: ☐ Approved ☐ Unapproved ☐ Revise and Resubmit (Select only one)

*Prior to any extra work the contractor shall submit a written **Change Order Proposal** (COP). See Section 01040, Contract Changes, of the specification for this Contract.*

Response By: _____ Attachment Type: _____
(Name) (Supporting Documentation)

Representing: _____ Response Date: _____
(Company) (Date)

Cc:



ENGINEERING CHANGE DIRECTIVE (ECD)

(This form shall be used by the City to transmit new or revised drawings, issue additions or modifications to the contract or furnish any other direction which should be documented.)

ECD No.: (City Assigns)

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:

Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Title: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

You are hereby directed to make the following modification(s) in the Scope of Work in this Contract:

This document becomes effective upon receipt by the Contractor, with signature of an approved City representative. The Contractor shall then commence with modifications(s) listed above.

Attachment Type: _____
(Supporting Documentation)

Initiated By: _____
(Name)

Representing: _____
(Company)

Contractor's Response:

This ECD: ☐ Will Not ☐ May ☐ Will (select one box only) result in a claim by the Contractor.

*Prior to any extra work the contractor shall submit a written **Change Order Proposal** (COP). See Section 01040, Contract Changes, of the specification for this Contract.*

Attachment Type: _____
(Supporting Documentation)

Response By: _____
(Name)

Response Date: _____
(Date)

Representing: _____
(Company)

Cc:



REQUEST FOR INFORMATION (RFI)

(This form shall be used by the contractor whenever written direction on conflicts in plans, insufficient or unconstructable detail is shown, or any other issue which should be documented arises; or by the City when additional clarification is required.)

RFI No.: (Contractor Assigns)

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:

Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Subject: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

Requested Information:

Attachment Type: _____ Initiated By: _____
(Supporting Documentation) (Name)

Response Required: _____ Representing: _____
(Date) (Company)

Response:

Attachment Type: _____ Response By: _____
(Supporting Documentation) (Name)

Representing: _____
(Company)

Prior to any extra work the contractor shall submit a written **Change Order Proposal (COP)**. See Section 01040, Contract Changes, of the specification for this Contract.

Response Date: _____
(Date)

City Approval:

The owner (Tacoma Power) reviewed the foregoing request and finds the response to be in order.

Project Engineer: _____ Response Date: _____
(Name) (Date)

Cc:



PROPOSAL REQUEST (PR)

(This form shall be used by the City to request pricing on a possible change in plans or additional work. The PR may also be used to request credits for deletion or changes in scope of work.)

PR No.:

(City Assigns)

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:

Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Subject: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

Scope of Request:

Attachment Type: _____

(Supporting Documentation)

This is not a change order or a notice to proceed with the described work. Prior to any extra work the contractor shall submit a written **Change Order Proposal** (COP). See Section 01040, Contract Changes, of the specification for this Contract.

Initiated By: _____

(Name)

Representing: _____

(Company)

Cc:



CONTRACTOR SUBMITTAL TRANSMITTAL

Submittal No.:

(Contractor Assigns)

Date: _____

Project Title: _____

Specification No.: _____ Contract No.: _____

Contractor:

Owner:

Tacoma Power/Generation
3628 South 35th Street
Tacoma, WA 98409

Subject: _____

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other

Sending the Following Item(s):

☐ Submittals ☐ Product/Data ☐ Samples ☐ Plans ☐ Shop Drawings ☐ Copies
☐ Specifications ☐ Contract ☐ Other: _____

Copies	Section	Description of Product/Data	Manufacturer

Transmitted as:

☐ For Approval ☐ For Your Use ☐ Per Your Request ☐ For Review and Comment
☐ Other: _____

Remarks:

For Use by Architect/Engineer:

☐ No Exception Taken ☐ Make Corrections Noted ☐ Revise and Resubmit ☐ Rejected (See Response)

Corrections or comments made on the shop drawings during this review do not relieve Contractor from compliance with the requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all other contractors and agencies performing his work in a safe and satisfactory manner.

Response Date: _____ Response By: _____
(Date) (Name)

SECTION 01300 - SUBMITTALS AND SHOP DRAWINGS

1.1 SUBMITTALS REQUIRED/REQUESTED WITH BID

In addition to the items listed in the Bidders Checklist, the bidders **shall** submit with their bid package the following information. This information may be used for evaluation purposes.

1. Provide complete (anticipated) schedule showing project schedule construction time-line. Break into separate scheduled phases:
 - a. Construction design layout and detailing phase
 - b. Equipment procurement phase
 - c. Construction and demolition phases
 - d. Commissioning phase.

1.2 DOCUMENTS REQUIRED AT PRECONSTRUCTION CONFERENCE

- A. Work Hazard Analysis Report as required in Paragraph 3.05(B) of the General Provisions.
- B. Construction Schedule as required in Section 01040 – Project Coordination.
- C. List of Subcontractors, including each subcontractor's address, telephone number, and contact person to be used on this project.
- D. List of Number and Names of Workers, Equipment List, and Working Site Layout or Requirements.
- E. List of Products.
- F. List of Principal Suppliers and Fabricators.
- G. Experience and success of both company and lead mechanic completing at least three (3) projects of similar scope, complexity, and overall cost. A detailed list of comparable projects with current list of contacts shall be submitted with the bids.
- H. A minimum of ten (10) documented years experience for lead mechanic in modernizing building HVAC systems. Bidders shall submit a resume of named lead mechanic with their bids.
- I. A summary of the procedure to be employed in the construction of the ABN Fan-wall and any special techniques to be incorporated.
- J. Contingency plans if problems occur with the proposed techniques or if primary equipment fails.

K. SCHEDULE OF VALUES (IF LUMP SUM BID)

Submit a detailed list of items to be included in the Schedule of Values within five (5) days of award of contract for approval by the engineer.

Submit a schedule of values within ten (10) days after award of contract for all components of the construction. Schedule of values will be used by the engineer to calculate monthly payment for percent completion as indicated in Section 01025.

Use the specification Table of Contents as a guide to establish the format for the Schedule of Values. Provide at least one (1) line item for each product or work function in each specification section and component of work to include pricing such as to lump sum (LS), per each (EA), linear feet (LF), ton (TON), or cubic yard (CY) prices as approved by the engineer.

1. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division
 - b. Description of Work
 - c. Section of Work
 - d. Phase of Work
 - e. Name of Supplier
 - f. Change Orders (Numbers) that Affect Value
 - g. Dollar Value either in dollars or as a percentage of the contract sum rounded to the nearest one-hundredth percent, adjusted to total 100-percent.
2. Provide a breakdown of the contract sum in sufficient detail to facilitate continued evaluation of applications for payment and progress reports. Coordinate with the project manual table of contents. Break principal subcontract amounts down into several line items.
3. Round amounts to nearest whole dollar; the total shall equal the contract sum.
4. Provide a separate line item in the Schedule of Values for each part of the work where applications for payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

L. SCHEDULE UPDATING

Update and resubmit the Schedule of Values prior to the next application for payment or when change orders or engineering change directives result in a change in the contract sum as directed by the engineer.

1.3 SUBMITTALS AND SHOP DRAWINGS DURING CONSTRUCTION

See also Section 23 05 00 – General Provisions for heating, ventilating, and air conditioning (HVAC) and the remaining Division 23 - Specifications for required submittals.

Submittals and shop drawings submitted to the City as specified herein are intended to show compliance with the contract documents. Signatures, corrections or comments made on submittals do not relieve the contractor from compliance with requirements of the drawings and specifications. Neither does acceptance or approval of submittals by signature add to or delete from any contract requirements resulting from these specifications regardless of the wording of the submittals. Submittals will not be reviewed or approved when the term "By Others" is used. Submittals are reviewed or approved for general conformance with the design concept of the project and general compliance with the information given in the contract documents.

The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating their work with that of other contractors and agencies, and performing their work in a safe and satisfactory manner. Piece-mealing of submittals will not be accepted.

A. SCHEDULE OF SUBMITTALS

1. Within ten (10) days of notice to proceed, prepare schedule of submittals for shop drawings, product data, samples, and as specified for each section. Update as requested by engineer.

2. List submittals sequentially by project manual table of contents section numbers and titles.
3. Indicate specified time allocated for review, turn around and distribution.
4. Within ten (10) days after notice to proceed, and in accordance with the conditions of the contract, submit list of major products proposed for use with name of manufacturer, tradesman, and model number of each product.
5. For products specified only by reference standards, give manufacturer, tradesman, model or catalog designation and reference standards.

B. SHOP DRAWINGS

1. Number and Format: Submit two (2) copies of each size.
2. Submittal Procedure: Submit for engineer's review in accordance with submittal procedures specified in this section. After approved drawings are return, the contractor shall reproduce and distribute copies to subcontractors and other entities, as applicable. Maintain one (1) copy of each shop drawing at field office and one (1) for project record documents to be delivered to the engineer at project completion.
3. Maximum Sheet Size: 24-inches by 36-inches or other allowable sizes of 8-1/2-inches by 11-inches or 11-inches by 17-inches.
4. Identification: Reference shop drawing details same as reference on contract documents, including sheet and detail descriptions, schedules and room numbers. Indicate by whom materials, products, work, and installations are supplied, performed or installed. Do not use the expression "by others".
5. Presentation: Hand drafted or computer generated, delineated to present information in a clear and thorough manner. Freehand drawings not approved.
6. Variations from Contract Documents due to Standard Shop Practices: Make transmittal outlining variation.
7. Engineer Changes to Submittals which affect Contract Sum or Contract Time: Do not distribute to being work related to submittal. Notify engineer immediately.
8. Mechanical and Electrical Utilities, Equipment and Appliance: Include electrical characteristics, connection requirements, rough-ins, location of outlets, wiring, piping diagrams, weight where significant, and as required to describe installation requirements.

C. PRODUCT DATA

1. Number of Copies: Submit two (2) copies to be retained by the engineer.
2. Submittal Procedures: Submit for engineer review in accordance with submittal procedures specified in this section. After review, distribute to subcontractors and other applicable entities. Maintain one (1) copy for project record documents to be delivered to engineer at project completion.
3. Identification: Mark each copy to identify specific products, models, options, tolerances, dimensions, and other pertinent data.
4. Manufacturer's Standard Data: Modify drawings and diagrams to delete inapplicable information. Supplement to provide pertinent information unique to project.

5. Mechanical and Electrical Utilities, Equipment, and Appliance: Where not shown by shop drawings, include electrical characteristics, connection requirements, rough-ins, location of outlets, wiring, piping diagrams, controls, weight where significant, and as required to describe installation requirements. Correct published product data to correlate with specific project requirements.

D. ELECTRONIC FILES OF MANUALS (FROM VENDORS):

1. Electronic manuals must be submitted in .PDF and compatible with the latest version of Adobe Professional.
2. Manuals should be scanned at 300 DPI (minimum).
3. Color originals should be scanned to color images if possible.
4. All .PDF files should be scanned at using Optical Character Recognition (OCR)
5. A manual must be submitted as a single .PDF file; addendums and attachments (may or may not include drawings) should not be submitted separately, or in different file formats.
6. Manuals that consist of multiple volumes should be submitted as individual files.
7. Manuals comprised of several sections or chapters should be bookmarked by the vendor.
8. If a vendor wished to include security settings (so that their documents are "read-only"), that is acceptable provided that Tacoma Power can view and print from the file.

E. MANUFACTURER INSTRUCTIONS AND CERTIFICATES

Number: Submit one (1) copy of both the manufacturer instructions and certificates.

Content: Include manufacturer's printed instructions for delivery, storage, preparation, assembly, installation, start-up, adjusting, balancing, and finishing as specified for individual specification sections. Include special procedures, project conditions, and environmental criteria required for application or installation.

F. CODE COMPLIANCE CERTIFICATES

Submit information required as a condition of building permit issued by code authority, including certificate of occupancy, certificate of approval from Fire Marshal, and certificate of code compliance from state electrical inspector.

1.4 "OR EQUAL" CLAUSE OR SUBSTITUTIONS

A. GENERAL

When the engineer approves a substitution, it is with the understanding that the contractor guarantees the substituted article to be equal to, or better than, the article specified. The engineer will judge the suitability, reliability, and service availability of a proposed substitute. To be considered by the engineer, the request for substitution shall be accompanied with complete physical and technical data, manufacturer's catalogue data, photographs, samples, and the address of the nearest authorized service representative, as applicable.

This project has been designed around the fan array (fan-wall) units by the named manufacturer indicated in the attached plans and specifications.

1. Alternate manufacturers may be used provided the same type of fan array device is used; however, any redesign to the mechanical, electrical, structural or general construction to accommodate such an alternate manufacture shall be proved by the contractor.
2. Alternate redesign shall meet the requirements and have the approval of the engineer prior to fabrication.
3. Contractor shall submit complete shop drawings showing all alternate unit installation plans and details and all drawings shall comply with Division 23.
4. The alternate redesign shall be equal or superior in all respects to the engineer's design including such aspects as equipment accesses, ease of maintenance, duct connection locations, unit electrical requirements, noise considerations, unit performance, and similar concerns.
5. Cost of redesign and all additional costs incurred to accommodate the alternate manufacturers shall be borne by the contractor.

The decision of the engineer on "OR EQUALS" shall be final.

The requirements of General Provision 2.15 - Approved Equals also apply.

B. PRIOR TO BID OPENING

Substitution approvals will be considered prior to the bid opening if the bidder submits their request for substitution not less than ten (10) working days prior to the date set for bid opening. All substitution requests shall be submitted using the "Substitution Request Form" included in the bid packet and shall be sent to the individual as noted at the top of the form. Substitution requests not received by the named individual will not be evaluated and not allowed as a substitution prior to bidding. Submit all requests and product data in triplicate.

Saturday, Sunday and holidays listed in Paragraph 2.14 of the General Provisions are excluded from the calculation of ten (10) days. An addendum listing such approvals may be issued prior to bidding.

Bidders who do not receive prior written approvals of "OR EQUAL" by ten (10) days prior to bid submittal must base their bids on the items specified.

C. AFTER BID OPENING

Proposed substitution and deviation requests shall be reviewed during the time of submittal review.

Substitution and deviation requests will be received and considered only when one or more of following conditions are satisfied:

1. The specified product or method of construction cannot be provided within the contract period and the contractor submittal is submitted within time frame allowed.
2. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
3. The specified product or method of construction cannot be provided in a manner that is compatible with other materials.
4. A substantial advantage is offered to the Owner, in terms of cost, time, or other considerations of merit.
5. The product as specified includes the statement, "or equal" and one of the above conditions governs

The engineer's decision on all substitution or deviation requests shall be final.

END OF SECTION

SECTION 01400 - QUALITY CONTROL

1.1 REFERENCE STANDARDS

Reference to standards, specifications, manuals or codes of any technical society, organization, or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest Standard Specification manual, code, or laws or regulations in effect at the time of opening of bids (or on the effective date of the agreement if there were no bids), except as may be otherwise specifically stated. However, no provision of any referenced standard, specification, manual, or code (whether or not specifically incorporated by reference in the contract documents) shall be effective to change the duties and responsibilities of City, contractor, or engineer, or employees from those set forth in the contract documents.

Any part of the work not specifically covered by these specifications shall be performed in accordance with the applicable section of the latest Edition of the "Standard Specifications for Road, Bridge and Municipal Construction" as prepared by the Washington State Department of Transportation and the Washington State Department of Public Works Association (APWA) as amended by the latest APWA Amendment No. 1 and the latest City of Tacoma Amendment No. 1.

These specifications will herein be referred to as the Standard Specifications.

1.2 INSPECTION, TESTING AND CERTIFICATION

A. INSPECTION

The City inspector will be responsible for insuring that the contractor is complying with the contract plans and specifications.

1. The City will prepare a construction inspection checklist to be presented to the contractor at the preconstruction meeting. The checklist will include all inspections typically required by local, city and county officials as well as other items as deemed important by the engineer.
2. The contractor shall be required to contact the City 24 hours in advance of all of the construction activities listed on the checklist, have the indicated activity inspected, and the City's inspector initial that the work was performed in accordance with the appropriate technical provision.
3. The checklist shall be posted near each structure and be available for review by the City at all times. These inspections shall be in addition to any required inspections by state or local jurisdictions. The City will prepare a suitable checklist for each building to be constructed and present same to the contractor at the preconstruction meeting.
4. Pre-final Inspection: Contractor shall notify the engineer in writing when all work or portions of work are complete and ready for inspection. The engineer will make a "punchlist" and forward the results of same to the contractor who shall promptly correct any deficiencies noted.
5. Final Inspection: Contractor shall notify the engineer in writing when all punchlist deficiencies have been completed. The engineer will promptly set a time for final inspection at which time the engineer and contractor shall jointly inspect the work. The contractor will promptly correct any further deficiencies noted.

B. PERMIT INSPECTIONS

The contractor shall comply with the requirements of all permits. It shall be the contractor's responsibility to contact the permitting authority and schedule all required inspections. The contractor shall notify the Tacoma power inspector of all scheduled inspections.

C. BUILDING ELECTRICAL

The contractor shall obtain an electrical building permit from the City of Tacoma for each structure. Building electrical inspection shall be performed by the City of Tacoma in conjunction with the County permitting authority guidelines.

1. Line Voltage Permit – By City
2. Low Voltage Permit – By Contractor

END OF SECTION

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1.1 UTILITIES

A. ELECTRIC SERVICE

The City will furnish without charge to the contractor 120 volt single phase power at a location specified by the engineer for the contractor's use. The contractor will furnish and maintain all necessary extension cords and adapters in accordance with the applicable rules and regulations. No metering will be required.

B. TELEPHONE SERVICE

The City will not provide telephone service for the contractor. Mobile telephone service is available at the site.

C. WATER

The City will furnish water for use by the contractor at a location specified by the City engineer. The contractor shall furnish all hoses and connectors as necessary to extend water to the job site.

D. SANITARY FACILITIES

The contractor can use the rest rooms available at the Administration Building North. Coordinate use of these rest rooms with the project manager to ensure they are kept clean. Should the contractor fail to maintain the rest rooms, the contractor will be required to furnish sani-cans at their own expense.

E. TEMPORARY FIRE PROTECTION

Provide temporary fire protection until permanent systems supply fire protection needs.

1. Provide adequate numbers and types of fire extinguishers
2. Store combustible materials in fire-safe containers in fire-safe locations
3. Prohibit smoking in hazardous fire-exposure locations
4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

1.2 JOB SHACK

A. JOB SHACK

Job shack not required, the City will provide the contractor an area to use as a temporary office.

B. STORAGE AREA

The City will provide an open storage area to the contractor at the Administration Building North – Fifth Floor. The contractor will restore the storage area to its original condition at the end of the job. The contractor will provide security, as necessary, to safeguard its materials and machinery during construction.

1.3 SECURITY AND ACCESS

A. SECURITY PROGRAM

Contractor shall comply with Tacoma Power's security policies and procedures and take adequate precaution to protect Tacoma Power's property and employees.

B. ENTRY CONTROL

1. Procedures for the entry and exit of contractor's personnel and materials shall be determined at the preconstruction meeting.
2. Contractor shall maintain a current list of contractor and subcontractor personnel available for on-site inspection.

C. RESTRICTIONS AND OPERATIONAL CONTROL

1. Access for Materials: Every effort shall be made to deliver materials to the construction area during the hours of 7:00 a.m. to 4:30 p.m. Only one (1) freight elevator is available for contractor use. Elevators other than the freight elevator shall not be used by the contractor unless noted otherwise and approved by the Engineer.
2. Contractor Operations: Access shall be restricted to the immediate work area and access route identified to be used during construction. Contractor shall confine personnel to the immediate work vicinity while on site.
3. Emergency Site Access during Construction: Fire lanes must remain open during construction.

1.4 SAFETY

In addition to Paragraph 3.05 "Safety" of the General Provisions, the contractor shall:

A. WORK HAZARD ANALYSIS

The contractor and their subcontractors shall thoroughly review the scope of work of the proposed project. The contractor will be responsible to indicate a work hazard analysis on the form of "Contractor's Work Hazard Analysis Report" attached with the proposal; i.e., any known or potential safety issues or phases of construction that may require specific safety procedures as identified by WISHA or OSHA regulations, and/or prudent construction practices; i.e., shoring, fall protection, scaffolding, hazardous materials, asbestos removal, etc.

This report shall be completed and submitted to the engineer before the preconstruction conference. A copy of this report will be forwarded to the City Safety Officer for review. A copy of this report shall be maintained at the work site (accessible to the supervisor).

The City will review the submitted report and may require the contractor to clarify their safety procedures submitted or detail their procedures for ensuring safe working conditions for other working conditions not listed in the original submitted report; and/or explain how the procedures meet current safety regulations. In no case, may the contractor commence work until the Job Hazard Analysis Report has been reviewed and approved by the engineer.

1.5 PROTECTION OF ADJACENT AREAS DURING CONSTRUCTION

The contractor shall take any measures, including but not limited to the ones listed below, to protect adjacent areas from the affects of construction.

Installing temporary walls or barriers to completely divide or separate the work area from ongoing Tacoma Power operations. Visqueen or plastic shall be a minimum of 8 mil thick and shall form a continuous barrier sufficient to stop all construction dust and residue. Temporary walls of plywood may require sound deadening in some areas.

Other work and barrier requirements as directed by the engineer to provide separation between the contractor's work area and ongoing Tacoma Power operations.

The contractor shall take any measures, including but not limited to the ones listed below, to protect adjacent areas and quadrants from the affects of construction.

1.6 DUST CONTROL

Buildings or operating facilities which may be affected adversely by dust shall be adequately protected from dust. Existing or new machinery, motors, instrument panels, or similar equipment shall be protected by suitable dust screens. Proper ventilation shall be included with dust screens.

END OF SECTION

SECTION 01550 - ASBESTOS REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

This work in this section includes all work that will require disturbance and/or complete removal of asbestos-bearing materials.

There may be the potential that additional locations, not accessible to City inspectors, may contain asbestos. Additional asbestos found at the site, but not specifically detailed, shall be removed by the City. The cost shall be paid for by the City.

- A. If the contractor suspects areas contain asbestos, work shall immediately stop until the area can be tested and if found positive, will be removed by the City.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 GENERAL

- A. All asbestos work shall be performed by workers certified by Washington State Department of Labor and Industries as having successfully completed a state approved training course, conforming to Chapter 59.26 RCW.

END OF SECTION

SECTION 01600 - MATERIAL AND EQUIPMENT

1.1 QUALITY OF WORKMANSHIP AND MATERIAL

A. WORKMANSHIP

The contractor shall employ only competent, skillful, and **orderly** persons to do the work. If, in the engineer's opinion, a person is incompetent, **disorderly** or otherwise unsatisfactory, the engineer shall notify the contractor, in writing, of same. The contractor shall immediately discharge such personnel from the work and shall not again employ those person(s) on said contract again. Work shall conform to the highest industry standards.

See General Provisions, Paragraph 3.07 - Contractor - Supervision and Character of Employees for additional requirements.

B. MATERIALS

Materials shall be delivered to the project site in the manufacturer's original containers, bundles or packages unopened with the seals unbroken and the labels intact. Each type of material shall be of the same make and quality throughout. Manufactured articles, materials and equipment shall be installed in accordance with each manufacturer's written directions, unless otherwise specified.

All materials and equipment to be provided under this contract shall conform to the latest edition of the applicable codes, but in no case shall be contrary to the laws of the State of Washington and/or Federal Government.

The equipment supplied shall meet appropriate ANSI, OSHA, WISHA, and all Federal, state, and local standards for the type of equipment provided for its intended use.

Deliver, store and handle products according to manufacturer's written instructions, using means and methods that will prevent damage, deterioration, and loss, including theft.

1. Schedule delivery to minimize long-term storage and to prevent overcrowding construction spaces.
2. Deliver with labels and written instructions for handling, storing, protecting, and installing.
3. Inspect products at time of delivery for compliance with the contract documents and to ensure items are undamaged and properly protected.
4. Store heavy items in a manner that will not endanger supporting construction.
5. Store products subject to damage on platforms or pallets, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required.

1.2 SALVAGEABLE AND NONSALVAGEABLE MATERIAL

A. SALVAGE TO TACOMA PUBLIC UTILITIES

Contractor shall carefully remove in a manner to prevent damage to all materials and equipment specified or indicated to be salvaged and reused or to remain property of the City. The contractor shall store and protect salvaged items specified or indicated to be reused in the work.

Any items damaged in removal, storage or handling through carelessness or improper procedures shall be replaced by the contractor in kind or with new items.

All materials considered salvageable by the engineer's representative shall be accumulated and tightly packaged in a container suitable for the type of materials being salvaged. Salvaged materials not reused on this job shall be returned to Tacoma Power Warehouse, 3628 South 35th Street (rear), Tacoma, Washington, between the hours of 9:00 A.M. and 2:00 P.M., Monday through Friday.

B. PROPERTY OF CONTRACTOR

Demolition, not indicated for salvage, becomes property of contractor. Removed from site at contractor's expense to a legal waste site obtained by the contractor

Materials deemed to be non-salvageable by the engineer's representative shall be disposed by the contractor to a legal dump site obtain by him. All costs to dispose of non-salvageable materials shall be the contractor's responsibility.

The contractor may, if approved by the City, furnish and install new items in lieu of those specified or indicated to be salvaged and reused, in which case such removed items will become the contractor's property. Existing materials and equipment removed by the contractor shall not be reused in the work except where so specified or indicated.

END OF SECTION

SECTION 01700 - CONTRACT CLOSEOUT

1.1 DOCUMENTS REQUIRED UPON COMPLETION OF WORK

A. CLOSE OUT PROCEDURES

The contractor shall notify the engineer in writing when identified tasks are complete and ready for inspection. The engineer will make the inspection, forward the results of same to the contractor, who shall promptly correct any deficiencies noted.

The contractor shall notify the engineer in writing when all punchlist deficiencies have been completed. The engineer will promptly set a time for final inspection, at which time the engineer and the contractor shall jointly inspect the work. The contractor will promptly correct any deficiencies noted.

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

B. FINAL DOCUMENTATION

Upon completion of the work and before final payment is made, the contractor shall deliver to the engineer, in addition to such other items specified in these specifications, the following documents:

1. "AS-BUILT" Drawings

"AS-BUILT" drawings and specifications of new or revised existing work, shown in red ink, provided by the general, mechanical, electrical contractors, and all other subcontractors, including all addendum's, change orders, deviations, changes, elevations, and dimensions of their work from the construction documents, updated monthly during the construction. Monthly payments will not be made until all redlined as-builts are updated.

Two (2) copies of all shop and construction drawings used for the project, the final record drawings ("AS-BUILT" to reflect the actual installation) including one (1) reproducible set of all design drawings and AutoCAD files, if applicable.

NOTE: The final payment for this contract will not be released until "AS-BUILT" drawings are received and approved by the engineer.

2. Maintenance and Operation Manuals

Three (3) complete sets of maintenance and operation manuals and supplement drawings and one (1) electronic manual (.pdf), if necessary, for the care and maintenance of materials and equipment items installed. These manuals shall be prepared by the manufacturer's representatives, and collected and bound in one (1) brochure by the general contractor. The contractor shall also instruct the City's maintenance personnel to such care and maintenance as directed by the manufacturers.

This manual shall include all air handling equipment, air balancing data, electrical and other mechanical equipment. It shall also include all appliances, products selected and other material as herein specified.

The electronic manual shall be formatted as follows:

- a. Electronic manuals must be submitted in .PDF and compatible with the latest version of Adobe Professional.
- b. Manuals should be scanned at 300 DPI.

- c. Color originals should be scanned to color images if possible.
 - d. All .PDF files should be scanned at using Optical Character Recognition (OCR)
 - e. A manual must be submitted as a single .PDF file; addendums and attachments (may or may not include drawings) should not be submitted separately, or in different file formats.
 - f. Manuals that consist of multiple volumes should be submitted as individual files.
 - g. Manuals comprised of several sections or chapters should be bookmarked by the vendor.
 - h. If a vendor wished to include security settings (so that their documents are “read-only”), that is acceptable provided that Tacoma Power can view and print from the file.
3. All Guarantees and/or Agreements
- a. All guarantees, warranties, and/or agreements for such equipment and materials as carry such guarantees.

All surfaces disturbed shall be restored to a condition equal to that before the work began.

Surplus conduit material, tools, temporary structures, dirt and rubbish shall be removed and disposed of by the contractor, and the project area shall be left clean to the satisfaction of the engineer.

Clean up is considered incidental to the project and no measurement and payment will be allowed.

Obtain final inspections from authorities having jurisdiction.

END OF SECTION

SECTION 01750 - LEAD AND OTHER HAZARDOUS MATERIAL REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

The work in this section shall include all work that will require disturbance and/or complete removal of lead-bearing or other hazardous materials.

- A. This section is to establish and implement procedures and practices to be used for the removal and disposal of lead based coatings and other hazardous materials.
 - 1. All hazardous waste removal, handling, and disposal shall follow WAC 173-303.
- B. If the contractor suspects lead or other hazardous material work shall stop until the City can perform an analysis with the aid of a consultant of areas.
 - 1. The cost of removal, storage, and disposal of the lead or other hazardous material coatings shall be paid for by the City.

PART 2 EXECUTION

2.1 GENERAL

- A. All lead and hazardous waste removal work shall be performed by workers that have completed training and are knowledgeable in the removal of lead and hazardous waste materials.
- B. All requirements of the county departments of health shall be followed at all times.

END OF SECTION

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

SECTION 23 05 00 – GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing, and operation of mechanical work. This section applies to all Division 23 sections.
- B. General Requirements: General Conditions, Supplementary Conditions, and Division 01 sections apply to the Work in this section.

1.2 CODES AND STANDARDS

- A. Perform work in accordance with requirements in the state in which the work is performed.
 - B. Conform to applicable industry standards, such as UL and ETL standards, ANSI standards, and other standards as noted.
1. Notify the A/E of deviations in the Contract Documents to applicable codes and ordinances prior to installation of the Work. Perform changes in the Work after initial installation due to requirements of code enforcing agencies at no additional cost to the Owner.
 2. If conflict occurs between legally adopted codes and the Contract Documents, the codes prevail, except that this shall not be construed as relieving the Contractor from complying with requirements of the Contract Documents which may exceed code requirements and not contrary to same.
 3. Arrange for and pay for required permits, fees, and inspections.

1.3 SUBMITTALS

- A. Comply with requirements in Division 01 (Section 01025, 1.3) and with additional requirements indicated in this article.

B. ELECTRONIC PRODUCT DATA

1. Comply with requirements in Section 23 08 20 and additional requirements indicated in this article.
2. Submit each specification section complete at one time with a dedicated submittal number for each section. For example, submit products for Section 23 34 00 under one submittal number and products for Section 23 09 00 under a different submittal number. Submitting multiple sections at one time acceptable as long as each section has a dedicated submittal number. Include submittal number and date submitted in file name.
3. Partial Product Data submittals for a specification section not acceptable and will be returned without review:
 - a. Sections 23 31 00 and 23 34 00 including products and materials for first submittal and the Shop Drawings for second submittal.

- b. Section 23 09 00 including products and materials for first submittal and the Shop Drawings for second submittal.
 - c. Section 23 05 50 including products and the Shop Drawings that are contingent upon approval of specified products.
 - d. Long lead items.
4. Clearly mark catalog pages, equipment, and model number to be used. Indicate associated specification section and paragraph number on each page. Identify required options and accessories.
 5. Format
 - a. Adobe PDF file format.
 - b. Bookmark each submittal to facilitate browsing to each specification paragraph number.
 - c. Include table of contents for each specification section. Include catalog numbers or drawing numbers.
 - d. Include the Contractor and manufacturer's representative contact information for each product. Include job name (or abbreviation of job name), specification number, and contractor submittal number in file name.

C. SHOP DRAWINGS

1. Submit 3D shop drawings for systems specified in Division 23.
2. Submit prior to starting fabrication and installation work. Do not fabricate or install until reviewed by the A/E. Include complete location dimensions, hanger and support sizes and dimensions.
3. Complete drawings in timely manner and coordinate with construction schedule.
4. "Typical" drawings and wiring diagrams not acceptable unless they specifically apply to this project.
5. Show required coordination with work of other trades including electrical conduits, cable trays, structure, lighting fixtures and other items to be installed in ceilings, full height walls, and other items necessary to coordinate installation.
6. Floor plan backgrounds are available in electronic format and shall be requested from the A/E.
7. Direct use of the Drawings as the basis of the Contractor's prepared Shop Drawings not acceptable.
8. HVAC and controls subcontractors shall include in their bids attendance at coordination meetings on site to coordinate their work utilizing visual representation of 3D model.
9. Format
 - a. 3D drawings using industry recognized software for systems and areas of the building.
 - b. Minimum scale 1/4 inch per foot on same size sheets as the Drawings.
 - c. Adobe PDF file format.
10. Content
 - a. Airside HVAC: Complete duct installation consisting of detailed sheet metal drawings. Show ducts, duct fittings, turning vanes, air devices, flexible ducts,

volume dampers, motorized dampers, backdraft dampers, hangers, supports, seismic bracing, vibration isolators, equipment and other HVAC components included in the Contract Documents. Indicate sizes of ductwork, installed ductwork bottom of duct (BOD) above finished floor, equipment dimensions, dimensioned location of equipment and height above finished floor, air device tags indicating same information included on the Drawings, and equipment tags.

- b. HVAC controls: Complete controls installation consisting of detailed controls drawings. Comply with requirements in Section 23 09 00.
- D. Approval: Approval of manufacturer's name or Product by the A/E does not relieve the Contractor of responsibility for providing materials and equipment which comply in detail with requirements of the Contract Documents.
- E. Re-Submittals: Clearly identify re-submittals. Provide revised tabs, indexes, page renumbering, and other formats to interface with original submittal. Identify changes and include date for project tracking.
- F. Test Reports and Certificates: Submit as package prior to Substantial Completion.
- G. Testing and Balancing Reports: Submit as indicated in Section 23 05 93.
- H. Certifications: Submit written certifications from governing building authorities stating that the Work has been inspected and accepted, and complies with applicable codes and ordinances.
- I. Record Drawings: Comply with Article "Record Drawings" in this section.
- J. Commissioning: Submit equipment start-up and test procedures and preliminary Operations and Maintenance Manuals to the A/E as specified in Section 23 08 20. Submit under separate bound cover.

1.4 SCHEDULE OF VALUES

- A. Comply with requirements in Division 01 (Section 01025, 1.3) with additional requirements as indicated in this article.

1.5 DEFINITIONS AND ABBREVIATIONS

- A. Refer to Division 01 sections for definitions and abbreviations. Additional definitions and abbreviations are as follows.
- B. "Approved" or "Approval" means written approval by the City or "City's agent" (A/E).
- C. "Codes" means the AHJ adopted codes, rules, and ordinances and additional codes as specified herein.
- D. "Concealed and Concealed Work" means Work installed in spaces out of sight. For example, above ceilings, below floors, between double walls, within furred-in areas, within pipe and duct shafts, behind cabinets, and similar locations and spaces not exposed to view.
- E. The word "Contractor", as used in Division 23 sections, means HVAC or Control subcontractor.
- F. "Coordination", "Coordinating", and "Coordinate" mean to bring, or bringing, into common action, movement, or combination so as to act together in smooth concerted way.
- G. "Directed", "Requested", "Accepted", and similar terms mean these terms imply "by the A/E" unless otherwise indicated.

- H. "Exposed" means open to view of occupants in normally occupied areas. Work installed in mechanical, electrical, and equipment rooms is defined as exposed. Likewise for Work installed within accessible air distribution plenums, pipes installed in tunnels, and pipes installed in a room not covered by other construction.
- I. "Furnish" means supply and deliver to Project site ready for unloading, unpacking, assembly, installation, and similar activities.
- J. "Indicated" and "Indicated on the Drawings" means shown on the Drawings by notes, graphics or schedules, or written into other portions of the Contract Documents. Terms such as "shown", "noted", "scheduled" and "specified" have same meaning as "indicated", and are used to assist reader in locating particular information.
- K. "Install" means to place in position for service or use. Includes operations at Project site, such as unloading, unpacking, assembly, erection, placing, preserving, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar activities.
- L. "Mechanical Rooms" mean such spaces as mechanical rooms, accessible mechanical attics, mechanical mezzanines, boiler rooms, and other type of rooms and spaces that house mechanical and plumbing equipment. This definition applies to multiple specification sections and as noted as room names on the Drawings.
- M. "Provide" means furnish and install for complete, finished, and operable system and ready for intended use.
- N. "Shop Drawings" means documents which fully detail equipment and intended installation relative to this specific Project.
- O. "Substantial Completion" shall mean that entire project (or readily definable portion thereof if so designated in the Contract Documents) is acceptable to code enforcement authorities and to extent required by such authorities, has been inspected and approved by such authorities, and is suitable for occupancy by the Owner or occupant for purpose intended. Refer to Divisions 00 and 01 sections for additional requirements.
- P. "Work" or "Project" means entire scope of work required by the Contract Documents.
- Q. Abbreviations

A/E	Engineer
AHJ	Authorities Having Jurisdiction
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating & Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
C	Degrees Celsius
CISPI	Cast Iron Soil Pipe Institute
CSA	Canadian Standards Association
ETL	Environmental Technology Laboratory
F	Degrees Fahrenheit
FM	Factory Mutual
FOIC	Furnished by Owner Installed by Contractor
HVAC	Heating, Ventilating, and Air Conditioning
IAPMO	International Association of Plumbing and Mechanical Officials

IBC	International Building Code
IFC	International Fire Code
IFGC	International Fuel Gas Code
IMC	International Mechanical Code
IPC	International Plumbing Code
LEED	Leadership in Energy and Environmental Design
MERV	Minimum Efficiency Reporting Value
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.
NEC	National Electrical Code, NFPA 70 (latest adopted edition with Amendments)
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NSPC	National Standard Plumbing Code
OSHA	Occupational Safety and Health Administration
PSI	Pounds per square inch
PSIG	Pounds per square inch gage pressure
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association, Inc.
UL	Underwriters Laboratories Inc.
UPC	Uniform Plumbing Code
V	Volts
WOG	Water Oil Gas
WSP	Working Steam Pressure

1.6 MATERIALS

- A. Where two or more manufacturers are listed, select for use any of those listed. The first mentioned, in general, was used as basis of design. Bids on any manufacturer named acceptable as long as that manufacturer meets every aspect of the Contract Documents. Where several manufacturers are specified by name for one use, select for use any of those specified. Note that equipment layout is based on equipment listed in equipment schedules.
- B. Ensure that equipment will fit within available space. Where other than basis of design manufacturer is selected for the Project, the Contractor is responsible for verifying equipment will fit within available space and meet manufacturer's and code required clearances.
- C. Where other than basis of design manufacturer is selected for the Project, include cost of resulting additional work, coordination with other trades, and redesign of associated building services and structure as required to accommodate selected equipment. Include redesign drawings with submitted Shop Drawings.

1.7 STANDARDS OF QUALITY

- A. Equipment shall be manufacturer's regularly catalogued items and shall be supplied as complete unit in accordance with manufacturer's standard specifications and any optional items required for proper installation for equipment unless otherwise noted. Install equipment and materials in accordance with manufacturer's recommendations and best trade practices.
- B. Furnish products of single manufacturer for items which are used in quantity. A Product, for purpose of this paragraph, is assembly of components such as fans, air handling units, chillers, valves, and similar items. Materials such as pipe, fittings, pipe and duct insulation, and similar items not requiring maintenance are not included in single manufacturer requirement of this paragraph.

- C. Products shall be new unless indicated otherwise in the Contract Documents.

1.8 SUBSTITUTIONS

- A. Comply with requirements in Division 01 (Section 01300, 1.4) "Or Equal Clause or Substitutions) with additional requirements indicated in this article.
- B. Substitutions will be considered following bid award only when a product becomes unavailable through no fault of the Contractor.
- C. Where "manufacturer" paragraphs include the words "or approved", prior approval of the proposed substitution is required. The A/E is sole judge of quality of proposed substitution.
- D. When the A/E approves a substitution request, approval is given with understanding that the Bidder:
 - 1. Has investigated proposed Product and determined that it meets or exceeds quality level of specified Product.
 - 2. Will provide same warranty for substitution as for specified Product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to the City.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
- E. Whenever a Product is described by detail, specification, trade name, manufacturer's name or catalog reference, use only such Product. There are no prior approvals for this project.
- F. Provide as specified certain products, materials, and systems where "manufacturer" paragraphs are followed by the words "No substitutions".
- G. Substitutions will not be considered when they are indicated or implied on the Shop Drawings or product data submittals, without separate written prior approval, or when approval will require revision to the Contract Documents.

1.9 DRAWINGS AND SPECIFICATIONS

- A. General: Mechanical drawings are diagrammatic. Complete details of building features which affect HVAC installations may not be shown. For additional details, refer to other Contract Documents. Report any discrepancies to the A/E along with suggested revisions. Obtain written response from the A/E before proceeding with changes.
- B. Depiction of the Work: The Drawings do not show exact characteristics of the Work, piping and air distributions configurations, or necessary number of fittings and offsets. Base work on actual field measurements and conditions. Provide work required to complete installation.
- C. Dimensions: Do not scale drawings. Dimensional accuracy is not guaranteed, and field verification of dimensions, locations, and levels to suit field conditions is required.
- D. Discrepancies: Field verify dimensions and existing conditions prior to performing the Work. Bring to the A/E's attention any discrepancies within the Contract Documents and between the Contract Documents and field conditions. Also for any design and layout changes required due to specific equipment selection, prior to the Contractor's work (equipment and material purchasing and installation). Any

corrective work required by the Contractor after his discovery of such discrepancies, inconsistencies, or ambiguities shall be performed at no additional cost to the Owner.

- E. Specifications: These specifications are written in imperative mood and streamlined form. Imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

1.10 RECORD DRAWINGS

- A. Comply with requirements in Division 01, with additional requirements indicated in this article.
- B. Prepare Record Drawings. Record Drawings shall be new black line prints (pencil and black pen not acceptable) and shall show measured locations of portions of the Work and changes the Contractor has made.
- C. Record corrections and changes made during progress of the Work, showing work as actually installed. In general, acceptable tolerance plus or minus 1’-0” from actual location in horizontal plane. Indicate exact installed invert elevations for underground piping. Neatly hand-draft on daily basis. Keep readily available at project site. Use latest revisions and keep neat and clean. Do not use the Contractor’s working drawings.
- D. Record Drawings are subject to review by the A/E on regular basis throughout construction. At end of construction, check drawings for completeness and accuracy.
- E. Drawings shall show addendum items, change orders, clarifications, supplemental instructions, and deviations from the Drawings.
- F. Per project closeout procedures, submit in AutoCAD format along with corrected black line drawings. Each sheet shall be noted as “RECORD DRAWING”.

1.11 COORDINATION

- A. Coordinate Division 23 Work with other trades.
- B. Be aware of restricted space for installation of HVAC systems. Include offsets and perform rerouting and coordination to fit elements in available space. Include provisions for such requirements in bid.
- C. Equipment and ductwork shown are based on existing drawings as available and on limited project site observations to extent possible under current conditions. Field verify existing conditions prior to commencement of Work. Obtain specific locations of structural and architectural features or equipment items from referenced drawings, field measurements, or trade providing material or equipment.
- D. Coordinate ductwork installations to clear light fixtures and electrical cable trays. Include clearance over light fixtures to allow removal and replacement. Include minimum 6 inch clearance above and to sides of cable trays. Coordinate routing of ductwork and piping with each other and other trades so grade of piping can be accomplished and fit in available space.
- E. Coordinate clearance requirements with duct insulation applications, and equipment installation for equipment insulation applications. Before preparing piping and duct Shop Drawings, establish and maintain clearance requirements for insulation applications and field-installed insulation jackets and finishes and for space required for maintenance.

- F. Do not install ductwork over electrical panels and where clearance is required by code and for maintenance.
- G. Coordinate attachments to structure to verify that attachment points on equipment and structure can accept seismic, weight, and other loads imposed.

1.12 WORKMANSHIP

- A. Work shall be in accordance with best trade practices. Remove substandard workmanship and provide new material at no additional cost to the City.

1.13 SITE VISIT

- A. The Contractor shall visit site during bidding period to note conditions affecting installation of the Work. No additional charges allowed due to failure to adequately review conditions.
- B. Investigate each space through which equipment must be moved. Where necessary, arrange with equipment manufacturers to ship equipment in sections with suitable dimensions for moving through restricted spaces. For movement through occupied spaces, ascertain from the Owner as acceptable times of day or night that movement could occur. Include costs in the Bid for off hours labor, reassembly, and field testing.

1.14 CERTIFICATION

- A. By submitting a Bid for HVAC systems, the Contractor and his subcontractors acknowledge and certify the following:
 - 1. That they have carefully examined and fully understand the Drawings and Specifications including but not limited to architectural, site, utility, mechanical, structural, and electrical drawings, and their specifications. In addition, they have determined that the Drawings and Specifications are adequate to complete HVAC systems and that they can provide complete finished and operable system in accordance with the Contract Documents.
 - 2. That they have had reasonable opportunity to discover any ambiguities in the Contract Documents and such ambiguities have been brought to attention of the A/E in writing prior to submitting the Bid.
 - 3. That they have reviewed project progress schedule with general contractor, fully understand schedule, and they have verified, prior to submitting a Bid, availability of necessary labor and materials, including supervision and office backup, and can comply with schedule requirements.
 - 4. That there may be changes to scope of work and that they understand that any proposal submitted for performance of additional work shall include costs associated with such change including but not limited to labor, materials, subcontracts, equipment, taxes, fees, schedule impact, loss of efficiency, supervision, overhead, and profit.
 - 5. That the Contract requires them to coordinate their work with that of other trades and that responsibility for coordination includes rerouting, offsets, and similar provisions, to fit the Work and address manufacturer's recommended clearances for service access, maintenance, and replacement of equipment in manner that is compatible with the Work of other trades in same area.
 - 6. That routing of elements of HVAC systems shown on the Drawings is schematic only and that offsets and rerouting will be required in installation and that labor and materials for offsets and rerouting have been included for such in their bids.
 - 7. That they understand submittals of material and equipment to the A/E is for the purpose of establishing what they are providing for the Project. Any review undertaken by the A/E does not relieve them of their responsibilities to furnish and install materials and

equipment required for the Work in the Project nor does such review relieve them of their responsibilities for coordination with other trades and designers to ensure that such materials and equipment will fit and be suitable for purpose intended.

8. That they agree to receive payment for bid amounts as full compensation for furnishing materials and labor which may be required in prosecution and completion of the Work required under the Contract Documents, and in respects to complete the contract work to satisfaction of the A/E.
9. That they include in their bids costs to furnish bonds as specified in the Contract Documents.

1.15 WARRANTY

- A. Conform to requirements in General Conditions, Supplementary Conditions, and Division 01. Where not so prescribed or defined, the period shall be one (1) year. Warranty periods within Division 23 shall not commence until Substantial Completion date. Contractor shall extend longer warranties specified in other sections.

1.16 DEMONSTRATION

- A. Comply with requirements in Division 01 with additional requirements indicated in this article.
- B. Following installation of HVAC work and prior to final acceptance, demonstrate that equipment and systems operate as indicated in the Contract Documents and in accordance with manufacturer's recommendations.
- C. Perform in presence of the A/E and the Owner's representative, unless otherwise directed by the A/E. Give minimum one (1) week notice prior to demonstrations.
- D. Provide instruments and personnel required to conduct demonstrations.

1.17 SUBSTANTIAL COMPLETION

- A. Comply with requirements in Divisions 00 and 01.
- B. Prepare list of items that are not complete prior to asking for the Substantial Completion review by the A/E.
- C. Review of the Work: The A/E's fee for mechanical work includes two (2) final construction observation reviews. First one is the Substantial Completion review of the Work and will be in response to the Contractor's notice of final completion of the Work. If necessary, second one is post-Substantial Completion review of the Work and will occur after notification by the Contractor that deficiencies noted during the Substantial Completion review have been corrected.
- D. Owner Occupancy:
 1. Perform the Work in existing building with respect for necessity of the City's employees to perform their regular work.
 2. Plan installation of new work and connections to existing work to assure minimum interference with regular operation of existing facilities. Do not remove, disconnect, or shutdown systems without prior review by the City to confirm that areas needed to remain in operation are not affected.
 3. Provide temporary ductwork, wiring, controls, and similar systems and connect to existing systems to keep existing HVAC systems in operation to service areas that need to remain occupied.

1.18 COMMISSIONING

- A. Comply with requirements in Sections 23 08 00.
- B. Equipment manufacturer's authorized representatives shall perform start-up and testing services as specified in Sections 23 08 00.
- C. Submit equipment start-up and test procedures and preliminary Operations and Maintenance Manuals to the A/E as specified in Section 23 08 20. Submit under separate bound cover.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 23 05 05 – PROJECT CLOSEOUT AND SYSTEM START-UP

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes material and labor required to perform start-up of equipment and systems installed in project, to perform checkout of systems, and to verify completeness of project requirements.
- B. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 and Sections 23 05 00, 23 05 10, and 23 05 93 apply to the Work in this section.
- C. Refer to requirements in Sections 23 08 00.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.

1.3 SUBMITTALS

- A. Comply with requirements in Division 01 and Section 23 05 00.
- B. Submit within six (6) weeks of award of Contract the following for review and approval by the engineer.
 - 1. Checklist for each piece of scheduled equipment indicating items that will be verified for proper operation and completeness of installation. Include an area for comments and completion date for correction of deficiencies. Use of the equipment manufacturer's standard start-up/checkout form is acceptable.
 - 2. Checklist of controls by system or piece of equipment indicating items that will be checked, sequences that will be checked, and completeness of the installation. Include an area for comments and completion date for correction of deficiencies.
 - 3. Checklists shall have a place at each item for the person doing checkout to initial item indicating task has been completed and date it was completed.
 - 4. Preliminary schedule indicating sequence of events involved with pre-functional check-out, equipment start-up, testing and balancing (TAB), TAB verification, and functional testing. Schedule shall indicate approximate time intervals required for completion of respective tasks.
 - 5. Prepare and submit a list of items that are not complete prior to requesting substantial completion review by the A/E.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 PROJECT CLOSEOUT PROCEDURES

- A. Complete the Work described in this section prior to time of Substantial Completion.
- B. Use pre-functional checklists prepared by Commissioning Authority to verify completeness of system installation and proper system operation. Submit completed checklists for review prior to Substantial Completion.

- C. Schedule pre-startup coordination meeting with the City, the Engineer, and the Commissioning Authority for the specific purpose of achieving a coordinated systems start-up.
- D. Representatives for the mechanical subcontractor, sheet metal subcontractor, temperature control subcontractor and TAB subcontractor shall be present at the pre-startup meeting and at the initial startup of each mechanical system.
- E. Mechanical subcontractor shall bear prime responsibility for startup of heating and cooling systems.
- F. If a piece of equipment is not performing satisfactorily during TAB, TAB subcontractor shall notify the installing subcontractor for corrective action.
- G. All subcontractors shall comply with the decision of the Construction Manager and the A/E of any conflict of responsibility.
- H. Include completed checklists in the Operation and Maintenance Manuals.
- I. Prepare draft of preliminary commissioning report (required by the Washington State Energy Code (WSEC)) for review by the A/E prior to the commissioning. Include documentation required by the WSEC, including, but not limited to, the documentation and description of deficiencies found during pre-functional check-out/start-up and functional testing, resolution of items that were resolved, and listing of items and testing that are not complete or will need to be deferred.

3.2 SYSTEM START-UP PROCEDURES

- A. As a minimum, the items listed in this article shall be completed. Include recommendations by manufacturers of systems and equipment.
- B. Inspect bearings for cleanliness and alignment and remove foreign materials found. Grease in accordance with manufacturer's recommendations. Replace bearings that run rough or noisy.
- C. Adjust ECM motors for required equipment speed. "Required equipment speed" is that speed which produces intended performance. Adjust fans and rotating equipment to maintain operation within the performance curve provided by manufacturer without over speeding equipment or causing excess vibration.
- D. Adjust direct drives for proper alignment of flexible couplings, lubricate particular couplings, check security of couplings to driver and driven shafts, and set drive components to ensure free rotation with no undesirable stresses on coupling and attached equipment.
- E. Remove rust, scale and foreign materials from equipment and renew any defaced surfaces. If equipment is badly marred, the A/E has authority to require new materials be provided.
- F. Install clean air filters. Refer to requirements in Section 23 41 00.
- G. Repair damaged insulation.
- H. After each system has been put into operation, repeat certain checks described in preceding paragraphs.
- I. Complete applicable start-up procedures described in preceding articles and paragraphs prior to Substantial Completion.
- J. Provide adjustment services as necessary to ensure proper functioning of systems after building occupancy and during warranty period.

3.3 SCHEDULE OF VALUES

- A. Include a line item in schedule of values for doing the project closeout and system start-up work. Value shall include the time for preparing initial checklists, for checking out project, and for starting up systems. Value shall accurately reflect amount of time and material Contractor estimates to spend on these tasks.

3.4 FINAL ACCEPTANCE

- A. Final acceptance of the Work will not occur until functional testing is complete and outstanding issues resolved.

END OF SECTION

SECTION 23 05 10 – BASIC MATERIAL AND METHODS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes equipment supports, sleeves, identification, appurtenances, and miscellaneous work. This section applies to all Division 23 sections.
- B. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 sections apply to the Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.
- B. UL Compliance: Where UL fire-resistance rating is indicated for construction penetrated by access units, furnish UL listed and labeled units, except for those units which are smaller than minimum size requiring ratings as recognized by governing authority.

C. CODES AND STANDARDS

- 1. ASME A13.1, Scheme for the Identification of Piping Systems for lettering size, colors and installed viewing angles of identification devices [unless other requirements are specified].
- 2. ASTM D 709, Standard Specifications for Laminated Thermosetting Materials.
- 3. ASTM D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
- 4. ASTM D 2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- 5. ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- 6. ASTM E 814, Standard Test Method for Fire Tests of Penetration Firestop Systems.
- 7. NFPA 255, Surface Burning Characteristics Building Materials.
- 8. UL 723, Standard for Test for Surface Burning Characteristics of Building Materials.
- 9. UL 1479, Standard for Fire Tests of Through-Penetration Firestops.

1.3 SUBMITTALS

- A. Comply with requirements in Division 01 and Section 23 05 00.
- B. Product Data: Submit manufacturer's technical product data and maintenance data for the following:
 - 1. Equipment supports
 - 2. Equipment nameplates
- C. Test Reports: As required in specific specification sections.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products in accordance with manufacturer's recommendations, using means and methods to prevent damage, deterioration, and loss, including theft.
- B. Deliver products to site in manufacturer's original containers, complete with labels.
- C. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- D. Store products subject to damage by weather conditions above ground, under cover in weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
- E. Close open ends of equipment and work with temporary covers or plugs during storage and construction to prevent entry of foreign material.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials shall be new and of manufacturers specified herein. They shall bear the UL, ETL or CSA labels where possible.

2.2 EQUIPMENT SUPPORTS

- A. Select and size supports, expansion shells and bolts, concrete inserts, and anchor bolts per requirements for seismic restraints specified in Section 23 05 50. Hot dipped or mechanically galvanized where installed outdoors unless noted otherwise on the Drawings. Damaged galvanized surfaces repaired with ZRC Worldwide Galvilite® Galvanizing Repair.

B. EXPANSION SHELLS AND BOLTS AND CONCRETE SCREWS

- 1. Manufacturers for Expansion Shells for Rod Hangers: Simpson Strong-Tie®, Hilti, or approved for holes drilled in concrete.
- 2. Manufacturers for Expansion Bolts for Equipment: Simpson Strong-Tie®, Hilti, or approved for holes drilled in concrete.
- 3. Manufacturers for Concrete Screws for Equipment: Simpson Strong-Tie®, Hilti, or approved for holes drilled in concrete.
- C. Formed Steel Channels: Twelve gage minimum, 1-5/8 inch by 1-5/8 inch minimum cross-section size, epoxy coated. Cooper B-Line Dura-Green™ or Dura-Copper™, Unistrut, POWER-STRUT®, or approved.
- D. Anchor Bolts: Include for equipment. Number and size per manufacturer's recommendations or as indicated on the Drawings.
- E. Supplementary Steel Framing: Standard structural steel shapes or Schedule 40 steel pipe.
- F. Welding to Building Structural Members: Not acceptable except as indicated on the Drawings.

2.3 EQUIPMENT NAMEPLATES

- A. General: Engraved stock melamine plastic laminate. Comply with ASTM D 709. Engraved with engraver's standard letter style of sizes and wording, black with white core (letter color) except as otherwise indicated, punched for mechanical fastening

except where adhesive mounting is necessary because of substrate. Plastic strips with raised letters made by a marking device not acceptable. Include area (room) served on nameplate. Coordinate naming convention with the Owner. Color of nameplates for access doors for fire dampers, smoke dampers, and combination fire/smoke dampers as selected by the AHJ.

- B. Thickness: 1/16 inch thick for nameplates up to twenty (20) square inch or eight (8) inch length and 1/8 inch thick for larger nameplates.

2.4 PERSONNEL PROTECTION

- A. General: Where support angles, hangers, equipment supports and appurtenances, and similar items are exposed above floors, walkways, and maintenance access ways, cover such protrusions less than six (6) feet-(6) inches above floor with protective padding.
- B. Protective Padding: Soft elastomeric foam material or equivalent with composite and component ratings per NFPA 255, ASTM E 84, or UL 723. Flame spread 25, smoke developed 50. Comply with requirements in Section 23 07 00 for elastomeric insulation.
- C. Finish: White field-applied finish of same manufacturer as protective padding.

PART 3 - EXECUTION

3.1 MEASUREMENTS

- A. Verify measurements at job site. Locate equipment and fixtures on centers of walls, openings, spaces, and similar locations except where noted otherwise. Check that, ducts, and similar elements clear openings.

3.2 INSTALLATION OF EQUIPMENT

A. EQUIPMENT INSTALLATION

- 1. General: Install supports for equipment and appurtenances.
- 2. Suspended Equipment:
 - a. Install hangers from structure
 - b. Span between structural members with additional structural steel to mount equipment in locations shown. Do not fasten hangers to metal deck. Powder actuated fasteners not acceptable.
- 3. Floor-Mounted Equipment, General
 - a. Install equipment at locations and to dimensions indicated in the drawings using manufacturer's leveling screws, blocks, shims, or wedges. Do not distort equipment or baseplates.
- 4. Stands: Fabricate structural steel stands to support equipment not floor mounted or suspended from structure. Fabricate from structural steel members or steel pipe and fittings.
- B. Equipment Seismic Restraints: Comply with requirements in Section 23 05 48.

3.3 CUTTING AND PATCHING

- A. General: Include in cost of HVAC work, cutting, coring, patching, and painting of existing walls, ceilings, and floors as required to accommodate work as indicated in the Contract Documents and specified in Division 23 work. Employ skilled workmen to perform cutting and patching and restore disturbed surfaces to original condition.

Material and workmanship for patching shall be as specified in respective sections for general construction. If not specified, patch and paint to match existing surfaces. In addition, comply with requirements in Division 01.

- B. During demolition efforts, cover duct open-ends and grille openings with taped on plastic sheet to keep construction dust out of the ducted system. Comply with requirements of Section 23 05 20.

3.4 ACCESSIBILITY

- A. General: Locate dampers, controls, and similar components to be readily accessible. Install access doors to achieve accessibility. Access shall include, but not limited to, HVAC equipment above inaccessible ceilings.
- B. Equipment:
 - 1. Install equipment which requires periodic servicing or repairs to be readily accessible.
 - 2. Ducts, and conduit shall not interfere with required access.

3.5 PERSONNEL PROTECTION

- A. General: Secure and permanently fasten elastomeric foam material in neat and smooth manner using band straps, clamps, snaps, or similar methods.

3.6 EQUIPMENT NAMEPLATES

- A. Install nameplates on or near each major item of mechanical equipment and each operational device. Install on accessible sides of equipment for the following general categories of equipment, operational devices, and for equipment scheduled on the Drawings:
 - 1. Fans – label each fan to match labeled control panel
 - 2. Control panels – label control panel to match fan location.
- B. Install with self-tapping stainless steel screws or steel rivets, except use of contact-type permanent adhesive where screws cannot or should not penetrate substrate is acceptable.

3.7 PAINTING

- A. Touch-up: Cover scratches, abrasions, and similar damages to equipment with factory finished surfaces using matching factory furnished paint.

3.8 REVISIONS, ALTERATIONS, AND CONNECTIONS TO EXISTING MECHANICAL SYSTEMS

- A. General: Concealed equipment and ducts of record are indicated in the Contract Documents. Since these are not necessarily exact with respect to location or completeness, take the following steps:
 - 1. Inspect existing conditions of work, including existing equipment and ducts, and compare to the Contract Documents for extent and description of new work.
 - 2. Where connections are required to existing ducts, keep shutdown period to a minimum and restore services promptly to existing building.
 - 3. Should any unknown ducts be encountered during course of work, notify the A/E of such discovery.

3.9 CLEANING AND HOUSEKEEPING

- A. General: Comply with requirements in Division 01 and Section 23 34 00 for air handling equipment.
- B. Remove debris, cuttings, crates, cartons, and similar items, created by Divisions 23 Work at regular intervals. Perform at sufficient frequency to eliminate hazard to the public, other trades personnel, building, and the Owner's employees.
- C. Before Substantial Completion, carefully clean equipment, fixtures, exposed ducts and piping, and similar items. Remove construction labels, dirt, dust, cuttings, paint, plaster, mortar, concrete, and similar items.

3.10 COMMISSIONING

- A. Equipment and systems referenced in this section shall be commissioned per Section 23 08 00. The Contractor has specific responsibilities for scheduling, coordination, test development, testing and documentation.

END OF SECTION

SECTION 23 05 13 – ELECTRICAL PROVISIONS FOR MECHANICAL WORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes factory and field installed motors, factory and field installed motor starters, and associated appurtenances.
- B. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 sections apply to the Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county and state codes and ordinances.
- B. Codes and Standards:
 - 1. IEEE 112, IEEE Standard Test Procedure for Polyphase Induction Motors and Generators.
 - 2. NEMA MG 1, Motors and Generators.
 - 3. NFPA 70, National Electrical Code (NEC).
 - 4. UL 98, Enclosed and Dead-Front Switches.
 - 5. UL 489, Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures.
 - 6. UL 508, Industrial Control Equipment.
 - 7. UL 508A, Industrial Control Panels.
 - 8. UL 1995, Heating and Cooling Equipment.
- C. Comply with applicable NEMA standards and refer to NEMA standards for definitions of terminology herein. Comply with NFPA 70 for workmanship and installation requirements and to applicable Division 26 sections.

1.3 SUBMITTALS

- A. Comply with requirements in Division 01 and Section 23 05 00.
- B. Shop Drawings: Wiring diagrams for each type and size of field installed motor starter and Fan-Wall controller.

1.4 WARRANTY

- A. Warrant motors for two (2) years after Substantial Completion date. Warranty shall cover material, labor, and travel time. Make available replacement within forty eight (48) hours of initial notification.

PART 2 - PRODUCTS

2.1 EQUIPMENT SHORT CIRCUITING CURRENT RATING

- A. Mechanical equipment, packaged systems, control panels, motor starters, motor controllers, variable frequency drives and similar equipment shall carry a Short Circuit Current Rating (SCCR) equal to or greater than available fault current

delivered from electrical system. Include visible factory nameplate for such equipment indicating SCCR of equipment in accordance with UL 1995 and UL 508A.

PART 3 - EXECUTION

3.1 EQUIPMENT AND MOTOR CONNECTIONS

- A. Install flexible-conduit connection to motor and equipment for packaged and non-packaged equipment that is factory assembled. Comply with applicable provisions of Division 26 sections for wiring materials and wiring services.
- B. Refer to Division 26 sections for installation requirements. Division 23 shall provide work not indicated in Division 26 for a complete and operating system. Where a conflict occurs between Division 23 and Division 26, Division 23 Contractor shall provide work for a complete and operating system. Refer to schedule included in this section for additional information.

3.2 EQUIPMENT FABRICATION

- A. Fabricate mechanical equipment for secure mounting of motors and other electrical items including in work. Include permanent alignment of motors with equipment, or adjustable mountings as applicable for belt drives, gear drives, special couplings and similar indirect coupling of equipment. Install safe, secure, durable, and removable guards for motor drives, arranged for lubrication and similar running maintenance without removal of guards.

3.3 COMMISSIONING

- A. Equipment and systems referenced in this section shall be commissioned per Section 23 08 00. The Contractor has specific responsibilities for scheduling, coordination, test development, testing and documentation.

3.4 MECHANICAL – ELECTRICAL INTERFACE SCHEDULE

- A. Establishing the separation of work between trades and subcontractors is not within scope of these Contract Documents. The following schedule is proposed for assistance in bidding only.
- B. Unless otherwise indicated in the Contract Documents, mechanical equipment and controls are suggested to be furnished, installed, and wired in accordance with the following schedule. Coordinate work with Division 26 sections.

ITEM	FURNISHED BY	INSTALLED BY	POWER WIRING BY	CONTROL WIRING BY
1. Equipment Motors:	M	M	E	M
2. Magnetic Motor Starters and Equipment Connections: a. Furnished with Mechanical Equipment, Field Mounted:	M	M	E	M
3. Section 230900 Automatic Temperature Controls: Switches, other Miscellaneous Controls:	M	M	M	M
4. Disconnect Switches and 120 V Receptacles per IMC and NEC:	E	E	E	----

5. Relays and Ancillary Devices Associated with HVAC Unit Manual Motor Starters, Thermal Overload Switches:	M	E	E	M
6. Section 230900 Control Panels:	M	M	E	M

M = Division 22 and 23, Mechanical
E = Division 26, 27 and 28, Electrical

END OF SECTION

SECTION 23 05 20 – MECHANICAL DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes selective demolition of existing HVAC work as indicated in the Contract Documents.
- B. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 sections apply to the Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 GENERAL

- A. Dust Control: Provide protective measures to minimize transfer of noise, dust, dirt, and refuse to adjacent areas of building. Such measure may include dust-tight barriers, temporary walls, portable exhaust fans, vacuum systems, and temporary partitioning.
- B. Extent: Keep areas of demolition as clean and orderly as physically possible. Do not allow demolition debris to accumulate. Gather debris and dispose daily. Broom or vacuum-clean work areas on daily basis.
- C. Protection: Protect existing equipment, furnishing, and systems with protective coverings. Protect finished surfaces including floors, ceilings, and walls.

3.2 DAMAGES

- A. Repairs: Promptly repair damage to existing surfaces, equipment, finishes, or adjacent facilities at no cost to the Owner and to the satisfaction of the A/E and the Owner.

3.3 CONTINUITY OF EXISTING UTILITY SERVICES

- A. Comply with requirements in Section 23 05 00.

3.4 DEMOLITION

- A. General: Provide demolition work required in existing building for removal of existing HVAC equipment, ductwork, and controls and for installation of new equipment, ductwork, and controls. Relocate and modify existing equipment, controls, and ductwork as required by general construction alterations and by installation of new equipment, ductwork and controls in existing building to achieve a complete and functioning installation.
- B. Extent: Remove and dispose of existing materials indicated on the Drawings to be removed.
- C. Termination of Demolition: Where existing ductwork is removed, cut back to stack or riser.

- D. Insulation: Replace damaged sections as specified for new systems where existing insulation is damaged due to cutting and connection to new systems.
- E. Reuse: Do not reuse existing products unless indicated on the Drawings.
- F. Materials to the Contractor: Materials other than those reserved by the City.
- G. Existing Conditions: Comply with requirements in Division 01. Verify specific demolition work and operating conditions to be encountered from on-site review and coordination with the Owner. Maintain service to existing equipment and devices during new construction work as required by construction sequencing/scheduling provisions. In areas adjacent to new construction work, provide temporary services as necessary to meet these conditions. Protect active piping and wiring encountered. Notify the A/E of utilities encountered whose services are not known.
- H. Drilling of Concrete: Drill openings through existing concrete with diamond tipped rotary core-drilling equipment or carbide tipped drills.
- I. Coating or Welding Material: Prior to any cutting with saw blades, plasma torch, oxy/acetylene torch, or welding within the building or other type of equipment that produces smoke or fire shall be coordinated with the City to deactivate fire alarm, smoke detectors and other alarms for smoke control.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. Disposal: Remove debris, rubbish, and other materials resulting from demolition operations from building site unless reinstalled or delivered to the Owner as indicated in the Contract Documents. Transport and legally dispose of material off site.
- B. Burning: Burning of removed materials is not permitted on project site.

3.6 CLEAN-UP AND REPAIR

- A. Clean-Up: Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protection and leave interior areas clean.
- B. Repair: Repair demolition performed in excess of that required at no additional cost to City. Return structures and surfaces to conditions existing prior to commencement of demolition work or as directed by the City.

END OF SECTION

SECTION 23 05 50 – SEISMIC CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes seismic restraints for mechanical equipment and distribution systems
- B. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 sections apply to the Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.
- B. Codes and Standards:
 - 1. ASCE 7, Minimum Design Loads For Buildings and other Structures.

1.3 SUBMITTALS

- A. Comply with requirements in Division 01 and Section 23 05 00.
- B. Product Data: Submit manufacturer's technical product data for the following:
 - 1. Seismic restraints
 - 2. Miscellaneous supports

C. SHOP DRAWINGS

- 1. Seismic restraint installations, including calculations.
- 2. Shop Drawings shall be stamped and signed by a professional engineer licensed in engineering in the state in which the Work is performed.
- D. Calculations: Sizing and weight distribution for seismic restraints. Calculations shall be stamped and signed by a professional engineer licensed in engineering in the state in which the Work is performed.
- E. Seismically Certified Equipment: Submit testing installation details.
- F. Seismic Restraint Details: Detail fabrication and attachment of seismic restraints. Include the following:
 - 1. Anchorage details and indicate quantity, diameter, and depth of penetration of anchors.
 - 2. Overturning force calculations and other design calculations.
 - 3. Seismic brace layouts indicating locations of seismic bracing.
 - 4. Details for seismic restraints and attachment to structure.
 - 5. Additional design information as required by IBC and ASCE 7.
- G. Procedures: Submit procedures and installation instructions for setting and adjusting seismic restraints.
- H. Final Inspection Report: Seismic restraint manufacturer shall prepare and submit written report documenting final inspection and certifying that seismic restraints are properly installed and adjusted.

1.4 CONTRACTOR RESPONSIBILITY FOR SEISMIC RESTRAINTS

- A. General: A single supplier shall furnish seismic restraints, sway braces, and related hardware for the project unless otherwise specified.
- B. Responsibility: This supplier shall be responsible for selection and installation supervision of seismic restraints. Prepare engineering drawings and details and submit to the A/E. Perform installation supervision and provide adjustment instructions.

C. SEISMIC RESTRAINTS

- 1. All manufactured restraint devices for ducts and equipment shall meet seismic requirements in IBC and ASCE 7.
- 2. All required structural engineering will be by the City unless noted otherwise. The Contractor shall notify the Engineer, in advance with shop drawings of areas requiring structural analysis. The City will provide necessary calculations, stamped and signed by a professional Engineer licensed in the State of Washington.

1.5 SEISMIC RESTRAINTS, GENERAL

A. DESCRIPTION

- 1. Seismic restraint of equipment as indicated in the Contract Documents and as listed in Article "Seismic Restraint Schedule" in this section.
- 2. Seismic restraint of piping and ducts as indicated in the Contract Documents and listed in Article "Seismic Restraint Schedule" in this section.
- 3. Provide components or materials not specifically mentioned herein, but necessary for proper seismic control of equipment.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Manufacturers: Mason Industries, Inc., Amber/Booth, Kinetics Noise Control, Vibration Mountings and Controls, Vibro-Acoustics®, Korfund Dynamics Corporation, California Dynamics Corp (CalDyn), TOLCO™, or approved. Mason Industries model numbers are listed.

2.2 MISCELLANEOUS SUPPORTS

- A. Type WB-1, Neoprene Washers and Bushings:
 - 1. Washer-bushing manufactured of bridge bearing neoprene.
 - 2. Washer-bushing maximum loading not to exceed 1000 psi.
 - 3. Washer-bushing to be used such that direct contact between bolt and equipment is eliminated.
 - 4. Manufacturer and Model: Mason Industries HG.

2.3 SEISMIC RESTRAINTS

A. GENERAL

- 1. Restraints capable of safely accepting external forces as defined in IBC and applicable state and local codes without failure to maintain mechanical equipment, piping, and duct in captive position.
- 2. Seismic devices not to interfere with vibration isolators during normal operation.

3. Seismic mounts shall have State of California OPA number verifying maximum certified horizontal and vertical load ratings.

B. SEISMIC RESTRAINT E-1

1. Description: Interlocking steel members restrained by shock absorbent rubber materials compounded to bridge-bearing specifications.
2. Construction
 - a. Elastomeric materials replaceable, minimum 1/4 inch thick molded bushing.
 - b. Air gap between hard and resilient material of not less than 1/8 inch, nor more than 1/4 inch.
3. Application: Locate and size snubbers to suit application. Furnish sufficient quantity such that restraint load rating will not be exceeded. Minimum of four (4) snubbers required.
4. Manufacturer and Model: Mason Industries Z-1225 or Z-1011.

C. SEISMIC RESTRAINT E-2:

1. Description: Pre-stretched galvanized steel cable assembly with swivel end connections using two (2) clamping bolts. Vertical rods at seismic brace locations braced with and rod clamp assembly to accept compressive loads.
2. Application: Cables sized to accommodate loads with minimum safety factor of 2.
3. Manufacturer and Model: Mason Industries SCB with SSB rod clamp assembly.

2.4 FACTORY FINISHES

- A. Apply manufacturer's standard paint to factory-assembled and tested equipment before shipping.
 1. Mechanically galvanized hardware. Hot dipped galvanize metal components where installed outdoors.
 2. Baked enamel for metal components where installed indoors.

PART 3 - EXECUTION

3.1 INSPECTION

- B. Description: Verify installation conditions as satisfactory to receive the Work of this section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 PREPARATION

- A. Field Measurements: Field verify locations of new and existing work prior to commencing the Work of this section.
- B. Protection: Protect surrounding areas and surfaces to preclude damage from the Work of this section.

3.3 INSTALLATION, APPLICATION, ERECTION, AND PERFORMANCE

- A. Description: Install, apply, erect, and perform the Work in accordance with Article "Quality Assurance" provisions, specifications, and manufacturer's installation instructions and directions. Where these may be in conflict, the more stringent requirements govern.

- B. Assistance: Seismic restraint supplier shall provide assistance to Contractor to ensure correct installation and adjustment of seismic restraints.

3.4 EQUIPMENT AND DUCT SEISMIC RESTRAINTS

- A. General: Comply with requirements in IBC and ASCE 7 unless otherwise indicated in the Contract Documents.
- B. Coordination: Coordinate with submittals and Shop Drawings of mechanical equipment such as fans, and similar items. Coordinate with general contractor and structural engineer to ensure correct mounting attachment points.

C VIBRATION-ISOLATED EQUIPMENT AND DUCTS

- 1. Install seismic restraints with factory set clearances. Install seismic restraint to avoid short circuiting of vibration isolators.
- 2. Isolate bolts from direct contact with structure with Type WB-1 isolators.

3.5 COMMISSIONING

- A. Equipment and systems referenced in this section shall be commissioned per Section 23 08 00. The Contractor has specific responsibilities for scheduling, coordination, test development, testing and documentation.

END OF SECTION

SECTION 23 05 93 – TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Air Balancing
- B. Report

1.2 RELATED SECTIONS

- A. Division 23 - HVAC

1.3 REFERENCES

- A. Associated Air Balance Council: National Standards for Field Measurements and Instrumentation.
- B. ASHRA: 2005 Handbook of Fundamentals.
- C. American Conference of Governmental Hygienists: Industrial Ventilation, a Manual of Recommended Practice.
- D. Refer to Appendix "A" for reference drawings for testing, adjustment and balancing.

1.4 GENERAL REQUIREMENTS

- A. General: The air balancing shall be done by a company which specializes in this type of work and is totally independent and separate from the company or contractor which has installed the systems to be balanced (unless approved through substitution request prior to bid opening).
- B. Approved Balancers: if other than approved balancing subcontractor noted below, the contractor shall submit all necessary information for City engineering review prior to acceptance. It is the City's engineer's determination if the submitted balancing contractor is approved to do the work.
 - 1. TAC Services, LLC.
 - 2. MacDonald Miller Facility Solutions
 - 3. Harden & Sons
 - 4. Neudorfer Engineering
- C. Prior to beginning balancing, submit the name of the company the contractor proposes to have complete the balancing to the City Engineer for approval.
- D. Engineer: The final report of this work shall be accompanied by a statement that the work complies with the Associated Air Balance Council Standards and these project specifications.
- E. Notify the City Engineer in writing of all problems or discrepancies between actual conditions and what design documents show as work proceeds.
- F. The Balancer shall be directly responsible to the City Engineer and shall perform this work as directed by the City Engineer.

1.5 SCOPE OF WORK

- A. Building HVAC: The Administration Building North (ABN) has six (6) floors, 5th floor penthouse, 4th floor, 3rd floor, 2nd floor, main floor, and ground floor. The 5th floor penthouse distributes the air to an east air shaft and to the west air shaft. These air

shafts distribute air to the south and north sides of the building. From the 3rd floor down to the ground floor, both north and south side have a three (3) control damper system. The 4th floor operates with independent variable air volume (VAV) equipment.

- B. Preliminary air balance Phase – 1 (to include, but not limited to):
 - 1. Fan Room (existing): Provide static pressure before filters, after filtering, supply duct static, return duct static, fan RPM, motor Hz, motor AMPs, total air-flow main duct (traverse reading).
 - 2. Main supply ductwork for ALL floors: Provide duct static pressure after control dampers, total air-flow (traverse readings). If traverse air-flow reading cannot be measured, all supply grilles shall be measured for air-flow totals.
- C. Preliminary air balance Phase – 2 (to include but not limited to):
 - 1. Fan room with new fan-wall installed and commissioned, but before demo of old fan.
 - a. With old fan off and new fan-wall in operation and enclosed. Provide multiple supply and return static pressure reading as the fan-wall is modulated between low speed and high speed to detect excessive static pressure within the fan room. Also measure static pressure within the discharge side of the existing fan for reference.
- D. Final air balancing after old fan is removed and room enclosed (to include, but not limited to):
 - 1. Fan Room (New): Provide static pressure before filters, after filtering, supply duct static, return duct static, fan RPM, motor Hz, motor AMPs, total air-flow main duct (traverse reading).
 - 2. Main supply ductwork for ALL floors: Provide duct static pressure after control dampers, total air-flow (traverse readings). If traverse air-flow reading cannot be measured, all supply grilles shall be measured for air-flow totals.
 - 3. Outside air (OSA):
 - a. Measure outside air with new OSA control damper 100% open multiple times as the fan-wall is modulated from low speed to high speed. Document based on fan speed, Hz, and supply duct static to form a relationship of how much OSA is provided. Verify percent (%) accuracy based on OSA control software.
 - b. Measure OSA with fan-wall at set static (1.2-inch) modulate OSA damper open from zero (0) to one hundred (100) percent. Take air-flow reading at 10% increments.

PART 2 - PRODUCTS

2.1 GENERAL INSTRUMENTATION

- A. Balancing equipment shall comply with Associated Air Balance Council recommendations for field measurement instrumentation.
- B. All measuring instruments shall be accurately calibrated and maintained in good working order. Calibration dates and certifications shall be available at engineer's request.
- C. Instruments shall be capable of:
 - 1. Air velocity instruments, direct reading in feet per minute with 2% accuracy.
 - 2. Static pressure instruments, direct reading in inches water gauge with 2% accuracy.

3. Tachometers, direct reading in revolutions per minute with 1/2% accuracy; or revolution counter accurate with 2 counts per 1,000.
4. Thermometers, direct reading in degrees Fahrenheit with 1/10 of a degree accuracy.
5. Pressure gauges, direct reading in feet of water or psig with 1/2% accuracy.

PART 3 - EXECUTION

3.1 GENERAL

- A. All air systems shall be completely balanced and adjusted to provide the air flow rates indicated, and to produce an even heating and cooling effect and control response.
- B. Consult and coordinate with other Division 23 – HVAC contractors for the adjustment of all control devices to allow for proper system operation.
- C. Make final adjustments for flow rates in order to optimize each space's comfort, including such considerations as temperature, drafts, noise, pressurization, and air changes.
 1. Where variances are made from design values, state reasons in report (e.g., "too noisy", "too drafty," etc.).
 2. All such variances are subject to approval by the City Engineer.
- D. All measurements and adjustments shall be in accordance with the Associated Air Balance Council National Standards.

3.2 PRELIMINARY AND FINAL BALANCING REQUIREMENTS

- A. The contractor shall provide in their bid to perform a complete preliminary air balance (Phase 1, Phase 2) and a complete final air balance based on any required changes deemed necessary by the engineer due to installing Division 23 – HVAC contractor's deficiencies.
 1. Preliminary balancing (Phase 1, Phase 2): This requires the balancing company to provide a complete preliminary balancing of all the HVAC equipment to set airflows and determine inefficiencies that need to be addressed as listed in bid documents.
 2. Final balancing: This requires the balancing company to provide a complete final balancing of all HVAC equipment. Showing corrections based on inefficiencies. This may require the balancing company to redo the initial preliminary balancing as required to finalize a proper balanced system as listed in bid documents.

3.3 AIR BALANCING

- A. Pre-check of system: Prior to beginning balancing, perform, as a minimum, the following:
 1. Verify that clean filters have been installed, that system is free from debris, and that all inlets/outlets are not obstructed.
 2. Check all fans and equipment to verify that proper start-up and system preparation has been done by the installing contractor.
 3. Check fan room opening status to insure room is ready and proper pressurization can be obtained.
 4. Open all dampers to full flow positions, check positions and operation of all motorized dampers to allow full system flows.
 5. Review controls and sequences of operation

- C. Air balancing shall be done with new, clean air filters installed.
- D. Adjust fan speeds and fan drives as required to produce design air quantities.
- E. Measurements and adjustments of the air handling and distribution equipment shall be executed in a manner consistent with the manufacturer's recommendations.
- F. Air flow measurements in main ducts shall be made with a duct traverse using a pitot tube and micromanometer.
 - 1. Summation of air terminal outlets and inlets is not sufficient unless duct traverse cannot be completed.
 - 2. Quantity of duct leakage shall be indicated at the fan room.
- G. Duct traverses in rectangular duct shall measure the center of equal areas in the air flow stream, with centers not more than 6-inches apart.
 - 1. Round duct traverses shall measure at least twenty (20) locations, with locations being the center of equal annular area.
 - 2. Reference the ACGIH Industrial Ventilation Manual, Chapter 9, Testing of Ventilation Systems.
- H. Requirements for all air handling systems: Data to be measured/recorded and provided in report:
 - 1. Floor plans clearly showing and identifying all ducts and all other items where air flow rates were measured.
 - 2. The connected voltage and corresponding nameplate full load amps, and the initial and final amperages of all fan motors.
 - 3. Initial and final RPMs of all fans.
 - 4. Static pressures on inlet and outlet of all fans.
 - 5. Fan initial and final CFMs.
 - 6. Outdoor air CFMs (record values) per Section 23 05 93, 1.5

3.4 BALANCING REPORT

- A. General: A balancing report shall be submitted as specified herein, documenting all balancing procedures and measurements.
- B. Preliminary Report (Phase 1 and Phase 2): Two (2) preliminary review copies of the balancing report shall be submitted to the engineer when the balancing work is 90% complete (or as near 90% complete as possible due to uncompleted work on other trades).
 - 1. In addition to containing all the information required of the final report, the preliminary report shall contain a list of all the work required of other trades in order to allow the balancing work to be completed.
 - 2. The engineer will review the preliminary reports and inform the contractor of any additional items or revisions required for the final report.
- C. Final Report: Shall be included in the Operation and Maintenance Manual.
 - 1. Submit reports to contractor for inclusion in manuals (or, when manuals have been already sent to engineer, send report to engineer who will insert report into manual).
 - 2. Provide number of reports as required to match quality of O&M Manuals.

D. Report Organization: The report shall be divided into logical sections consistent with the building or system layout (i.e. by floors, building wings, air handling units, or other convenient way).

1. Tabulate data separately for each system.
2. Describe balancing method used for each system.

E. Format: 8 1/2-inch x 11-inch size, neat, clean copies, drawings accordion folded.

1. Report shall be typed, shall have a title page, table of contents, and divider sheets with identification tabs between sections.
2. Information shall be placed in a three hole notebook, with the front cover labeled with the name of the job, owner, engineer, balancing contractor, and report date.

F. GENERAL BALANCING INFORMATION REQUIRED

1. At the beginning of the report, include a summary of problems encountered, deviations from design, remaining problems, recommendations, and comments.
 2. List of instruments used in making the measurements and instrument calibration data.
 3. Names of personnel performing measurements.
 4. Explanation of procedures used in making measurements and balancing each system.
 5. List of all correction factors used for all diffusers, grilles, valves, venture meters, and any other correction factors used.
 6. Areas where difficulties were encountered in obtaining design flow rates, or where unstable operating conditions may exist.
 7. Note any parts of the system where objectionable drafts or noises may be present and efforts made to eliminate same and why they may still be present.
 8. Note where variances from design values occur; explain why.
- G. Air Balancing Information: All previously cited required measurement/recorded data, any additional recorded data, and observations.

END OF SECTION

SECTION 23 08 00 – MECHANICAL SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes Division 23 responsibilities and participation in commissioning process to demonstrate compliance of mechanical systems in accordance with the Contract Documents.
- C. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01, and Sections 23 05 05, 23 05 93, 23 08 10, and 23 08 20 apply to the Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.

B. CODES AND STANDARDS

- 1. Applicable energy code.
- 2. ASHRAE Guideline 0, The Commissioning Process.
- 3. ASHRAE Guideline 1, The HVAC Commissioning Process

1.3 DEFINITIONS

- A. The words “Commissioning Authority” as used in Section 23 08 00 Mechanical System Commissioning, Means – The City.

1.4 CONTRACTOR RESPONSIBILITIES FOR COMMISSIONING

A. GENERAL

- 1. Commissioning is responsibility of Division 23 subcontractors, their subcontractors, and their equipment suppliers.
- 2. Divisions 23 subcontractors are responsible to provide support required for start-up, testing, and commissioning.
- 3. Commissioning process requires that portions of the Work have been completed in satisfactory and fully operational manner.
- 4. Include commissioning status during construction phase to monitor progress.

B. BASIC COMMISSIONING SUPPORT

- 1. Within twenty (20) days after contract award to the Contractor, prepare preliminary schedule in conjunction with the Commissioning Authority and the A/E for duct system testing, equipment start-up and testing, adjusting and balancing, start-up and completion for verification by the Commissioning Authority. Include schedule in master project construction schedule. Update schedule as appropriate.
- 2. Give minimum forty eight (48) hours prior notice to the Commissioning Authority and the A/E when duct system testing, startup of each piece of equipment and testing, adjusting and balancing will occur. Be responsible to notify the Commissioning Authority and the A/E when commissioning activities not yet performed or not yet scheduled will delay construction. Be proactive in seeing that commissioning processes are executed and that the Commissioning Authority and the A/E have scheduling information needed to efficiently execute commissioning.
- 3. Schedule start-up and testing of equipment and systems.

4. Assist in testing, adjusting, and balancing. Allow sufficient time before commissioning commences so that testing, adjusting, and balancing can be accomplished and deficiencies corrected.
5. Operate equipment and systems for commissioning tests.
6. Assign qualified personnel for participation in commissioning functional performance tests, including seasonal testing required after initial commissioning.
7. Complete pre-functional test checklists to assure that Division 23 equipment and systems are fully operational and ready for functional testing.
8. Assist in functional performance testing to verify equipment and system performance.
9. Furnish equipment, materials, and labor necessary to correct deficiencies found during commissioning process which fulfill contract and warranty requirements.
10. Prepare operations and maintenance information and Record Drawings.
11. Assist in developing system operation descriptions.
12. Schedule and arrange for training for systems specified.
13. Coordinate with equipment manufacturers to determine specific requirements to maintain warranties.
14. Correct deficiencies and submit signed documentation to the Commissioning Authority and the A/E that deficiencies have been corrected.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT

- A. Description: Test equipment as necessary for start-up and testing of mechanical equipment.

B. PROPRIETARY TEST EQUIPMENT

1. For products in which proprietary test equipment is needed for functional performance testing, product manufacturer shall furnish test equipment, demonstrate its use, and assist the Commissioning Authority in commissioning process. Proprietary test equipment shall become property of the Owner upon completion of commissioning.
2. Identify proprietary test equipment required in test procedures submittals and in separate list of equipment to be included in the Operations and Maintenance Manuals.

PART 3 - EXECUTION

3.1 WORK PRIOR TO COMMISSIONING

A. DESCRIPTION

1. Complete all phases of the Work so various systems can be started, tested, adjusted, balanced, and otherwise commissioned. Submit written notification to the Owner's representative, the Commissioning Authority, and the A/E that systems have been calibrated, tested, are operating properly, and are ready for commissioning at least fourteen (14) days prior to scheduled commissioning.
2. Division 23 subcontractors have primary start-up responsibilities with obligations to complete systems, including sub-systems, so they are fully functional. This includes complete installation of equipment, materials, duct, wire, controls, and similar items per the Contract Documents and related directives, clarifications, and change orders.

B. COMMISSIONING PLAN

1. The Commissioning Authority will develop the Commissioning Plan. Assist the Commissioning Authority in preparing commissioning plan by submitting necessary information pertaining to actual equipment and installation.
2. Make system modifications and clarifications in contractual requirements of this and related sections of work at no additional cost to the City.

C. PRE-COMMISSIONING WORK

1. Attend a commissioning scoping meeting and other meetings necessary to facilitate the commissioning process. One representative of the Division 23 subcontractor cognizant of aspects of Division 23 work shall attend commissioning meetings. Other trades shall attend commissioning meetings when their portions of the Work are being tested.
2. Start-up and testing services for equipment, including but not limited to the following:
 - a. Air-handling and distribution equipment.
 - b. Controls.
 - c. ECM control panel.
 - d. Outside air-flow monitoring station
3. Normal start-up services required to bring each system into a fully operational state. This includes cleaning, filling, purging, leak testing, motor rotation check, control sequences of operation, full and part load performance, and similar conditions.
4. The Division 23 subcontractor shall perform pre-functional tests on equipment and systems.
5. Completion of controls installation, calibration, programming, and testing is critical for efficient and successful commissioning process.
6. The Commissioning Authority will not begin commissioning process until each system is complete, including normal contractor start-up.
- B. Scheduling: Commissioning is intended to begin upon completion of each system. Commissioning may proceed prior to completion of systems and sub-systems subject to coordination with the Commissioning Authority. Starting of commissioning before system completion will not relieve Division 23 subcontractors from completing those systems per construction schedule.

3.2 PARTICIPATION IN COMMISSIONING

A. DESCRIPTION

1. Start-up and testing of systems specified in Division 23 by skilled technicians. Make these same technicians available to assist the Commissioning Authority in completing commissioning program as it relates to each system and their technical specialty.
2. Coordinate work schedules, time required for testing, and similar conditions with the Commissioning Authority. Ensure that qualified technicians are available and present during agreed upon schedules and for sufficient duration to complete necessary tests, adjustments, and problem resolutions.
- D. System Problems and Discrepancies: These may require additional technician time, redesign, and reconstruction of systems and system components. Make additional technician time available for subsequent commissioning periods until required system performance is obtained.
- E. Qualifications of Technicians: The Commissioning Authority and the A/E have right to judge appropriateness and qualifications of technicians relative to each item of

equipment or system. Qualifications of technicians include expert knowledge relative to specific equipment involved, adequate documentation and tools to service/commission equipment, and attitude and willingness to work with the Commissioning Authority and the A/E to get the Work done.

- F. Functional Performance Test: Initial Functional Performance Test procedures will be written by the Commissioning Authority. Assist the Commissioning Authority in developing final Functional Performance Tests. Perform final Functional Performance Tests.

3.3 WORK TO RESOLVE DEFICIENCIES

A. DESCRIPTION

1. In some systems, misadjustments, misapplied equipment, and deficient performance under varying loads will result in additional work being required to commission systems. Complete Work under direction of the Commissioning Authority with input from appropriate subcontractor and equipment supplier.
2. Whereas members will have input and opportunity to discuss the Work and resolve problems, the A/E will have final authority on necessary work to be done to achieve performance.

B. TIMING

1. Complete corrective work to permit completion of commissioning process.
2. Experimentation to achieve system performance permitted. If the Commissioning Authority deems experimentation work is ineffective or untimely as it relates to commissioning process, the Commissioning Authority will indicate the nature of problem, expected steps to be taken, and deadline for completion of activities.
3. If deadlines pass without resolution of the problems, the City reserves right to obtain supplementary services and equipment to resolve problems. Costs incurred to solve problems in an expeditious manner will be Division 23 subcontractors' responsibilities.

3.4 ADDITIONAL COMMISSIONING

- A. Additional commissioning activities may be required after system adjustments, replacements, and similar activities are completed. Division 23 subcontractors and their suppliers shall include a reasonable reserve to complete this work as part of their standard contractual obligations.

3.5 DEFERRED TESTING FOR PRELIMINARY AND POST FAN-WALL INSTALLATION

A. DESCRIPTION

1. Preliminary fan-wall commissioning pertains to where the fan-wall has been installed, but the existing supply fan has yet to be demoed. The fan-wall system will be installed, tested and preliminary commissioned prior to existing supply fan removal (demo). The fan-wall will be powered separately to allow for existing fan to be off and allow fan-wall to be tested and preliminary commissioned.
2. Final fan-wall commissioning pertains to where the fan-wall has been installed and the existing supply fan has been demoed. The fan room has been modified and complete. Final commissioning may be delayed six (6) to nine (9) months after the preliminary fan-wall commissioning. The existing supply fan shall not be demoed until moderate spring or fall weather occurs with estimate outside air and between 60°F to 65°F.

B. NON-PEAK SEASONS

1. Subsequent commissioning may be required under conditions of minimum and maximum occupancy or use.
2. Equipment and systems affected by occupancy variations may be tested and commissioned at minimum loads to observe system performance.
3. Division 23 subcontractors are responsible to participate in occupancy sensitive testing of systems to provide verification of adequate performance.

3.6 HVAC SYSTEMS TRAINING

A. COMPLY WITH REQUIREMENTS IN SECTION 23 08 10

1. Participate in training of the City's engineering and maintenance staff on each system and related components, as required in Divisions 01 and 23 sections.
2. Conduct training in classroom setting with system and component documentation and suitable classroom training aids.
3. Conduct field training as necessary to facilitate instruction on specific equipment and systems.
4. Conduct training jointly with the Commissioning Authority, Division 23 subcontractors and their subcontractors, and equipment vendors. The Commissioning Authority will be responsible for highlighting system peculiarities specific to this project.

3.7 SYSTEMS DOCUMENTATION

- A. Drawings: Maintain as-built red-lines as required in Division 01 and Section 23 05 00.
- B. Operations and Maintenance Data: Comply with requirements in Section 23 08 20. Submit one copy of equipment technical literature, operations and maintenance literature, and shop drawings as soon as they are available. This requirement is for review of documents prior to distribution of multiple copies for the Owner's final use.

END OF SECTION

SECTION 23 09 00 – AUTOMATIC TEMPERATURE CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes design, components, hardware, and construction for complete installation of operational control system.
- B. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 sections apply to the Work in this section.
- C. Extent: Modify existing control systems including associated equipment and accessories. Provide control system complete and operating as required by the Contract Documents. Manufacturer's products, including design, materials, fabrication, assembly, erection, examination, inspection, and testing shall be in accordance with NFPA 70, except as indicated otherwise on the Drawings and this section.
- D. Scope of Control Work:
 - 1. Fan System: Control equipment, programming, and graphic changes /modifications to facilitate removal of the existing central HVAC supply air fan and installation of the new central HVAC supply air fan-wall, consisting of multiple smaller fans to replace the existing single large fan. BMS interface with the new fan controller, both through BACnet and a direct connection to the existing duct static pressure sensor. If existing duct static pressure sensor can not be used due to age or function, replace with new.
 - 2. Control equipment, programming, and graphic changes /modifications to facilitate installation of new HVAC outside air monitoring system and outside air control modulation damper.
- E. Although such work is not specifically indicated on the Drawings or in this section, include supplementary and miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, and complete operating installation.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.

B. CODES AND STANDARDS

- 1. Applicable energy code.
- 2. AMCA Standard 500-D, Laboratory Methods of Testing Dampers for Rating.
- 3. AMCA Publication 511, Certified Ratings Program – Product Rating Manual for Air Control Devices.
- 4. NFPA 70, National Electrical Code.
- 5. NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.
- 6. UL 506, Specialty Transformers.
- 7. UL 873, Standard for Temperature-Indicating and -Regulating Equipment.
- C. Control System Subcontractor's Qualifications: Subcontractor that will perform the work shall have completed at least five (5) control systems installations of same type and design as required by the Contract Documents which have successfully operated required sequences of operation for at least three (3) years.

1. All bidders must be authorized distributors or branch offices of manufacturers specified.
2. The following bidders have been prequalified
 - a. **Schneider Electric as listed by Sound Energy Systems (253) 475-3525.**

D. STANDARD PRODUCTS:

1. Material and equipment standard products of manufacturer regularly engaged in manufacturing of such products. Standard products shall have been in commercial or industrial use for one (1) year prior to bid opening. One year use shall include applications of similarly sized equipment and materials used under similar circumstances.
2. Equipment items supported by a service organization.
- E. Control System Verification: Become familiar with details of work and verify dimensions in field. Advise A/E of any discrepancy before performing work.
- F. Installation: System designed and constructed by authorized representative of product manufacturer. Carefully investigate mechanical, electrical, and finish conditions that could affect work to be performed and furnish materials and labor necessary to meet such conditions.

1.3 SUBMITTALS

- A. General: Comply with requirements in Division 01 and Section 23 05 00.
- B. Product Data: Submit manufacturer's technical product data and maintenance data for the following:
 1. Sensing and control hardware.
 2. Controlled hardware.
 3. Auxiliary components.
 4. Control wiring.

C. SHOP DRAWINGS

1. General: After approval of product data, submit Shop Drawings. Label components with tag numbers. Include index of symbols and abbreviations. Do not commence installation until Shop Drawings are accepted by the A/E.
 - a. The City can provide the contractor existing as-built control drawing upon request.
2. Schematic Diagrams:
 - a. Include for each system (for example, fan system, pumping system, process) showing controls, relays, contactors, actuators, switches, and associated components.
 - b. Indicate instrument settings.
 - c. Indicate field wiring and interconnecting equipment and devices.
 - d. Identify type and size of wire and assign unique numbers or colors to every wire.
 - e. Identify equipment and devices by reference designators. Include materials list on each drawing.
 - f. Block diagrams and schematics showing layout of computers, controllers, communication cabling, wire type, count and conduit fill.

- g. Schematic showing general mechanical system layout with sensors/devices of each mechanical system shown with corresponding detail and labeling.
- h. Include items not specified herein or indicated on the Drawings but necessary to perform functions in sequences of operation for a complete and operational control system.
- 3. Floor Plans: Indicate locations of systems, equipment, components, and wiring. Identification consistent with nomenclature used in other documentation.
- 4. Sequences of Operation:
 - a. Include narrative description for each system based on vendor's implementation of control logic.
 - b. Include initial values of variables. Variables described as user adjustable shall also be available for adjustment at the operator work station.
 - c. Sequences of operations shall describe not just what the equipment does, but also how the equipment achieves its desired performance.
 - d. Sequences of operation shall also be available as text file on the operator work station.
 - e. Sequences of operation as presented on the Drawings not acceptable.
- 5. Typical Wiring Diagrams
 - a. Indicate internal wiring of control panels.
 - b. Indicate general physical arrangement of component devices installed in the control panels.
 - c. Include elementary ladder diagrams to show function of circuits employing switching logic.
 - d. Include panel schedule show in location, systems served and point count.
- C. Qualifications: Submit documentation as defined under Paragraph "Control System Subcontractor's Qualifications".

D. CONTROL SYSTEM FIELD TEST DOCUMENTATION

- 1. Functional Tests: Submit test report forms demonstrating compliance with Article "Field Testing and Verification". Documentation shall consist of expected and actual response of sensors, actuators, and controllers. Submit documentation of control loop stability and accuracy, proper execution of sequences of operation, and proper operation of equipment interlocks.

E. RECORD DOCUMENTS

- 1. General: Submit Shop Drawings for each control system showing installed condition. As a minimum, include diagrams and documents listed in Paragraph "Shop Drawings" with sequences of operation. Include test report forms specified in Paragraph "[Control] System Field Test Documentation". Submit documents in commonly readable and modifiable formats. Drawings in AutoCAD ".dwg" format. Other documents in Microsoft ".xls" or ".doc" formats acceptable. Include controller databases, graphics databases, and server and operator workstation configuration files.
- 2. Flow Charts and Wiring Diagrams: Include in 11 x 17 size, laminated, and bundled with "ring". Locate the entire bundled set at the operator workstation. In addition, for specific diagrams, locate at their respective enclosure.

1.4 CONTROL SYSTEM OPERATIONS AND MAINTENANCE MANUAL

- A. General: Comply with requirements in Division 01 and Sections 23 05 00 and 23 08 20. Include the following:
 - 1. Functional design.
 - 2. Hardware.
 - 3. Software.
 - 4. Operation.
 - 5. Maintenance.
- B. Functional Design: Operational requirements of system, theory of operation, design philosophy, and specific functions. Include description of hardware and software functions, interfaces, and requirements for system operating modes.

C. HARDWARE

- 1. General description and specifications.
- 2. Installation and checkout procedure.
- 3. Equipment electrical schematics and layout drawings.
- 4. System schematics and I/O wiring lists.
- 5. Alignment and calibration procedures.
- 6. Manufacturer's repair parts list indicating sources of supply.
- 7. Interface definition.
- D. Operation: Procedures and instructions for operation of system. Include the following:
 - 1. System start-up and shut-down.
 - 2. Use of system, command, and applications software.
 - 3. Alarm presentation.
 - 4. Recovery and re-start procedures.
 - 5. Use of report generator including trendlogs.
- E. Maintenance: Descriptions of maintenance for equipment including inspection, periodic preventative maintenance, fault diagnosis, and repair or replacement of defective components.
- F. Shop Drawings: Include in both hard copy and in CD/DVD formats.

1.5 RELATED WORK

A. TESTING, ADJUSTING, AND BALANCING (TAB) WORK

- 1. Furnish eight (8) hours of personnel to TAB organization specified in Section 23 05 93 to provide adjustments to control system for setup of TAB work. Adjustments to control system following completion of TAB work shall maintain settings of TAB work.
- 2. Include services of control system start-up technician for eight (8) hours to operate system during capacity tests, flow tests, minimum outdoor airflow tests, and other tests for which TAB work requires adjustments to control system.
- 3. Fine tune controls after TAB work is complete.

1.6 WARRANTY

- A. Include services, materials, and equipment necessary for successful operation of control system for period of one year after Substantial Completion date.
- B. Adjustment, required testing, and repair of system includes transmission equipment, sensors, and control devices.
- C. At end of warranty period, control system subcontractor shall recheck entire system operation, including calibration testing of sample number of components and performing necessary control adjustments for proper system operation. Such work shall be for minimum of sixteen (16) man-hours in conjunction with the Owner's technicians.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers:
 - 1. Controls System: Schneider Electric MNL LON (No Substitute)
 - 2. Control Dampers: Ruskin, Green Heck
 - 3. Actuators: Belimo (No Substitute)
 - 4. Outside Air Flow Monitoring System: Ebtron

2.2 SENSING AND CONTROL HARDWARE

A. GENERAL CONDITIONS

- 1. All DDC Controls installed at Tacoma Power Campus are LonWork MNL controllers manufactured by Schneider Electric.
- 2. The following are part numbers of controllers to be used for system consistency.
 - a. MNL-5RS3
 - b. MNL-10R93
 - c. MNL-15RS4
 - d. MNL-20RS4
 - e. MNL-800-101
 - f. MN-S2-500
 - g. MN-S3-500

B. TRANSMITTERS

- 1. General
 - a. Output 4 to 20 mA or 2 to 10 VAC, linearly scaled to temperature, pressure, or flow range being sensed.
 - b. Total error not to exceed 0.1 percent of 20mA (0.02mA) at any point across 4 to 20mA span.
 - c. Supply voltage 24 VAC or 24VDC.
 - d. Noninteractive offset and span adjustments.
 - e. Spans and Ranges - Temperature: 100°F Span: Outside air, domestic hot water, heating coil discharge air, and mixed air sensors.

- f. Spans and Ranges - Pressure:
 - 1) Minus 0.1 to Plus 0.1 Inch of Water Differential Range: Room static pressure control.
 - 2) Minus 1.0 to Plus 1.0 Inch of Water Differential Range: Duct, filter, or fan static pressure.
 - 3) 0 to 5 Inch of Water Differential Range: Duct or fan static pressure.

C. DIFFERENTIAL AIR PRESSURE TRANSMITTER

- 1. Device with integral pressure transducer and transmitter. Include offset and span adjustments.
- 2. Sensing element either capsule, diaphragm, bellows, Bourden tube, or solid state.
- 3. Rated for 150 percent of working pressure.
- 4. Accuracy plus or minus 1 percent corresponding to pressure span.
- 5. Linearity 0.1 percent.
- 6. Output 4 to 20mA signal proportional to pressure span.
- 7. Supply voltage 24VAC or 24VDC.

2.3 ACTUATORS

- A. Actuators shall be Belimo heavy-duty reversible type, driving motor and gear train type.
 - 1. Unit shall have a sealed case.
 - 2. All actuators shall be proportional type.
 - 3. Actuators shall have a built-in electro-mechanical system to provide for positive repeatability of position, regardless of changes in output load.
 - 4. Actuators shall have a built in switch for reversing the direction of the actuator.
 - 5. Spring return actuators shall have a manual positioning crank non-spring return actuators shall have a manual gear release handle.
 - 6. Actuators shall be designed for a minimum of 60,000 full stroke cycles at the rated torque and shall have a two (2) year manufacturer's warranty.
- B. Units shall be complete with all linkages, brackets, and hardware required for mounting and to allow for the proper control of the regulated damper or valve.
- C. Actuator shall spring return upon power interruption (except not required at air terminal units).
 - 1. Actuator shall "fail safe" in open or closed position as dictated by freeze, fire or temperature protection requirements.

2.4 AIRFLOW MEASURING UNITS

- 1. Description: Airflow Station with array of velocity sensing elements for mounting in ducts, plenums, or outside air intakes or station with array of airflow sensing probes designed for mounting inside fan inlet bell-mouth.
- 2. Device consists of one or more multi-point airflow measuring probes (two (2) probes for each fan inlet application) and a single microprocessor-based transmitter.
- 3. Each transmitter with LCD display capable of displaying airflow as a velocity or volumetric airflow rate, and temperature, in either IP or SI units.

4. Each sensing point shall independently determine airflow rate which shall be equally weighted and averaged by transmitter prior to output. Devices which average multiple non-linear sensing point signals not acceptable.
5. Accuracy of $\pm 2\%$ of reading over entire operating airflow range. Unit factory wind tunnel calibrated or verified against reference standards directly traceable to NIST.
6. Installed accuracy, when installed in accordance with manufacturer's guidelines, without field adjustment as follows throughout operating airflow range:
 - a. Ducts and plenums: $\pm 3\%$ of reading.
 - b. Outside air intakes: $\pm 5\%$ of reading.
 - c. Fan Inlets: $\pm 10\%$ of reading throughout operating airflow range.
7. Transmitter will include a Bluetooth low energy interface capable of transmitting all transmitter setup parameters, diagnostics, average airflow and temperature of the device and the airflow and temperature of each sensor node. Software capable of capturing and displaying this transmission will be available via download to Android or iOS phone or tablet. Transmitter will also communicate with CCD system specified in this section with following interface options:
 - a. Linear analog output signal: Field selectable, fuse protected, and isolated, 0 to 5VDC, 0 to 10VDC and 4 to 20mA corresponding to average velocity or CFM and temperature measurement.
 - b. RS-485: Field selectable BACnet MS/TP or Modbus-RTU.
 - c. Option Ethernet: Field selectable BACnet Ethernet or BACnet IP, Modbus TCP and TCP/IP.
8. Velocity sensing elements glass-in-bead thermistor type. Chip thermistors are not acceptable.
9. Resistance to air flow not to exceed 0.02" w.g. at 2,000FPM velocity.
10. Station construction suitable for operation to
 - a. 5,000 fpm velocity for ducts, plenums and outside air intakes.
 - b. 10,000 fpm for fan inlets.
11. Operating temperature range for measuring probes: -10F to 160F. Operating humidity range for measuring probe 5 to 95% relative humidity (non-condensing). Operating temperature range for transmitter minus -20F to 120F. Protect the transmitter from weather and water.
12. 24VAC powered. Inputs internally isolated. Both inputs and outputs possess heavy duty fault protection.
13. Listings and Certifications: Unit shall be listed and labeled as assembly in accordance with UL/cUL 873. Non-UL listed devices are not acceptable. Units supplied with RS-485 interface and BACnet protocol shall be BTL Listed. Units shall be tested and certified to carry the CE Mark.
14. Manufacturers: Ebtron Model GTx116-P+ or approved for ducts, plenums and outside air intakes and Ebtron Model GTx108-F or approved for fan inlets.

2.5 AUXILIARY COMPONENTS

A. NAMEPLATES AND TAGS.

1. Laminated engraved plastic or brass nameplates for equipment and devices.

2. Identify equipment name by function, such as "COLD DECK TEMPERATURE", and point identification number as shown on record control drawings as plain text device description, such as "SPS-18 STATI PRESSURE SENSOR".
3. Laminated plastic 1/8-inch thick, black and white letters.
4. Minimum size 1-inch by 3-inch, with minimum of 3/8-inch high engraved block lettering.

2.6 ELECTRIC POWER AND DISTRIBUTION

- A. Source: 120 V or less, 60 Hz, two-pole, 3 wire with ground. Devices UL listed and labeled or FM approved. Coordinate with Division 26.

B. TRANSFORMERS

1. Limited energy type step down type with capacity to operate simultaneously connected apparatus with 25 percent overload for 1 hour.
2. Comply with UL 506.
3. Coordinate with Division 26.

2.7 CONTROL WIRING

A. GENERAL

1. Include wire and cable not shown on electrical drawings as required for complete and operable control system including wiring to transformer primaries.
2. Conform to NEC and Division 26 requirements.
3. Circuits operating at more than 100 V in accordance with Division 26.
4. Circuits operating at 100 V or less defined as low voltage and run in rigid or flexible conduit, metallic tubing, metal raceways or wire trays, armored cable, or multi-conductor cable.
5. Include transformers to supply power for low voltage circuits.
6. Use multi-conductor cable for concealed accessible locations only.
7. Include circuit and wiring protection as required by NFPA 70.
8. Provide printed labels at controllers identifying connected devices with name and number. Device numbers only not acceptable.

B. CONTROL WIRING

1. Copper No. 18 AWG minimum with 300 V insulation, stranded.
2. Wire used for analog functions twisted and shielded, 2, 3, or 4 wire to match analog function hardware.
3. Copper No. 16 AWG within control panels for binary outputs and pilot relay.
4. Multi-conductor wire with outer PVC jacket.
5. Insulation rating for control wiring installed in control panels and other enclosures with power circuit conductors no less than that for power circuit conductors.

C. SENSOR WIRING

1. Copper No. 20 AWG minimum, stranded, twisted and shielded, 2, 3, or 4 wire to match analog function hardware, with No. 20AWG drain wire. Exception: Direct connect RTD wiring single No. 18AWG minimum twisted pair, 100 percent shielded with No. 20AWG drain wire.
2. Multi-conductor wire with outer PVC jacket.

- D. Aluminum Wiring: Not acceptable.
- E. Line Voltage Wiring: Wiring for 120V single conductor, copper No. 14AWG minimum, rated for 600V service.
- F. Plenum Cable: UL listed and labeled for plenum use.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Description: Verify installation conditions as satisfactory to receive the Work of this section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 PREPARATION

- A. Field Measurements: Field verify locations of new and existing work prior to commencing the Work of this section.
- B. Protection: Protect surrounding areas and surfaces to preclude damage from the Work of this section.

3.3 INSTALLATION, APPLICATION, ERECTION, AND PERFORMANCE

- A. General: Install, apply, erect, and perform the Work in accordance with Article "Quality Assurance" provisions, specifications, and manufacturer's installation instructions and directions. Where these may be in conflict, the more stringent requirements govern.

3.4 CONTROL SYSTEM, GENERAL

- A. Description: Install devices and hardware required to ensure complete and operating control system in accordance with sequences of operation.
- B. Quality: Install components and wiring in neat and workmanlike manner, using trained mechanics, conforming to applicable codes. Perform installation under supervision of competent technicians regularly employed in installation of control systems.
- C. Control Panels: In general, mount four (4) feet six (6) inches above floor, panel top at six (6) feet six (6) inches above floor maximum, with three (3) feet minimum clear access space in front of panels. Indicate locations on the Shop Drawings.

3.5 INSTRUMENTATION AND CONTROLS

A. INSTALLATION, GENERAL

- 1. Install devices to be easily accessible.
- 2. Install to protect instruments, switches, transmitters, and other devices from vibration and high temperatures.
- 3. Panel mount devices unless devices are installed directly on duct or piping.
- 4. In no case shall sensors designed for one application be installed for another application.
- B. Relays and Contactors: Install interposing relays and contactors required to accomplish the sequences of operation.

C. PRESSURE SENSORS AND SWITCHES

- 1. Install in such manner that probe can be easily removed for field calibration and testing.

2. Install pressure sensing tips in locations to sense appropriate pressure conditions.
3. Install duct static pressure tip approximately 2/3 distance from supply fan to end of duct with greatest pressure drop.

D. NAMEPLATES, TAGS, AND LAMINATED SHOP DRAWINGS

1. Nameplates and Tags
 - a. Install at field mounted equipment and devices, engraved with legend, unique identifier, or equipment name to correspond to designations on record control drawings.
 - b. Install on outside face of control panel doors.
 - c. Permanently attach with rivets or screws.
2. Laminated Shop Drawings
 - a. Prior to date of Substantial Completion, provide the Shop Drawings, including control wiring diagrams, ladder diagrams, logic diagrams, flow charts, and similar items, in clear laminated plastic[, eleven (11) by seventeen (17) inch size].
 - b. Prepare full set of the Shop Drawings and deliver to the Owner at the Operator's Workstation.
 - c. Install drawings specific to a control panel within that control panel.
 - d. At end of warranty period, provide replacement laminated Shop Drawings to reflect setpoints that the Owner has established.

3.6 CONTROL WIRING

A. GENERAL

1. Comply with NEC requirements.
2. Label each line voltage power supply with identification of feeder panel and breaker.

B. CONDUIT AND WIREWAYS

1. Conduit and couplings in exposed interior locations, including mechanical equipment rooms, below raised floors, and in HVAC plenums shall be electrical metallic tubing (EMT), hot-dipped galvanized, or electro-galvanized steel tubing with steel compression fittings. Minimum 3/4 inch conduit size.
- C. Wiring within Control Panels: Arrange neatly in grouped horizontal and vertical directions, secured or under removable covers. Rewire non-conforming work as directed by the A/E. Protect exposed wiring from abuse and damage.
- D. Wire Terminations: Make bare to screw terminals specifically designed for bare stranded wire connections, or with self-insulated spade lugs where connected to screw type terminals not specifically designed for bare stranded wire connection.

E. SPLICING

1. Minimize and perform only in accessible outlet, junction, or cabinet boxes that are included on the Drawings.
 2. When splicing is necessary, match insulation colors and mechanically secured conductors to each other so that no stress is applied to the splice.
- F. Wire Runs: Parallel or perpendicular to walls, pipes and sides of openings. Use right angle turns. Do not block passage ways for access and servicing. Do not install control wiring in power circuit raceways. Do not use motor starters and disconnect switches as junction boxes. Install additional junction boxes.

- G. Fill: No conduit shall be filled such that maximum bundled cross sectional dimension exceeds sixty five (65) percent of conduit inside diameter. No raceway filled to more than forty (40) percent, except that maximum fill for surface raceway shall be twenty (20) percent.
- H. Wire Length: Wire run or circuit no longer than eighty (80) percent of maximum allowable length or power consumption for wire size and application. Output circuit not to exceed eighty (80) percent of maximum load capacity specified by manufacturer.
- I. Identification: Conduits entering and leaving terminal cabinets and junction boxes identified in logical and consecutive manner. Use same number only once. Identify conductors with typed or machine lettered labels, Brady or approved. Tag numbers agree with wire numbers assigned on wiring diagrams and installation drawings. Number wires at each connection, termination, and junction box.
- J. Grounding: Ground controllers and cabinets to a good earth ground. Ground controller to ground in accordance with requirements in Division 26. Grounding of green AC ground wire at electrical circuit breaker panel alone, not acceptable. Run metal conduit from controller panels to adequate building grounds. Ground sensor drain wire shields at controller end.

K. ELECTRIC POWER FOR CONTROLS

- 1. Coordinate electrical power source required for work of this section with Division 26.
- 2. Where not shown on electrical drawings, provide power wiring from electrical panel circuit breakers to controls system panels and devices requiring line voltage power. Provide limited energy transformers. Comply with NEC. Provide a disconnect on primary side of transformer and a resettable, fused cut-out on the secondary side of transformer.
- 3. Do not connect control wiring to receptacle or lighting circuits.
- L. Low Voltage Wiring: Comply with requirements in Section 23 05 13.

3.7 SEQUENCES OF OPERATION

- A. Description: Sequences of operation shall include monitoring of the fan controller via BACnet, connecting the existing supply air static pressure transducer to the new fan controller, and integration of an air flow monitoring station for the outside air.
 - 1. Monitoring of the Fan Array Controller: The existing BMS shall connect to the new Fan Array Controller via BACnet interface. The BMS shall add the Fan Array Controller to the graphic display of the existing BMS. The BMS shall monitor and display all operational parameters available through the BMS, monitor and display all Fan Array Controller alarms, and provide remote Fan Array enable/disable through the BMS.
 - 2. Outside Air Flow Monitoring and Control: An air flow monitoring station shall be added to the existing outside air duct, see drawings. The existing BMS shall monitor the air flow monitoring station and display status on the BMS graphic display. The air flow monitoring station shall be integrated into the existing outside air damper sequence to provide a constant ventilation air flow throughout the operating range of the Fan Array, outside air CFM setpoint shall be adjustable and shall be set during system balancing. The ventilation setpoint shall be bypassed during economizer operation.

3.8 CLEAN-UP

A. DESCRIPTION

1. Promptly remove waste material and rubbish as it accumulates.
2. At completion of the Work, clean dirt and construction debris, such as paint, plaster, glue, cement, mastic, tar, paper, tape, and dirt from the installation.
3. In finished areas to be occupied, keep equipment covered during construction. Where this is not practical, clean and refinish item to new condition.

3.9 FIELD TESTING AND VERIFICATION

- A. Field Tests: Calibrate field equipment and devices and verify equipment and system operation before placing the automatic temperature control system on-line.

B. INCLUDE THE FOLLOWING TESTS

1. Preliminary: Observe HVAC system in its shutdown condition. Check motorized dampers for proper normal positions.

C. PERFORMANCE VERIFICATION TESTS

1. Conduct performance verification tests to demonstrate that DDC system maintains setpoints, control loops are tuned, and controllers are programmed for correct sequences of operation.
2. Conduct performance verification test during one week of continuous control systems operation before final acceptance of work.
3. Include the following:
 - a. Execution of Sequences of Operation
 - a. Demonstrate that mechanical system operates properly through complete sequences of operation (for example, seasonal, occupied/unoccupied, and warm-up cycles).
 - 1) Demonstrate that hardware interlocks and safeties operate properly.
 - 2) Graph trends to show sequences of operation are executed in correct order.
 - 3) Demonstrate proper system response for abnormal conditions by simulating these conditions.
 - 4) Demonstrate that system performs sequences of operation after power failure.
 - b. Maximum allowable deviation of controlled values from their setpoints shall be as follows
 - 1) Duct Static Pressure (For Fan Speed Control): Setpoint plus or minus ten (10) percent.
 - c. Test each point reporting to DDC system controllers and remote controllers for specified functions. Sign off test results by DDC system subcontractor and the A/E.

3.10 HVAC SYSTEMS TRAINING

- A. Comply with requirements in Section 23 08 10. System maintenance sessions taught on-site within one (1) month prior to Substantial Completion for four (4) hours.

3.11 COMMISSIONING

- A. Equipment and systems referenced in this section shall be commissioned per Section 23 08 00. The Contractor has specific responsibilities for scheduling, coordination, test development, testing and documentation.

END OF SECTION

SECTION 23 31 00 – AIR DISTRIBUTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes sheet metal work and associated appurtenances.
- B. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 sections apply to the Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.

B. CODES AND STANDARDS

- 1. ASTM A 653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 2. ASTM A 1008, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low-Alloy, High-Strength, Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- 3. ASTM C 423, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- 4. ASTM C 518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- 5. ASTM C 916, Standard Specification for Adhesives for Duct Thermal Insulation.
- 6. ASTM C 1071, Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
- 7. ASTM C 1338, Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
- 8. ASTM C 1524, Standard Test Method for Water-Extractable Chloride in Aggregate (Soxhlet Method).
- 9. ASTM C 1534, Standard Specification for Flexible Polymeric Foam Sheet Insulation Used as a Thermal and Sound Absorbing Liner for Duct Systems.
- 10. ASTM D 1622, Standard Test Method for Apparent Density of Rigid Cellular Plastics.
- 11. ASTM D 1667, Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
- 12. ASTM D 3574, Standard Test Methods for Flexible Cellular Materials-Slab, Bonded, and Molded Urethane Foams.
- 13. ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- 14. ASTM E 90, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- 15. ASTM G 21, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- 16. NAIMA Duct Liner Installation Standards.

17. NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.
18. NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials.
19. SMACNA HVAC Air Duct Leakage Test Manual, (SMACNA Leakage).
20. SMACNA HVAC Duct Construction Standards, Metal and Flexible (SMACNA).
21. SMACNA Rectangular Industrial Construction Standards, (SMACNA Rectangular).
22. SMACNA Round Industrial Construction Standards, (SMACNA Round).
23. UL 181, Standard for Factory-Made Air Ducts and Air Connectors.
24. UL 181B, Standard for Closure System for Use with Flexible Air Ducts and Air Connectors.
25. UL 723, Standard for Test for Surface Burning Characteristics of Building Materials.
26. UL 1381, Outline of Investigation for Aerosol Duct Sealant.

C. DUCT CLEANLINESS REQUIREMENTS

1. Prevent damage to ducts during transportation and off-loading. Deliver only when ducts can be stored under permanent cover. Plastic tarp covering of ducts on jobsite not acceptable.
2. Keep site storage areas clean and dry with minimal exposure to dust.
3. Keep working area clean and dry and protected from weather elements.
4. Prior to installation of individual duct sections, inspect to ensure they are free from debris and wipe internal metal surfaces.
5. Cover duct risers to prevent entry of debris.
6. Cover open ends of ducts and downward facing and horizontal duct openings.
7. If, in the opinion of the A/E, ducts and fittings are not kept clean or completely dry, replace ducts and fittings or clean interior of affected ducts and fittings to satisfaction of the A/E at no additional cost to the Owner.

1.3 SUBMITTALS

- A. Comply with requirements in Division 01 and Section 23 05 00.
- B. Product Data: Submit manufacturer's technical product data and maintenance data for the following:
 1. Sheet metal work, general.
 2. Sheet metal work, miscellaneous.
 3. Duct soundlining, non-fiberglass.
 4. Fasteners.
 5. Hangers for sheet metal work.
 6. Miscellaneous duct accessories.
 7. Blank copy of start-up test and report form.
- C. Shop Drawings: Comply with requirements in Section 23 05 00.

PART 2 - PRODUCTS

2.1 SHEET METAL WORK, GENERAL

A. DUCT CONSTRUCTION

1. Comply with SMACNA.
2. Galvanized steel in general with G-90 zinc coating, ASTM A 653, minimum 26 gage.

B. FITTINGS

1. Comply with SMACNA as follows:
 - a. Rectangular Laterals: 45 degree entry fittings per SMACNA Figure 4-6.
 - b. Offsets: Full radius ($R/D=1.5$ for round and flat oval and $R/W=1.5$ for rectangular) where space allows. Mitered offset (Type 2) with 30 degree maximum offset angle per SMACNA Figure 4-7. Angle offset (Type 1) not acceptable.
2. Screened Openings: 1/2-inch mesh screen, 14 gage galvanized steel wire. Enclose mesh screen with 20 gage galvanized removable sheet metal frame around perimeter.

C. SOUNDLINED DUCTS

Fabricate with duct soundlining such that no gap will result between sections of duct lining after assembly of duct sections. Fabrication and installation shall result in adjacent soundlining sections butted together without gaps, bulges, or other discontinuities.

D. DUCT SEALANT, TRADITIONAL METHOD (CONTRACTOR OPTION)

1. Indoor Locations: UL 181 listed and labeled. Low odor, non-toxic vapors, surface burning characteristics for maximum flame spread of 25 and maximum smoke developed of 50 when in a dry state. Rated for air temperature range of minus 20 F to plus 150 F. Rated to 10-inch w.g., minimum 65 percent solid content. Foster® 32-19™ Duct-Fas, Childers CP-146 Chil-Flex™, McGill AirSeal LLC, United Duct Sealer™ (Water Based), Biddle Aqua-Crylic HVAC, Hardcast Iron-Grip 601, Design Polymeric DP1010, Ductmate Industries Inc. PROseal^{EZ} or EZseal™, or approved.

E. AEROSOL-BASED SEALING METHOD (CONTRACTOR OPTION)

Application performed by manufacturer trained and approved service provider. Sealant cured within 2 hours of application with no VOC off-gassing and remain elastic, UL 1381 listed. Mastic and fiberglass mesh tape used for repairing leaks UL 181 listed and labeled. Aeroseal, LLC, or approved. Apply sealant during unoccupied hours.

2.2 PLENUM CONSTRUCTION, FACTORY FABRICATED, FIELD ASSEMBLED

- A. Description: Acoustical plenum walls and appurtenances with inner wall solid face in general, and perforated as indicated on the Drawings.

B. CONSTRUCTION AND COMPONENTS

1. Panels: Minimum 3 inch thick, 4 inch thick at plug fans. Perforated panel sheets 22 gage galvanized steel with 3/32 inch diameter holes spaced on 3/16 inch staggered centers. Solid inner panel sheets 22 gage and solid outer panel 18 gage, galvanized steel.
2. Sound Retarding and Absorbing Fill: Incombustible, inert, mildew resistant and vermin-proof. Slightly larger and thicker than inside dimensions of panel, no voids.
3. Internal Panel Reinforcement: Minimum 18 gage galvanized steel and spaced such that span does not exceed 2' - 0". Perimeter and internal reinforcement and panel sheets

welded and riveted to form rugged metal-sheathed acoustical panel. Spot welds maximum 3 inch centers.

4. Face Sheet: Welded and riveted to panel assembly to compress and hold fill materials in place under severe conditions of vibration.
5. Door Panels: Solid 18 gage galvanized metal sides, 36 inch wide by 72 inch high, 4 inch thick, overlapping seal type, single continuous air/acoustic seals around sill, jambs, and head. Two hinges and 2 latches with inside release handle, assembled with hinge hardware attached and adjusted. Latches installed in field. Wedge lever type door latches with inside handles. Install doors to open against air pressure.
6. Roof Channels, Aprons, and Corner Joiners: 16 gage galvanized steel formed to prevent direct path for sound and/or air leakage. Panel joiners 20 gage galvanized steel, roll formed to be greater in strength than standard 16 gage joiners. Panel accessories furnished in standard lengths for field cutting to required dimensions.
7. Openings for Duct Connections: Provided by plenum manufacturer.
8. Pipe and Conduit Penetrations: Located and cut in field and sealed in accordance with manufacturer's instructions.
9. Plenum Structure: Self-supporting.
10. Finish: Metal surfaces galvanized.

C. PERFORMANCE

1. Transmission loss (TL) tested in accordance with ASTM E 90.
2. Absorption coefficients for composite panel assembly tested in accordance with ASTM C 423.
3. Heat Transfer Factor: K-value 0.07 Btu/hr/sq ft/F temperature difference of standard air.
4. Plenum installation capable of withstanding positive internal static air pressure of 6.0 inch w.g. and negative internal static air pressure of 3.0 inch.
5. Meet combustion requirements established by ASTM E 84, not exceeding the following:
 - a. Flame Spread of 25.
 - b. Smoke Developed of 50.
- D. Manufacturers: Industrial Acoustics Company "BIG-H PLENUM", Rink Acoustics, Semco, McGill AirSilence LLC Uni-Housing™ Enclosures, Vibro-Acoustics, or approved.

2.3 DUCT SOUNDLINING, NON-FIBERGLASS

- A. Description: Non-fiberglass acoustical and thermal insulation, 1 inch thick unless noted otherwise on the Drawings.
- B. Standards and Ratings: ASTM C 1534, NFPA 90A, and NFPA 90B, and UL 181 for preformed duct coverings and linings. K-value 0.25 Btu/hr/sq ft/F at 75°F mean temperature per ASTM C 177 or ASTM C 518.

C. COMPOSITION

1. Fiber-free, formaldehyde-free, low VOCs, non-particulating, closed cell structure with Microban® antimicrobial product protection per ASTM G 21 and ASTM C 1338. Composite surface burning characteristics for maximum flame spread of 25 and maximum smoke developed of 50 per ASTM E 84, NFPA 255, and UL 723. Type I closed cell EPDM elastomeric duct soundlining acceptable.

2. Temperature limit 180°F per ASTM C 411.
3. Velocity rated for erosion resistance to 10,000 fpm per ASTM C 1071.
- C. Duct Soundlining Adhesive: Pressure sensitive adhesive system for non-pinned field applications. ASTM C 916.
- D. Manufacturers: Armacell® AP Armaflex® SA Duct Liner for 1 inch thickness, Armacell® AP Armaflex® FS SA Duct Liner for 1-1/2 and 2 inch thicknesses, Armacell® AP Spiraflex Spiral Duct Liner for 1 inch thickness, Armacell® AP Coilflex™ Duct Liner for 1 inch thickness, Ductmate Industries Inc. PolyArmor™, Aeroflex USA, Inc. Aerocel AC, or approved.

2.4 FASTENERS

- A. Description: Use blind rivets, sheet metal screws, or bolted connections where required by SMACNA for attachment purposes for sheet metal. Sheet metal screws and rivets minimum length required for secure fastening. Where rivets are specifically called for in this section, sheet metal screws may be used.
- B. Locations: For ducts, grilles, and accessories exposed to view in finished rooms, include finish-type fasteners.
 1. Permanent Work: Blind stainless steel pop rivets.
 2. Removable Items and Grilles: Cadmium-plated pan head or countersunk tapping screws.

2.5 HANGERS FOR SHEET METAL WORK

- C. Description: Hangers, supports, and anchor bolts for sheet metal work and equipment, same material as for duct construction.
- D. Building Attachments: Concrete inserts and structural-steel fasteners appropriate for construction materials to which hangers are being attached. Comply with requirements in Section 23 05 10.
- E. Duct Sizes: Refer to maximum cross-section dimension at location of hangers.
- F. Horizontal Rectangular Ducts: Comply with SMACNA. Wire hangers not acceptable.
- G. Contractor's Option for Horizontal Rectangular Ducts: Adjustable cable hanging system tested and certified to comply with SMACNA for upper and lower attachment methods. System consists of matching components including steel cables, spring loaded, serrated clamping mechanism, and miscellaneous hardware selected for its corresponding load rating. Ductmate Industries Inc. Clutcher Cable Hanging System, Gripple Hang-Fast Duct Hanging System, or approved.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Description: Verify installation conditions as satisfactory to receive the Work of this section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 PREPARATION

- A. Field Measurements: Field verify locations of new and existing work prior to commencing the Work of this section.

- B. Protection: Protect surrounding areas and surfaces to preclude damage from the Work of this section.

3.3 INSTALLATION, APPLICATION, ERECTION, AND PERFORMANCE

- A. General: Install, apply, erect, and perform the Work in accordance with Article "Quality Assurance", provisions, specifications, and manufacturer's installation instructions and directions. Where these may be in conflict, the more stringent requirements govern.
- B. Do not cover up or enclose work until inspected and approved. If in non-compliance, uncover work, remove, and provide new to satisfaction of the A/E at no additional cost to the Owner.

3.4 DUCT INSTALLATION

A. GENERAL

1. Install in workmanlike manner. Fabrications, fittings, joints, take-offs, attachments, turning vanes, dampers, and sealing in accordance with requirements of SMACNA as specified in this section and as indicated on the Drawings. If used as part of duct fabrication process, install duct labels on outside of ductwork. Installation of duct labels on inside of duct not acceptable.
2. Comply with requirements in Section 23 05 48 for seismic restraints of ducts and for penetrations through mechanical room walls and floors and acoustical walls.
3. Hang ducts from roof structure and not from the roof deck itself. Provide formed steel channels or supplementary steel framing as specified in Section 23 05 10 to span between roof structural members.
4. Locate ducts with sufficient clearance around equipment to allow for inspection, repair, replacement, and service.
5. Cap incomplete duct ends with temporary closures of taped polyethylene to prevent construction dust from entering ducts.
6. Install duct collars where exposed ducts pass through non-fire rated walls and ceilings. Fasten tight to ducts.
7. Duct sizes may be changed as long as the new dimensions are equivalent to those indicated and do not exceed 4 to 1 aspect ratio.
8. Transitions:
 - a. Fabricate and install duct transitions for connections to equipment, such as fans, where the connection sizes are different from duct sizes indicated on the Drawings.
 - b. Where transitions are required to fit into available space, fabricate to maintain equivalent free area of duct sizes with angle less than 15 degrees.
9. Drawings do not show offsets which may be required. Make offsets with fittings with as small an angle of offset as possible. Install turning vanes in square corner elbows.
10. Install ducts within shafts without contact with walls.
11. Install ducts, unless otherwise indicated on the Drawings, vertically and horizontally and parallel and perpendicular to building lines.
12. Install test holes at fan inlets and outlets and elsewhere as indicated on the Drawings. Locate where required for testing and balancing purposes as directed by the TAB subcontractor specified in Section 23 05 93.

- B. Duct and Plenum Sealing, Traditional Method (Contractor Option): SMACNA Seal Class A. Apply duct sealer to transverse joints, longitudinal seams, fitting connections, corners of four-bolt or corner clip duct connection system, and fitting seams except continuous welded type. Spiral seams, continuous welded seams, and transverse joints for 4-bolt or corner clip duct connection system are not required to be sealed unless visible and audible leaks exist or duct leakage exceeds that allowed by leakage test specified in this section. Comply with manufacturer's recommendations.
- C. Duct and Plenum Sealing, Aerosol-Based Sealing Method (Contractor Option):
1. Preparation:
 - a. Inspect air distribution systems for leakage sites and accumulation of dust and debris. Remove debris and dust and dirt greater than 1/8 inch thick.
 - b. Coordinate with other subcontractors to temporarily remove or protect control devices and fire and smoke detectors from aerosol particles as required by aerosol manufacturer.
 - c. Temporarily disable fire alarm devices and notify the AHJ.
 - d. Temporarily isolate air distribution equipment and cover air devices and similar items as required by aerosol manufacturer.
 - e. Protect occupied spaces from aerosol particles.
 2. Duct Sealing
 - a. Repair major leakage locations greater than 1/2 inch wide using mastic and fiberglass mesh tape per SMACNA.
 - b. Seal ducts internally using automated aerosolized sealant injection.
 - c. Prepare pre-sealing, post-sealing, and sealing profile reports for duct sections sealed.
 - d. Repair injection and test holes per SMACNA.
 3. Duct Re-assembly and Cleanup:
 - a. Coordinate with other subcontractors to reinstall control devices and fire and smoke detectors.
 - b. Coordinate with other subcontractors to enable fire alarm devices and notify the AHJ.
 - c. Remove isolation for air distribution equipment and remove covers from air devices and similar items and enable air distribution equipment.
 - d. Cleanup sealant residue from surfaces in occupied spaces.

3.5 DUCT SOUNDLINING, NON-FIBERGLASS

- A. General: Install duct soundlining per manufacturer's requirements. Install sheet metal nosings at leading edge of lining when air stream velocity exceeds 4,000 fpm. Duct dimensions indicated on the Drawings are net inside dimensions. Increase sheet metal dimensions to accommodate duct soundlining thickness.

B. EXTENT

1. Soundline entire supply air plenum between fan-wall and existing supply air duct, except floor of plenum where service access is required for maintenance of fan-wall.

C. TRANSPORTATION AND HANDLING

1. Transport and handle in accordance with manufacturer's instructions.

2. Promptly inspect shipments to ensure that materials comply with requirements and are undamaged.
3. Provide equipment and personnel to handle materials by methods to prevent soiling, disfigurement, or damage.
4. Clean sheet metal surfaces prior to duct lining application per manufacturer's instructions.

D. STORAGE AND PROTECTION

1. Store and protect in accordance with manufacturers' instructions.
2. Store with seals and labels intact and legible.
3. Store in weathertight, climate controlled enclosures in an environment favorable to materials.
4. Exterior storage not acceptable.
5. Use off-site storage and protection when site does not permit on-site storage or protection.
6. Use equipment and personnel to store materials by methods to prevent soiling, disfigurement, or damage.
7. Arrange storage of materials to permit access for inspection. Periodically inspect to verify materials are undamaged and are maintained in acceptable condition.

E. PROTECTION OF INSTALLED WORK:

1. Provide temporary and removable protection for installed soundlining. Use durable sheet materials.
 2. Control activity in immediate work area to prevent damage.
 3. Install protective coverings at openings.
 4. Prohibit traffic or storage upon installed surfaces.
- F. Installation: For soundlined ducts, use care during installation to insure that soundlining remains clean and dry, and that no gap will result between sections of duct soundlining after assembly of duct sections. For multi-layer applications, stagger seams. Installation shall result in adjacent soundlined sections butted together without gaps, bulges, or other discontinuities. Ensure that mating edges are sealed in the field.

3.6 HVAC SYSTEMS TRAINING

- A. Comply with requirements in Section 23 08 10.

3.7 COMMISSIONING

- A. Equipment and systems referenced in this section shall be commissioned per Section 23 08 00. The Contractor has specific responsibilities for scheduling, coordination, test development, testing and documentation.

END OF SECTION

SECTION 23 33 00 AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Turning Vanes
- B. Flexible Connections
- C. Duct Access Doors
- D. Control Dampers
- E. Flange Connectors

1.2 RELATED SECTIONS

- A. Division 23 - HVAC

1.3 QUALITY ASSURANCE

- A. Construction and installation of all duct accessories shall comply with SMACNA HVAC Duct Construction Standards, 1st Edition.

1.4 CONTRACTOR SUBMITTALS

- A. Submittals shall comply with Section 01 30 10 – Submittals and Show Drawings.

B. PRODUCT DATA

- 1. Submit product information on all items to be used.

1.5 REFERENCES

- A. SMACNA HVAC Duct Construction Standards, 1st Edition.
- B. NFPA 90A: Standard for the Installation of Air Conditioning and Ventilating Systems.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Products shall comply with Section 23 05 00.
- B. Flexible Connections: VentFabrics, Duro-Dyne.
- C. Duct Access Doors: National Controlled Air, VentFabrics, United-McGill, Air Balance, Kees, Ruskin, Vent Products.

2.2 CONTROL DAMPERS

- A. Note: Dampers not provided with equipment are to be by Mechanical Contractor.

B. MANUFACTURERS

Subject to compliance with requirements, available manufacturers, offering products that may be incorporated into the Work include, but are not limited to, the following:

- 1. Greenheck Fan Corporation.
- 2. Ruskin Company
- 3. Or Approved
- C. Low-leaking rating, with linkage outside airstream, and bearing AMCA's Certified Ratings Seal for both air performance and air leakage.

1. Hat or Angle shaped.
2. Galvanized or Stainless-steel channels, 0.064-inch (1.62-mm) thick.
3. Mitered corners.

D. BLADES

1. Multiple blade with maximum blade width of 8-inches (200mm).
2. Parallel- and opposed-blade design.
3. Galvanized or Stainless steel.
4. 0.064-inch (1.62-mm) thick.
5. Blade Edging: Closed-cell neoprene edging.
6. Blade Edging: Inflatable seal blade edging, or replaceable rubber seals.

E. BLADE AXLES

1. 1/2-inch (13-mm) diameter, galvanized steel, stainless steel or nonferrous metal; blade linkage hardware or zinc-plated steel and brass; ends sealed against blade bearings.
2. Operating Temperature Range: From minus 40 to 200°F (minus 40 to plus 93°C).

F. BEARINGS

1. Oil-impregnated bronze.
2. Dampers in ducts with pressure classes of 3-inch w.g. (750 Pa) or less shall have axle's full length of damper blades and bearings at both ends of operating shaft.
3. Thrust bearings at each end of every blade.

2.3 TURNING VANES

- A. Turning vanes may be either contractor or factory fabricated.
- B. Vanes and runners shall be fabricated of minimum 24 gauge galvanized.
- C. Turning vanes shall comply with SMACNA HVAC Duct Construction Standards. For duct widths less than 19-inches, vanes may be single wall construction; for widths greater than 19-inches, vanes shall be double wall "airfoil" type.
- D. Turning vanes shall be equally spaced, parallel to each other, and securely attached to runners.
- E. For elbows where the inlet and outlet dimensions are not the same, modify vane shape or angle to provide optimum turning.

2.4 FLANGE CONNECTORS

A. MANUFACTURERS

Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work Include, but are not limited to, the following:

1. Ductmate Industries, Inc.
 2. Nexus PDQ; Division of Shilco Holdings Inc.
 3. Ward Industries, Inc.; a division of Hart & Cooley, Inc.
- B. Description: Add-on or roll-formed, factory fabricated, slide-on transverse flange connectors, gaskets, and components.

- C. Material: Galvanized steel.
- D. Gauge and Shape: Match connecting ductwork.

2.5 FLEXIBLE CONNECTIONS

- A. Material shall be flexible glass fiber fabric with an inorganic elastomeric
- B. Material shall be flame retardant and comply with requirements of NFPA-90A.

2.6 DUCT ACCESS DOORS

- A. Access doors shall be of double wall construction, made with minimum 24 gauge galvanized steel, tight fitting, with sealing gasket, and cam locks (or may be hinged type with latches).
- B. Access doors shall be of sufficient size so that items concealed in duct can be serviced and inspected, and shall be adequately sized to allow complete removal of the item being served (where removal cannot be made without disturbing fixed ductwork).
- C. Doors shall be minimum 14-inches x 14-inches. Where duct size will not accommodate this size door, the doors shall be made as large as practicable.
- D. Doors larger than 14-inches x 14-inches shall have a minimum of four (4) cam locks (or where hinged type is used, have a minimum of two (2) latches).
- E. Doors in insulated ducts shall be insulated type, with minimum 1-inch thick fiberglass insulation.
- F. Round ducts shall use either lined rectangular tap off with insulated rectangular access door or curved insulated access door (for insulated duct); or curved type uninsulated access door (for uninsulated duct).

PART 3 - EXECUTION

3.1 TURNING VANES

- A. Install turning vanes in all square duct turns, and at locations shown on the drawings.
- B. Securely attach turning vane runners to ductwork.

3.2 FLEXIBLE CONNECTIONS

- A. Provide flexible connections at all duct connections to fans, where ducts of dissimilar metals are connected, and where shown on the drawings.
- B. For round ducts, the flexible material shall be secured by zinc-coated, iron clinch type draw bands.
- C. For rectangular ducts, the flexible material shall be locked to metal collars which shall be connected to the duct using normal duct seam construction methods.
- D. Install flexible connections with sufficient slack to permit 2-inches of horizontal or vertical movement of ducts or equipment at flexible connection point without stretching the flexible material.
- E. Where installed exposed to outside weather, provide a galvanized "hat" channel protecting top and vertical stretches of flexible connection point without stretching the flexible material.

3.3 DUCT ACCESS DOORS

- A. Provide duct access doors at all automatic control dampers, fire/smoke dampers, duct control devices, filters, and any other components in the duct system that require service or inspection.
- B. Provide duct access doors at all louver plenums, and at the top of all vertical duct runs that exceed ten feet.
- C. Access doors shall be of sufficient size and so located so that the concealed items may be serviced and inspected or completely removed and replaced.

3.4 FIELD QUALITY CONTROL

A. TESTS AND INSPECTIONS:

- 1. Operate dampers to verify full range of movement
- 2. Inspect locations of access doors and verify that purpose of access door can be performed.
- 3. Inspect turning vanes for proper and secure installation.
- 4. Operate remote damper operators to verify full range of movement of operator and damper.

END OF SECTION

SECTION 23 34 00 – AIR DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes fan array fans, fan array controller, and associated appurtenances.
- 1. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 sections apply to the Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.

B. CODES AND STANDARDS

- 1. AHRI 410, Forced-Circulation Air-Cooling and Air-Heating Coils.
- 2. AMCA Publication 99, Standards Handbook.
- 3. AMCA Standard 204, Balance Quality and Vibration Levels for Fans.
- 4. AMCA Standard 210, Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
- 5. AMCA Publication 211, Certified Ratings Program – Product Rating Manual for Fan Air Performance.
- 6. AMCA 300, Reverberant Room Method for Sound Testing of Fans.
- 7. AMCA Standard 301, Methods for Calculating Fan Sound Ratings from Laboratory Test Data, as tested to AMCA 300.
- 8. AMCA Publication 311, Certified Ratings Program – Product Rating Manual for Fan Sound Performance.
- 9. AMCA Standard 320, Laboratory Methods of Sound Testing of Fans Using Sound Intensity.
- 10. AMCA Standard 500-D, Laboratory Methods of Testing Dampers for Rating.
- 11. AMCA Publication 511, Certified Ratings Program – Product Rating Manual for Air Control Devices.
- 12. ARI 260, Sound Rating of Ducted Air Moving and Conditioning Equipment.
- 13. ARI 430, Central Station Air-Handling Units.
- 14. NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.
- 15. UL 507, Standard for Electrical Fans.
- 16. UL 705, Power Ventilators.
- 17. UL 723, Standard for Test for Surface Burning Characteristics of Building Materials.
- 18. UL 1995, Heating and Cooling Equipment.

1.3 SUBMITTALS

- A. Comply with requirements in Division 01 and Section 23 05 00.

1. Product Data: Submit manufacturer's technical product data, ladder-type wiring diagrams differentiating between portions of wiring that are factory installed and portions to be field-installed, and maintenance data for each air handling unit as follows: Include dimensions, weights, capacities, certifications, component performance, electrical characteristics, casing construction details, wiring interconnections, gages, and finishes of materials.
1. Plenum fans with interlocking bulkhead wall panels for fan array.
2. Fan array controller. Including wiring diagrams with component equipment list referencing part model numbers.
3. Blank copy of start-up and test report form.
- C. Performance Data: Submit fan performance curve for each fan. Indicate on separate graph for each fan and for combined fans operating in parallel, static pressure versus volume flow, efficiency, and brake horsepower, with scheduled design point shown and labeled. Indicate that fan performance curve will not exceed 90 percent of maximum efficiency. Performance certified in accordance with AMCA 210. A single fan curve not acceptable. Include coil selection worksheets, showing consideration for altitude, air density, fluid characteristics, and fouling factor.

D. TEST REPORTS

1. Field start-up test reports.
2. Submit completed copy of reports and include copy in the Operation and Maintenance Manual.

E. SOUND POWER LEVEL DATA

1. Submit data plotting octave band frequencies from 63 Hz to 8000 Hz versus octave band sound power level, dB re: 10 – 12 Watt, for unit discharge and inlet. Performance certified in accordance with AMCA 300 and ARI 260.

PART 2 - PRODUCTS

2.1 PLENUM FANS

- A. Description: Unhoused, centrifugal type, direct drive as indicated on the Drawings. Tested, rated, and certified in accordance with AMCA 210 for air delivery and AMCA 300 for sound power levels. Fan balancing process, including vibration limits and documentation performed per AMCA 204. Include AMCA label. Factory tested at scheduled fan RPM.

B. CONSTRUCTION

1. Class per AMCA Publication 99 for air quantity and static pressure as scheduled, steel framework, bearing support structure, and inlet panel, AMCA Arrangement 4 for direct drive.
2. Wheel: Non-overloading, backward inclined with airfoil blades, aluminum, statically and dynamically balanced.
3. Bearings: Self aligning ball or roller pillow block type, L-50 life at 200,000 hours, grease lubricated.
4. Finish: Steel components finished with electrostatically applied backed polyester urethane powder coating.
- C. Motor: ECM direct drive, comply with requirements in Section 23 05 13.
- D. Fan Drives: Comply with Article "Fan Drives" in this section.

- E. Guard: Include OSHA approved metal fan blade guard having sides of galvanized steel and expanded metal or wire face with openings to prevent finger injury. Include OSHA approved inlet screen.
- F. Vibration Isolation Mountings and Seismic Restraints: Internal isolation. Fan, motor, and drive isolated from casing and factory-mounted on welded steel isolation base with seismically restrained spring isolators. Base mounted on fan section channel base. Comply with requirements in Section 23 05 50 for seismic restraints.
- G. Manufacturers: Q-PAC
 - 1. Must be an authorized distributor or branch office of manufacturer specified.
- H. Provide with the following additional components for a complete fan array system:
 - 1. Single point power panel with disconnect switch, keyed HOA switch, speed controller for manual override mode, and lockable enclosure.
 - 2. Fan array with fan manufacturer designed interlocking bulkhead wall.
 - 3. Fan quick connect panel(s) for quick connection of fan electrical whips and interface with single point power panel. Each connection point shall be labeled to match corresponding fan label.
 - 4. Six (6) fan blank-off plates for isolation of inactive fan.
 - 5. Provide two (2) additional ECM direct drive fans with all required quick connects and necessary hardware for ease of installation.
 - 6. BACnet compatible "premium" controller for remote interface with system operation and to allow connection to and communication with BAS.
 - 7. The manufacture shall include in their control and/or electrical design to provide a control system that will be able to bypass the main controller if it fails. The fans shall still be active to maintain building air supply during a failure. Provide electrical line diagrams for approval prior to fabrication. The intent is to maintain building air supply during a failure. Provide electrical line diagrams for approval prior to fabrication. The intent is to maintain building airflow during fault conditions. Providing a secondary replacement controller fully programed for quick replacement may be considered as a backup option if no other options are available.

PART 3 - EXECUTION

3.1 INSPECTION

- A. General: Verify installation conditions as satisfactory to receive the Work of this section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 PREPARATION

- A. Field Measurements: Field verify locations of new and existing work prior to commencing the Work of this section.
 - 1. Protection: Protect surrounding areas and surfaces to preclude damage from the Work of this section.

3.3 INSTALLATION, APPLICATION, ERECTION AND PERFORMANCE

- A. Description: Install, apply, erect, and perform the Work in accordance with Article "Quality Assurance" provisions, specifications, and manufacturer's installation instructions and directions. Where these may be in conflict, the more stringent requirements govern.

1. Coordinate with ductwork and piping as necessary to interface installation of air handling equipment and access to components.
2. Coordination: Coordinate required electrical and control installation work with Division 26 and Section 23 09 00.

3.4 WORK PRIOR TO INSTALLATION

- A. Equipment manufacturer's authorized representative shall maintain personnel within a 50 mile radius of job site. Representative capable of troubleshooting air handling unit faults.
 1. Include one (1) man day to meet with mechanical, electrical and control subcontractors and mechanical engineer at job site. Schedule this meeting within one (1) week after equipment is delivered to final location at job site but prior to equipment operation. Purpose is to assure that all parties understand what interconnections are required.
 2. After equipment installation, include one (1) man day to assist control and electrical subcontractors in termination of interconnecting wires in unit mounted control panels. This service shall also verify proper connection and polarity of wires.

3.5 INSTALLATION OF AIR HANDLING EQUIPMENT AND COMPONENTS

- A. Install equipment with clearances for service and maintenance.
 1. Floor /Wall Mounted Fans: Install fans on equipment frames, refer to drawings. Comply with requirements in Section 23 05 50 for seismic restraints.
 2. Air Measuring Units: Install units furnished under Section 23 09 00.

3.6 CLEANING

- A. Air handling equipment shall remain sealed except during installation. When daily activities have been completed, clean and seal unit. Do not use compartments for storage.
 1. Thoroughly clean plenums and casings of debris and blow free small particles of rubbish and dust before making final duct connections. Prior to startup, clean to remove traces of oil, dust, and dirt. Vacuum clean fan wheels, exterior surfaces of casings, and entering air face of coils.

3.7 START-UP SERVICES

- A. Equipment manufacturer's authorized representative shall perform start-up services of air handling units and related appurtenances. Services shall include a check of proper installation, system check-out, adjustment, and complete start-up. Start-up by Contractor not acceptable.
 1. After control and electrical contractor provides final termination and have been approved for startup, include one (1) day for startup and preliminary commissioning and testing.
 2. After existing fan has been demoed and sheet metal transitions installed, include one (1) day for final commissioning and testing.
- B. Coordinate start-up services with air distribution system operation as specified in Division 01 and Section 23 05 00 and TAB work specified in Section 23 05 93.

3.8 ADJUSTING

- A. Adjust fans to deliver design airflow. Comply with requirements in Section 23 05 93.
 1. Lubricate bearings with oil or grease as recommended by manufacturer.

3.9 HVAC SYSTEMS TRAINING

- A. Comply with requirements in Section 23 08 10.
- B. Representative shall conduct one (1) four (4) hour training sessions to demonstrate that equipment operates as indicated in the Contract Documents and in accordance with manufacturer's recommendations. First session shall cover operation of air handling equipment. Second session shall cover detailed system operation and trouble shooting. Give minimum one (1) week notice prior to demonstration. Furnish instruments and personnel required to conduct the demonstration.
- C. Starting time (during any normal operating shift) of training sessions will be determined by the Owner to minimize overtime required for his maintenance personnel.
- D. Demonstrate proper performance of operating and safety controls, as well as stable equipment performance over entire operating range to satisfaction of the Owner prior to Substantial Completion.
- E. Include instruction session to identify locations of servicing points and required maintenance requirements to Owner's personnel.
- F. Include preliminary discussion and presentation of information from instruction manuals, with appropriate references to the Contract Documents, followed by tour explaining maintenance requirements, access methods, servicing and maintenance procedures, equipment cleaning procedures, control settings and available adjustments.

3.10 COMMISSIONING

- A. Equipment and systems referenced in this section shall be commissioned per Section 23 08 00. The Contractor has specific responsibilities for scheduling, coordination, test development, testing and documentation.

END OF SECTION

SECTION 23 41 00 - FILTERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Description: The Work includes air filters for air handling equipment and associated appurtenances.
- B. General Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 sections apply to the Work in this section.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable city, county, and state codes and ordinances.

B. CODES AND STANDARDS

- 1. ASHRAE 52.2 Method of Testing General Ventilation Air--Cleaning Devices for Removal Efficiency by Particle Size.
- 2. NFPA 90A, Standard for the Installation of Air--Conditioning and Ventilating Systems.
- C. UL 900, Standard for Air Filter Units.

1.3 SUBMITTALS

- A. Comply with requirements in Division 01 and Section 23 05 10.
 - 1. Product Data: Submit manufacturer's technical product data and maintenance data for the following:
 - 1. Replaceable filters.
 - 2. Final filters.
 - 3. Filter housings and frames.
 - 4. Resistance indicator.
 - 5. Filters during construction.
 - 6. Blank copy of start--up and test report forms.

C. TEST REPORTS

- 1. Start--up and test reports.
- 2. Submit completed copy of reports and include in the Operations and Maintenance Manual.
- D. Certification: Submit certificate signed by the Owner as to receipt of spare filters.

1.4 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Section 23 33 00 – Air Distribution Accessories: Filters during construction.

1.5 SPARE MEDIA

- A. For Air Handling System: Two sets. One for initial installation, installed prior to TAB work specified in Section 23 05 93, and one delivered to the Owner at Substantial Completion.

PART 2 - PRODUCTS

2.1 REPLACEABLE FILTERS

- A. Pleated V-Bank Air Filter: Tapered self-supporting pleated pockets, 100% synthetic media in self-supporting frame, MERV 13 per ASHRAE 52.2, 2 as evaluated under Appendix J, twelve (12) inch thick, UL 900.
 - 1. Manufacturers: Airguard V-Force or approved.

2.2 FINAL FILTERS

- A. Pleated V-Bank Air Filter: Tapered self-supporting pleated pockets, 100% synthetic media in self-supporting frame, MERV 13 per ASHRAE 52.2, 2 as evaluated under Appendix J, twelve (12) inch thick, UL 900.
 - 2. Manufacturers: Airguard V-Force or approved.

2.3 FILTER HOUSINGS AND FRAMES

- A. Existing filter frames will be removed and re-installed on new fan-wall and filter support frame. Refer to drawings. If due to fabrications fan support structure requires excessive fabrication to make the existing filter frame to new structure the contractor shall fabricate new filter racking and frames.

2.4 RESISTANCE INDICATOR

- A. General: Diaphragm--actuated dial type, 4-3/4 inch outside diameter with white dial, black figures and graduations, and pointer zero adjustment, 0 to 1 inch w.g. range with 0.02 inch minor division. Accuracy plus or minus 2 percent of full scale at 70°F. Include bracket, static pressure taps, aluminum tubing, and vent valves.
Manufacturer: Dwyer® Magnehelic® Model 2001 or approved.

PART 3 - EXECUTION

3.1 INSPECTION

- A. General: Verify installation conditions as satisfactory to receive the Work of this section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 PREPARATION

- A. Field Measurements: Field verify locations of new and existing work prior to commencing the Work of this section.
- 3. Protection: Protect surrounding areas and surfaces to preclude damage from the Work of this section.

3.3 INSTALLATION, APPLICATION, ERECTION, AND PERFORMANCE

- A. General: Install, apply, erect, and perform the Work in accordance with Article "Quality Assurance" provisions, specifications, and manufacturer's installation instructions and directions. Where these may be in conflict, the more stringent requirements govern.
- 4. Coordinate with ductwork and air moving equipment as necessary to interface installation of and access to filters.
- 5. Install filters in proper position to prevent passage of unfiltered air.

6. Install resistance indicator static pressure taps upstream and downstream of filters to indicate air pressure drop through air filter. Install indicator on outside of filter housing or filter plenum in accessible and readable position.

3.4 HVAC SYSTEMS TRAINING

- A. Comply with requirements in Section 23 08 10.

3.5 COMMISSIONING

- A. Equipment and systems referenced in this section shall be commissioned per Section 23 08 00. The Contractor has specific responsibilities for scheduling, coordination, test development, testing and documentation.

END OF SECTION

1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE DRAWINGS, SPECIFICATIONS, AND THE CODES, RULES AND REGULATIONS OF THE INTERNATIONAL BUILDING CODE, 2018 EDITION, AS AMENDED BY THE STATE OF WASHINGTON AND THE CITY OF TACOMA. BASIS OF DESIGN CODES: ASCE 7-16 MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA AND OTHER STRUCTURES

2. DESIGN LOADS:
FAN WEIGHT: 150 POUNDS PER
FILTER WEIGHT: 10 POUNDS PER SQUARE FOOT
LIVE LOADS: 10 POUNDS PER SQUARE FOOT AIR PRESSURE DIFFERENTIAL
SEISMIC DESIGN: SDS=1.090g, IMPORTANCE FACTOR, IP=1.5, AP=2.5, RP=6.0

3. STEEL MATERIALS:
 ANGLES, CHANNELS AND ROUNDS: ASTM A36
 STRUT CHANNEL: HILTI MI SYSTEM AND COMPONENTS
 CONNECTION BOLTS: ASTM A307, OR SAE GRADE 5
 COLD FORM GAUGE MATERIAL: AISI S100 MATERIAL WITH YEILD STRENGTH OF 33 KSI MINIMUM
 SHEET METAL SCREWS: ASTM A510 GRADE 1018-1022

STRUCTURAL STEEL DETAILING, FABRICATION AND ERECTION SHALL BE BASED ON THE LATEST EDITION AND SUPPLEMENTS OF THE AISC "DESIGN SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".

ALL WELDS SHALL BE PREQUALIFIED IN CONFORMANCE WITH AISC AND AWS STANDARDS AND SHALL BE PERFORMED BY WELDERS CERTIFIED IN THE JURISDICTION HAVING AUTHORITY. USE E70XX ELECTRODES FOR STRUCTURAL STEEL AND E60XX ELECTRODES FOR COLD FORMED SHEET METAL "GAUGE" STEEL. WELD LENGTHS CALLED FOR ON THE PLANS ARE THE NET EFFECTIVE LENGTH REQUIRED. WELD SIZE SHALL BE AISC MINIMUM, UNLESS OTHERWISE NOTED. WELDING OF STRUCTURAL STEEL PER AWS D1.1, SHEET METAL SHALL BE PER AWS D1.3.

4. CONCRETE ANCHORS
HILTI KWIK BOLT – TZ ANCHORS INSTALLATION AND SPECIAL INSPECTION PER ICC-ES 1917
DIAMETER 1/2"
DRILLED HOLE DEPTH 2-3/4"
EFFECTIVE EMBEDMENT 2"

5. SPECIAL INSPECTION SHALL BE REQUIRED FOR THE FOLLOWING TYPES OF WORK:
FIELD WELDING
POST-INSTALLED CONCRETE ANCHORS

6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. THE STRUCTURAL ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.

7. IF ANY ERRORS OR OMISSIONS APPEAR IN THESE DRAWINGS, SPECIFICATIONS, OR OTHER DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OR CIVIL ENGINEER IN WRITING OF SUCH OMISSION OR ERROR BEFORE PROCEEDING WITH THE WORK.

8. NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NOTES AND DETAILS ON DRAWINGS AND THESE GENERAL NOTES AND TYPICAL DETAILS ARE IN CONFLICT WITH THE PROJECT SPECIFICATIONS, THE MOST STRINGENT SHALL APPLY. CONDITIONS NOT SPECIFICALLY SHOWN SHALL BE CONSTRUCTED AS SHOWN FOR SIMILAR WORK, SUBJECT TO REVIEW BY THE CIVIL AND STRUCTURAL ENGINEER.

9. MANUFACTURED MATERIALS SHALL BE APPROVED BY THE CHECKING AGENCY PRIOR TO THEIR USE. ALL REQUIREMENTS OF THOSE APPROVALS SHALL BE FOLLOWED.

10. ALL STRUCTURAL SYSTEMS THAT ARE TO BE COMPOSED OF MANUFACTURED COMPONENTS TO BE FIELD ERRECTED SHALL BE APPROVED BY THE CHECKING AGENCY PRIOR TO THEIR USE AND SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE, AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.

11. FRAMING MEMBERS, WHICH ARE NOT DIMENSIONED, SHALL BE EQUALLY SPACED BETWEEN DIMENSIONED POINT OR MEMBERS.

12. COORDINATE THESE STRUCTURAL SUPPORTS WITH MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS AND PROJECT SPECIFICATIONS.

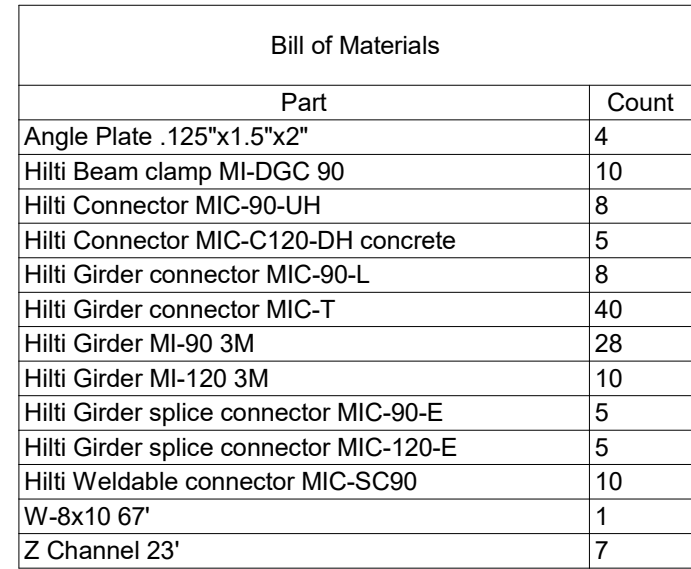
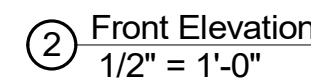
13. THE CONTRACT DOCUMENTS REPRESENT THE FINISHED STRUCTURE; THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.

14. SPECIFICATIONS, CODES, AND STANDARDS NOTED IN THE CONTRACT DOCUMENTS SHALL BE OF THE LATEST APPROVED ISSUE, INCLUDING SUPPLEMENTS, UNLESS OTHERWISE NOTED. MATERIAL SPECIFICATIONS ARE ASTM LATEST EDITION.

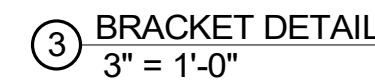
15. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR THE STRUCTURE AND STRUCTURAL COMPONENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

16. CONTRACTOR SHALL SCHEDULE AND COORDINATE ALL MATERIAL TESTING AND SPECIAL INSPECTIONS, TO BE PERFORMED BY AN INDEPENDENT AGENCY APPROVED BY THE OWNER. ALL THIRD PARTY STRUCTURAL TEST, INSPECTION OR OBSERVATION REPORTS REQUIRED BY THESE CONTRACT DOCUMENTS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD WITHIN SEVEN (7) CALENDAR DAYS OF THE DATE OF SAID TEST, INSPECTION OR OBSERVATION. THE ENGINEER OF RECORD SHALL BE NOTIFIED IMMEDIATELY OF ANY DEFICIENCY OR DEVIATION FROM THE CONTRACT DOCUMENTS.

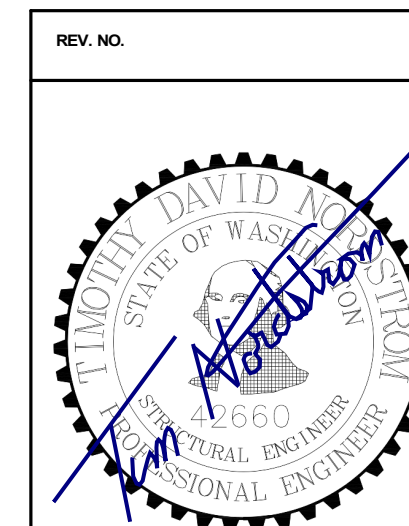
17. CONTRACTORS OPTION:
ALTERNATE CONSTRUCTION METHOD OR MATERIAL MAY BE PROPOSED BY THE CONTRACTOR. ALL PROPOSALS SHALL INCLUDE ENGINEERING DESIGN STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF WASHINGTON. WRITTEN APPROVAL BY THE ENGINEER OF RECORD IS REQUIRED PRIOR TO GOING FORWARD WITH ANY ALTERNATE CONSTRUCTION MATERIALS OR DESIGNS.



① FAN WALL ISOMETRIC VIEW



FOR BID



CITY OF TACOMA			
DEPARTMENT OF PUBLIC UTILITIES			
LIGHT DIVISION			
ADMINISTRATION BUILDING NORTH			
MECHANICAL ROOM			
FAN MODIFICATION			
PLAN & ISOMETRIC VIEW			
REVIEWED		DESIGNED	DRAWN Author
		Issue Date	STAMPED
		DATE	Approver
APPROVED		DRAWING NO.	
		20.5.S1.0	

GENERAL

	EXISTING MECHANICAL TO BE REMOVED
	EXISTING MECHANICAL TO REMAIN
	NEW MECHANICAL WORK
	MATCHLINE OR PROPERTY LINE
	ENLARGED PLAN BOUNDARY
	DETAIL/PLAN IDENTIFIER
	SECTION IDENTIFIER
	FLAG NOTE CALLOUT
	DEMOLITION NOTE TAG
	MECHANICAL EQUIPMENT TAG
	NORTH ARROW
	LOCATION WHERE PICTURE WAS TAKEN AND DIRECTION
	INVERT ELEVATION OR POC

ELECTRICAL PROVISIONS FOR MECHANICAL WORK

	LOCATION OF STARTER, DISCONNECT & CONTROLS
	VARIABLE FREQUENCY DRIVE
	HEAT TRACE BETWEEN SYMBOLS OR END OF RUN

ACCESS, EXCAVATION, AND BACKFILLING

	ACCESS DOOR (SPECIFIED OR AS SHOWN ON DWGS)
	MECHANICAL ACCESS (SPECIFIED OR AS SHOWN ON DWGS)

PIPING

	PIPE ELBOW UP OR PIPE TEE UP AND DOWN
	PIPE ELBOW DOWN
	PIPE TEE UP
	PIPE TEE DOWN
	PIPE RISE
	PIPE CAP
	PIPE PLUG
	FLOW DIRECTION
	PIPE BREAK
	PIPE CONNECTION

HYDRONIC PIPING SYSTEM

	(E)HEATING WATER SUPPLY
	(E)HEATING WATER RETURN
	(E)CHILLED WATER SUPPLY
	(E)CHILLED WATER RETURN

DUCTWORK

	BACKDRAFT DAMPER
	VOLUME DAMPER
	FLEXIBLE CONNECTION TO MECHANICAL EQUIPMENT
	TRANSITION - FROM RECTANGULAR TO ROUND
	TRANSITION - FROM ROUND TO RECTANGULAR
	RISE IN DUCT (D=DROP IN DUCT)
	DUCT SIZE (CLEAR INSIDE DIMENSION)
	RECTANGULAR DUCT UP
	RECTANGULAR DUCT DN
	ROUND DUCT UP
	ROUND DUCT DN
	FLEXIBLE DUCTWORK
	TRANSITION OR REDUCER (FOT=FLAT ON TOP, FOB=FLAT ON BOTTOM)
	TRANSITION - ECCENTRIC
	45° ELBOW, R/D OR R/W=1.5
	90° ELBOW, R/D OR R/W=1.5
	SQUARE CORNER ELBOW WITH TURNING VANES
	90° TAKE-OFF WITH 45° TAPER
	45° TAKE-OFF
	RADIUS TAP IN
	WYE FITTING
	RADIUS TEE
	SQUARE TEE WITH TURNING VANES
	BULLHEAD TEE

	SECTION THRU RECTANGULAR SUPPLY AIR DUCT
	SECTION THRU RECTANGULAR RETURN OR OUTSIDE AIR DUCT
	SECTION THRU RECTANGULAR EXHAUST AIR DUCT
	SECTION THRU ROUND DUCT
	RECTANGULAR SUPPLY DUCT ROOF PENETRATION
	RECTANGULAR RETURN OR OUTSIDE AIR DUCT ROOF PENETRATION
	RECTANGULAR EXHAUST DUCT ROOF PENETRATION
	ROUND DUCT ROOF PENETRATION

INLETS AND OUTLETS

	GRILLE REGISTER OR DIFFUSER TYPE
	RUNOUT SIZE (INCHES)
	AIR QUANTITY (CFM)
	CEILING DIFFUSER
	1-WAY DIRECTION FLOW
	2-WAY DIRECTION FLOW
	3-WAY DIRECTION FLOW
	RETURN/RELIEF AIR GRILLE
	EXHAUST AIR GRILLE
	LINEAR DIFFUSER/GRILLE
	SUPPLY GRILLE
	RETURN/EXHAUST GRILLE
	TRANSFER GRILLE
	RETURN/EXHAUST AIRFLOW
	SUPPLY AIR FLOW

CONTROLS (PLAN VIEW)

	THERMOSTAT OR TEMPERATURE SENSOR
	SENSOR: SHOWN WITH GUARD (TYPICAL ALL SENSORS)
	HUMIDISTAT OR HUMIDITY SENSOR
	CARBON MONOXIDE SENSOR
	CARBON DIOXIDE SENSOR
	INDOOR AIR QUALITY SENSOR
	MOTORIZED DAMPER
	AIRFLOW MEASURING UNIT
	DUCT SMOKE DETECTOR
	TEMPERATURE TRANSMITTER
	PRESSURE TRANSMITTER
	AQUASTAT
	DIFFERENTIAL PRESSURE SENSOR
	DIFFERENTIAL PRESSURE MONITOR
	AUTOMATIC CONTROL VALVE, 3-WAY
	AUTOMATIC CONTROL VALVE, 2-WAY
	DIRECT DIGITAL CONTROL PANEL
	SWITCH BY MECHANICAL

DRAWING INDEX

M-1	MECHANICAL LEGEND AND SHEET INDEX
M-2	MECHANICAL GENERAL NOTES AND ABBREVIATIONS
M-3	MECHANICAL SCHEDULES AND PHASING NOTES
M-4	MECHANICAL DEMOLITION PLAN
M-5	MECHANICAL ENLARGED PLAN
M-6	MECHANICAL SECTIONS
M-7	FAN ARRAY & FILTER MOUNTING FRAME ISOMETRIC FRONT & LEFT ELEVATIONS

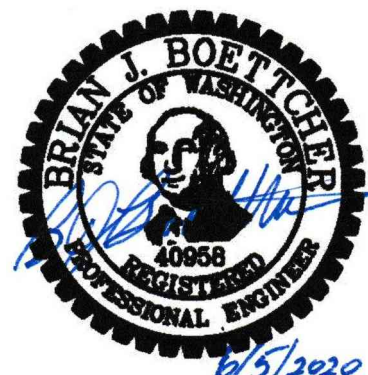
NOT ALL SYMBOLS MAY APPEAR ON THE DRAWINGS

HARGIS ENGINEERS

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seattle, washington 98101
t 206.448.3376 w hargis.biz

WARNING
0 1
IF THIS BAR DOES
NOT MEASURE 1"
THEN DRAWING IS
NOT TO SCALE

REVISION NO. 0



NO.	DATE	REVISION DESCRIPTION	DRAWN	CHECKED	STAMPED
			SLR	BJB	
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
ADMINISTRATION BUILDING MECHANICAL ROOM FAN MODIFICATION MECHANICAL LEGEND					
SUBMITTED		DRAWN		STAMPED	
		SLR		BJB	
APPROVED		DATE		DRAWING NO.	
		06/05/2020		M-1	

ABBREVIATIONS

Ø	DIAMETER, PHASE	F	FAHRENHEIT, FIRE MAIN PIPING	NA	NOT APPLICABLE
A	AIR, AMPS	FLA	FULL LOAD AMPS	NIC	NOT IN CONTRACT
AD	ACCESS DOOR	FLEX	FLEXIBLE	NO	NORMALLY OPEN, NITROUS OXIDE
AF	AIRFOIL	FLR	FLOOR	NO.	NUMBER
AFF	ABOVE FINISHED FLOOR	FLTR	FILTER	NTS	NOT TO SCALE
AFS	AIRFLOW MEASURING STATION	FMS	FLOW MEASUREMMENT STATION (HVAC, PLUMBING)	OA	OUTDOOR AIR
AG	ABOVE GROUND	FPM	FEET PER MINUTE	OBD	OPPOSED BLADE DAMPER
AHJ	AUTHORITY HAVING JURISDICTION	FPS	FEET PER SECOND	OC	ON CENTER
AHU	AIR HANDLING UNIT	F/S	FIRE/SMOKE DAMPER	OD	OUTSIDE DIMENSION OR DIAMETER
AL	ACOUSTIC LINED (DUCT)	FT	FEET, FIN TUBE	OSA	OUTDOOR SUPPLY AIR
AMB	AMBIENT	FV	FACE VELOCITY	OV	OUTLET VELOCITY
AP	ACCESS PANEL	G	GAS	PD	PRESSURE DROP, PUMPED DRAIN
APD	AIR PRESSURE DROP	GAL	GALLONS	PH	PHASE
ARCH	ARCHITECT	GC	GAS COCK, GENERAL CONTRACTOR	POC	POINT OF CONNECTION
ASSY	ASSEMBLY	GPM	GALLONS PER MINUTE	PR	CONDENSATE PUMP RETURN
		GWB	GYPSPUM WALLBOARD	PRV	PRESSURE REDUCING VALVE
				PSIG	POUNDS PER SQUARE INCH GAGE
BDD	BACK DRAFT DAMPER	H	HUMIDISTAT, HEIGHT	QTY	QUANTITY
BF	BELOW FLOOR	HC	HEATING COIL		
BHP	BRAKE HORSE POWER	HORIZ	HORIZONTAL	RA	RETURN AIR, RELIEF AIR
BLW	BELOW	HP	HORSEPOWER, HEAT PUMP	REF	REFERENCE, RETURN/EXHAUST FAN
BOD	BOTTOM OF DUCT	HTG	HEATING	RF	RELIEF FAN
BOP	BOTTOM OF PIPE	HVAC	HEATING, VENTILATING, AND AIR CONDITIONING	RLA	RATED LOAD AMPS
BOT	BOTTOM	HWS	HOT WATER SUPPLY	RPM	REVOLUTIONS PER MINUTE
BTUH	BRITISH THERMAL UNIT PER HOUR	HZ	HERTZ	RTU	ROOFTOP UNIT
				RV	SAFETY RELIEF VALVE
C	CONDENSATE PIPING	IAQ	INDOOR AIR QUALITY	S	SENSOR
CAP	CAPACITY	IE	INVERT ELEVATION	SA	SUPPLY AIR
CFM	CUBIC FEET PER MINUTE	IN.	INCH	SAT	SUPPLY AIR TEMPERATURE
CG	CEILING GRILLE	IN. WG	INCHES WATER COLUMN	SCFM	STANDARD CUBIC FEET PER MINUTE
CWR	CHILLED WATER RETURN	IW	INDIRECT WASTE PIPING	SCH	SCHEDULE
CWS	CHILLED WATER SUPPLY	L	LENGTH	SENS	SENSIBLE
CO2	CO2 SENSOR	LAT	LEAVING AIR TEMPERATURE	SF	SUPPLY FAN, SQUARE FOOT
CU	CONDENSING UNIT, CUBIC	LRA	LOCKED ROTOR AMPS	SP	STATIC PRESSURE
Cv	FLOW COEFFICIENT	LVR	LOUVER	SPS	STATIC PRESSURE STATION
CV	CONSTANT VOLUME			ST	SOUND TRAP
CW	COLD WATER PIPING				
				TCV	TEMPERATURE CONTROL VALVE
D	DRAIN			TD	TRENCH DRAIN, TEMPERATURE DIFFERENCE
DB	DRY BULB (TEMPERATURE)			TDH	TOTAL DYNAMIC HEAD
dB	DECIBEL			TEMP	TEMPERATURE
DEG	DEGREE	MAT	MIXED AIR TEMPERATURE	TOD	TOP OF DUCT
DIA	DIAMETER	MAX	MAXIMUM	TOP	TOP OF PIPE
DWGS	DRAWINGS	MBH	THOUSAND BTU PER HOUR	TOS	TOP OF STEEL
DV	DRAIN VALVE	MC	MECHANICAL CONTRACTOR	TOF	TOP OF FOOTING
		MCA	MINIMUM CIRCUIT AMPACITY	TSP	TOTAL STATIC PRESSURE
(E)	EXISTING	MECH	MECHANICAL	T'STAT	THERMOSTAT
EA	EXHAUST AIR	MERV	MINIMUM EFFICIENCY REPORTING VALUE	TYP	TYPICAL
EAT	ENTERING AIR TEMPERATURE	MIN	MINIMUM		
EF	EXHAUST FAN	MOCP	MAXIMUM OVERCURRENT PROTECTION	UH	UNIT HEATER
EFF	EFFICIENCY	MOD	MOTOR OPERATED DAMPER	UNO	UNLESS NOTED OTHERWISE
EL	ELEVATION				
ELEC	ELECTRIC			V	VENT PIPING, VOLT
EMCS	ENERGY MANAGEMENT AND CONTROL SYSTEM			VAV	VARIABLE AIR VOLUME
EQUIV	EQUIVALENT			VD	VOLUME DAMPER
ESP	EXTERNAL STATIC PRESSURE			VEL	VELOCITY
EVAP	EVAPORATOR, EVAPORATIVE			VENT	VENTILATION, VENTILATOR
EWC	ELECTRIC WATER COOLER			VFD	VARIABLE FREQUENCY DRIVE
EWT	ENTERING WATER TEMP			VOLT	VOLTAGE
EXH	EXHAUST				
EXT	EXTERIOR, EXTERNAL			WG	WATER GAGE
				WT	WEIGHT

GENERAL NOTES - MECHANICAL

- COORDINATE MECHANICAL WORK WITH THAT OF OTHER TRADES (ELECTRICAL). REFER TO ELECTRICAL, DRAWINGS AND SPECIFICATIONS. COORDINATION SHALL OCCUR PRIOR TO FABRICATION, PURCHASE, AND/OR INSTALLATION OF ALL WORK.
- COORDINATE PLUMBING, AND HVAC SYSTEMS ROUTING PRIOR TO INSTALLATION. DURING LAYOUT COORDINATION, DUCTWORK TAKES PRECEDENCE OVER PLUMBING.
- UNLESS OTHERWISE SPECIFIED, THE GENERAL CONTRACTOR (GC) SHALL BE RESPONSIBLE FOR PAINTING, CUTTING, AND PATCHING OF EXISTING FLOORS, WALLS, AND PARTITIONS IN THE EXISTING BUILDING.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE KEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT, AND ENVIRONMENTAL CONDITIONS.

MECHANICAL EQUIPMENT INSTALLATION NOTES

- ACCESS CLEARANCES FOR MAINTENANCE AND REPLACEMENT: VERIFY PHYSICAL DIMENSIONS OF EQUIPMENT TO ENSURE THAT ACCESS CLEARANCES CAN BE MET. COORDINATE LOCATIONS OF MECHANICAL WORK AND WORK OF OTHER TRADES TO PROVIDE ACCESS CLEARANCES FOR SERVICE AND MAINTENANCE.
- MECHANICAL SYSTEM CONTRACTOR TO FURNISH, INSTALL, AND ADJUST ALL VIBRATION ISOLATION COMPONENTS AND MATERIALS REQUIRED TO ISOLATE THE BUILDING STRUCTURE AND OCCUPIED SPACES FROM VIBRATING EQUIPMENT, AND DUCTWORK

SHEET METAL NOTES

- ACCESS DOORS: PROVIDE AT OUTSIDE AIR MONITORING STATION.

ENERGY CODE NOTES

- MOTORS: COMPLY WITH MINIMUM FULL LOAD EFFICIENCIES LISTED IN ENERGY CODE ENFORCED BY AHJ.
- PIPING AND DUCT INSULATION: COMPLY WITH THICKNESSES AND TYPES LISTED IN ENERGY CODE ENFORCED BY AHJ UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED.
- DUCT SEALING: SEAL DUCT TRANSVERSE JOINTS AND LONGITUDINAL SEAMS PER ENERGY CODE ENFORCED BY AHJ UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED.
- RECORD DRAWINGS: SUBMIT TO THE BUILDING OWNER PER ENERGY CODE ENFORCED BY THE LOCAL AHJ.
- OPERATION AND MAINTENANCE MANUALS: SUBMIT TO THE BUILDING OWNER PER ENERGY CODE ENFORCED BY THE LOCAL AHJ.
- SYSTEM BALANCING: BALANCE HVAC SYSTEMS PER ENERGY CODE ENFORCED BY THE LOCAL AHJ AND SUBMIT A WRITTEN REPORT TO THE BUILDING OWNER. REFER TO SPECIFICATIONS FOR ADDITIONAL TESTING, ADJUSTING, AND BALANCING (TAB) REQUIREMENTS.
- MECHANICAL SYSTEMS COMMISSIONING AND COMPLETION REQUIREMENTS: TEST SYSTEMS TO ENSURE THAT BUILDING SYSTEMS HAVE BEEN DESIGNED, INSTALLED, AND FUNCTION PROPERLY, EFFICIENTLY, AND CAN BE MAINTAINED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS IN ORDER TO SATISFY THE BUILDING OWNER'S DESIGN INTENT AND OPERATIONAL REQUIREMENTS PER ENERGY CODE ENFORCED BY THE LOCAL AHJ. REFER TO SPECIFICATIONS FOR ADDITIONAL COMMISSIONING REQUIREMENTS
- THIS BUILDING AND ITS ENERGY SYSTEMS HAVE BEEN DESIGNED TO COMPLY WITH ENERGY CODE ENFORCED BY THE LOCAL AHJ. CONTRACTOR IS RESPONSIBLE FOR CORRECT INSTALLATION OF ENERGY CONSERVATION MEASURES.

NON-STRUCTURAL MECHANICAL COMPONENT NOTES

- THE COMPONENT IMPORTANCE FACTOR (Ip) FOR ALL NON-STRUCTURAL COMPONENTS SHALL BE:

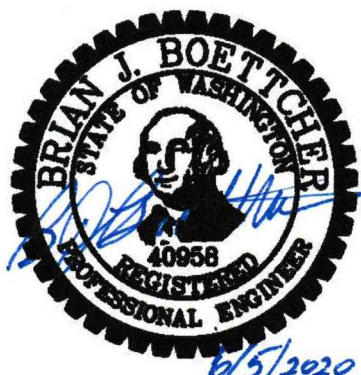
Ip = 1.0
- THE FOLLOWING ITEMS ARE TAKEN DIRECTLY FROM THE 2015 INTERNATIONAL BUILDING CODE AND FROM THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) STANDARD 7-05. THE CONTRACTOR SHALL REFER TO THE ABOVE FOR ADDITIONAL INFORMATION, EXCEPTIONS, AND FURTHER DESCRIPTIONS. THE CONTRACTOR SHALL ADHERE TO REQUIREMENTS AND AS SUCH, SHALL BE INCLUDED WITHIN BID. ALSO REFER TO SPECIFICATION SECTION 230550.
- 2015 IBC, 1613.1, SCOPE: ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND NON-STRUCTURAL COMPONENTS THAT ARE PERMANENTLY ATTACHED TO STRUCTURES AND THEIR SUPPORTS AND ATTACHMENTS SHALL BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF EARTHQUAKE MOTIONS IN ACCORDANCE WITH ASCE 7-05, EXCLUDING CHAPTER 14 AND APPENDIX 11A.
- 2015 IBC, 1704.4, CONTRACTOR RESPONSIBILITY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF A SEISMIC-FORCE-RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM, OR SEISMIC-RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS AND SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL INCLUDE THE FOLLOWING:
 - ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTIONS;
 - ACKNOWLEDGEMENT THAT CONTROL WILL BE EXERCISED TO OBTAIN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS APPROVED BY THE BUILDING OFFICIAL;
 - PROCEDURES FOR EXERCISING CONTROL WITHIN THE CONTRACTOR'S ORGANIZATION, THE METHOD AND FREQUENCY OF REPORTING AND THE DISTRIBUTION OF THE REPORTS;
 - IDENTIFICATION AND QUALIFICATIONS OF THE PERSON(S) EXERCISING SUCH CONTROL AND THEIR POSITION(S) IN THE ORGANIZATION.
- DIVISION 23 RESPONSIBILITIES:
 - HANGERS AND SEISMIC BRACING FOR MECHANICAL SYSTEMS SHALL BE DESIGNED AND SPECIFIED BY DIVISION 23. DIVISION 23 SHALL REFER TO THE MECHANICAL DRAWINGS FOR LOCATIONS OF EQUIPMENT AND HUNG MECHANICAL SYSTEMS AS STRUCTURAL DRAWINGS DO NOT SHOW THE LOCATIONS OF MECHANICAL EQUIPMENT, DUCTWORK, PIPING, AND OTHER COMPONENTS.
 - DIVISION 23 SHALL COORDINATE THE SUPPORT SYSTEMS AND DESIGN LOADS FOR HUNG PIPING AND OTHER MECHANICAL SYSTEMS (INCLUDING COMBINED MULTIPLE PIPE RUNS) WITH THE GENERAL CONTRACTOR AND THE STEEL AND WOOD JOIST MANUFACTURERS IN ADDITION TO OTHER TRADES THAT MAY BE IMPACTED.

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NO.	DATE	REVISION DESCRIPTION	DRAWN	CHECKED	STAMPED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
ADMINISTRATION BUILDING MECHANICAL ROOM FAN MODIFICATION MECHANICAL GENERAL NOTES					
SUBMITTED		DRAWN SLR		STAMPED BJB	
APPROVED		DATE 06/05/2020			
		DRAWING NO.		M-2	

FAN SCHEDULE

MARK	LOCATION	AREA SERVED	MANUFACTURER / MODEL NO.	FAN TYPE	AIRFLOW (CFM)	AIRFLOW (CFM) EACH FAN	ESP (IN WG)	FAN RPM	FAN WHEEL				FAN MOTOR					SPEED CONTROL	BACKDRAFT DAMPER AT FAN	PHYSICAL		MOUNTING / SUPPORT	DETAIL / DIAGRAM REFERENCE	INTERLOCK DIV 23	INTERLOCK DIV 26	CONTROL DIAGRAM / SEQUENCE	NOTES
									TYPE	SIZE (IN)	DRIVE	MODEL	RPM	HP EACH	MCA	MOCp	V/Ø			LxWxH (INxINxIN)	WEIGHT (LBS)						
SF-01	PENTHOUSE MECHANICAL ROOM	MAIN BUILDING	QPAC FAN ARRAY	SUPPLY FAN ARRAY (24)	151,000	6,292	2.50	1469	PLUG	22" DIA	DIRECT	054	1750	3.74	110.3	125	460/3	ECM	N	28.8x28.8x18.9	126 EACH	FLOOR		Y	Y		1

NOTES:
1. SHALL BE PROVIDED WITH A VISIBLE NAMEPLATE INDICATING THE SHORT CIRCUIT CURRENT RATING (SCCR) IN ACCORDANCE WITH UL REQUIREMENTS. REFER TO ELECTRICAL DRAWINGS FOR MINIMUM RATINGS.

MECHANICAL EQUIPMENT SOUND POWER LEVEL SCHEDULE

MARK	AREA SERVED	FAN TYPE	MAX AIRFLOW	FAN QTY	OCTAVE BAND CENTER FREQUENCY (HERTZ)							
					63	125	250	500	1000	2000	4000	8000
SF-01	ADMINISTRATION BLDG	FAN WALL	151,000	(24) 3.74HP	85.0	96.0	96.0	95.0	92.0	88.0	86.0	83.0

FILTER SCHEDULE

MARK	LOCATION	AREA SERVED	MANUFACTURER / MODEL NO.	ASSOCIATED UNIT	AIRFLOW (CFM)	FILTER						MOUNTING / SUPPORT	DETAIL / DIAGRAM REFERENCE	NOTES
						TYPE	MERV RATING	FACE VEL (FPM)	INITIAL PD (IN WC)	FINAL PD (IN WC)	QTY/SIZE (#)/(INxINxIN)			
FB-01	PENTHOUSE MECHANICAL ROOM	BUILDING	AIRGUARD V-FORCE VPP2V-S-8504	SF-01	151,000	CARTRIDGE	13	524	0.38	1.00	(72) 24x24x12	FRAME		1

NOTES:
1. FILTERS ARE MOUNTED IN RE-USED AND RELOCATED EXISTING FILTER FRAMES

PHASING NOTES:

- EXISTING SUPPLY FAN IS TO REMAIN IN OPERATION AS THE NEW FAN ARRAY SYSTEM IS INSTALLED. CONTACT OWNER 3 DAYS PRIOR TO ANY SHUTDOWN OF THE EXISTING SUPPLY FAN SYSTEM. KEEP DOWN TIME TO A MINIMUM, BUILDING IS OCCUPIED.
- DEMO EXISTING FILTERS, FILTER HOUSINGS AND CHARCOAL FILTER HOUSING. DEMO EXISTING DOOR AND PLENUM WALL IN THE MIXED AIR PLENUM. SEE DEMO NOTES 2, 3, AND 4 ON M-4. KEEP AREA CLEAN OF DEBRIS.
- PROVIDE NEW PIPE SUPPORTS FOR EXISTING PIPING AS REQUIRED. SEE FLAG NOTE 5 ON M-5. DEMO OLD PIPE SUPPORT.
- PROVIDE AND INSTALL FAN ARRAY SYSTEM INTO POSITION AND PROVIDE ALL STRUCTURAL SUPPORTS. SEE FLAG NOTE 1 ON M-5. BUILD SEPARATION WALL AND PROVIDE MAN DOOR. SEE FLAG NOTE 3 ON M-5.
- MOUNT FAN ARRAY CONTROL PANEL ON NEW MIXED AIR PLENUM WALL. PROVIDE ALL FIELD WIRING BETWEEN THE QUICK CONNECT BOX AND THE CONTROL PANEL. PROVIDE ALL FIELD WIRING BETWEEN THE QUICK CONNECT BOX AND EACH FAN IN THE ARRAY. CONNECT ELECTRICAL AND CONTROLS TO FAN ARRAY SYSTEM, PROVIDE COMMISSIONING.
- PROVIDE AND INSTALL FILTER RACK SYSTEMS FB-01 AND ALL STRUCTURAL SUPPORTS.
- COMPLETE INSTALLATION OF FAN ARRAY CONTROL PANEL AND INTERCONNECT WIRING.
- DEMOLISH EXISTING OUTSIDE AIR DAMPER AND DUCTWORK. INSTALL NEW OUTSIDE AIR DAMPER, DUCTWORK, AND AIRFLOW MONITORING STATION
- PROVIDE AND INSTALL AS MUCH OF THE STRUCTURAL SUPPORT SYSTEM FOR PLENUM RATED WALL. INSTALL AS MUCH OF THE SUPPLY PLENUM WALL AS POSSIBLE.
- BRING SF-01 ON LINE TO SUPPLY AIR TO THE EXISTING SUPPLY AIR SYSTEM. CONTINUE TO INSTALL THE SUPPLY PLENUM DUCTWORK AND PROVIDE ANY OPENINGS FOR EXISTING PIPING AND OR CONDUIT TO PASS THROUGH. SEAL ALL PENETRATIONS. SEAL ALL DUCTWORK SEAMS INCLUDING THE FLOOR AND CEILING OF PLENUM.

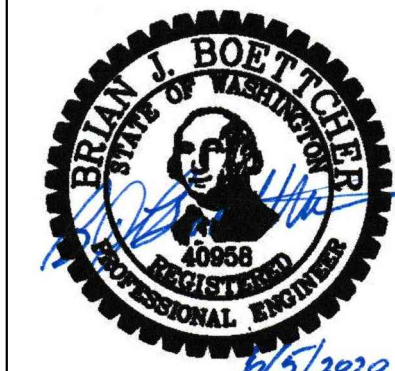
PHASING NOTES:

- PROVIDE AN ANGLE IRON FRAME TO SUPPORT EXISTING ELBOW. SEE FLAG NOTE 6. DROP EXISTING ELBOW DOWN TO SUPPORT FRAME, AND PROVIDE DUCT EXTENSION FROM (E)ELBOW TO DUCT PENETRATION ABOVE. SEAL ALL SEAMS. PROVIDE DUCT TRANSITION AND MAKE CONNECTION TO (E)ELBOW, SEE FLAG NOTE 7.
- TAKE EXISTING SUPPLY FAN OFF LINE AND DEMO FAN, FAN MOTOR, ELECTRICAL AND EXISTING DUCTWORK TO EXISTING ELBOW. IT IS ASSUMED THE EXISTING FAN WILL BE CUT INTO SMALLER MANAGEABLE PIECES FOR REMOVAL FROM SPACE.
- COMPLETE INSTALLATION OF PLENUM WALL BETWEEN MIXED AIR AND SUPPLY AIR PLENUMS.
- PROVIDE FILTERS FOR ALL FILTER BANKS. DO FINAL COMMISSIONING OF SF-01 SYSTEM, PROVIDE AIR BALANCING OF SYSTEM. SET OSA TO 10,000 CFM THRU AIR FLOW MONITORING STATION. PROVIDE COMMISSIONING REPORT AND AIR BALANCING REPORT.

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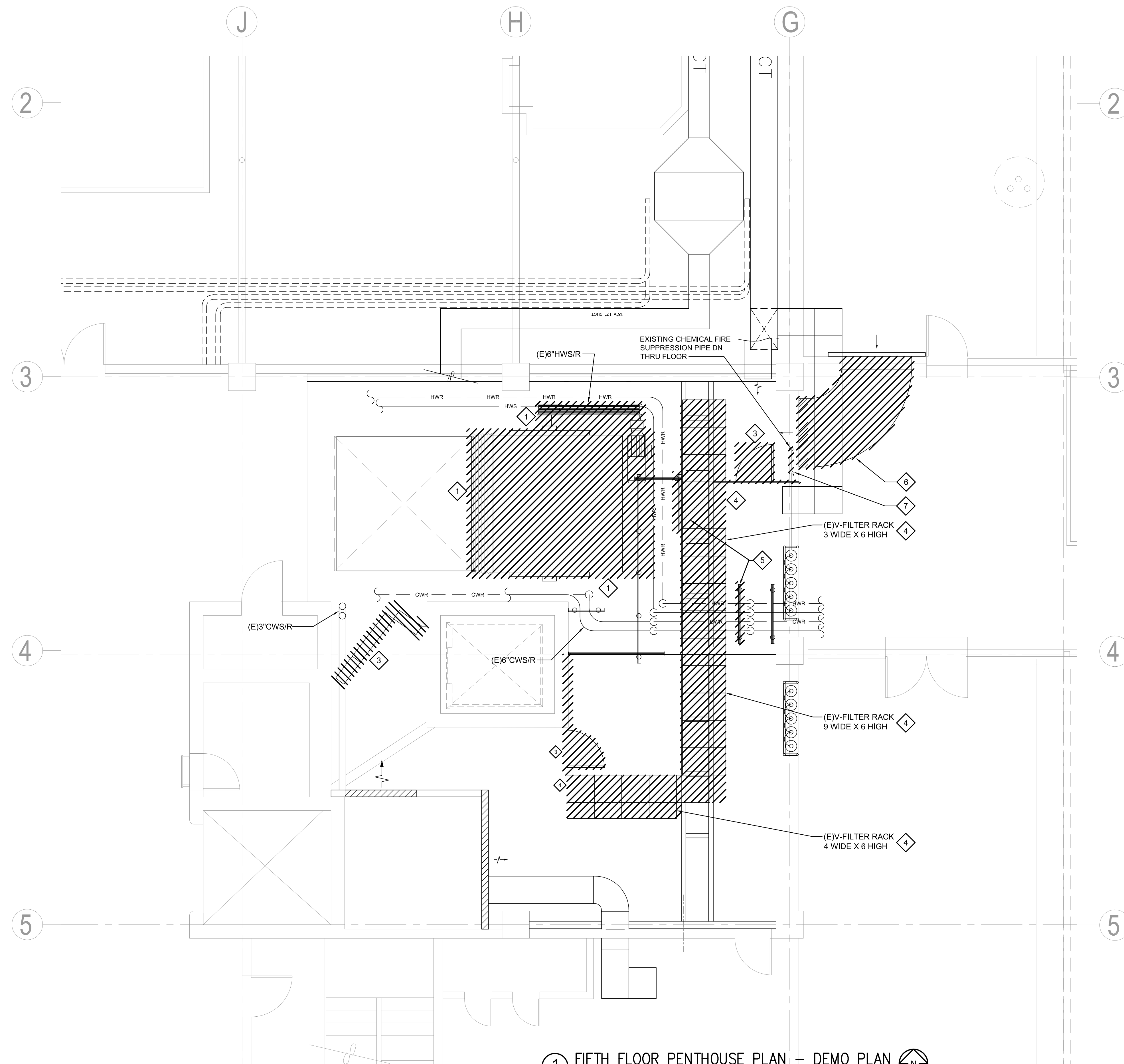
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CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
ADMINISTRATION BUILDING MECHANICAL ROOM FAN MODIFICATION MECHANICAL SCHEDULES					
SUBMITTED 					



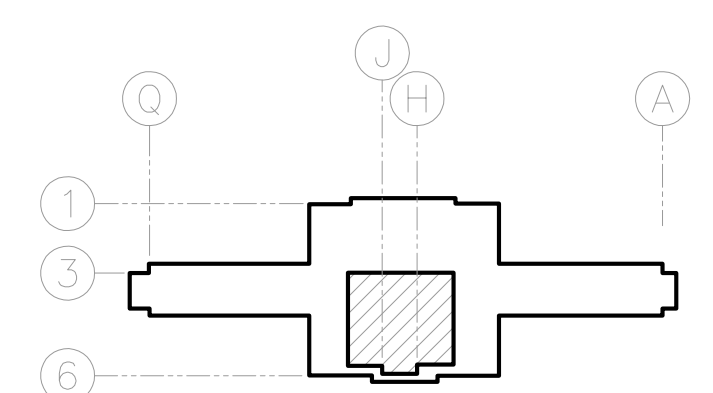
① FIFTH FLOOR PENTHOUSE PLAN - DEMO PLAN
SCALE: 1/4" = 1'-0"

PHASING NOTES:

1. SEE PHASING NOTES ON M-3.

DEMO NOTES:

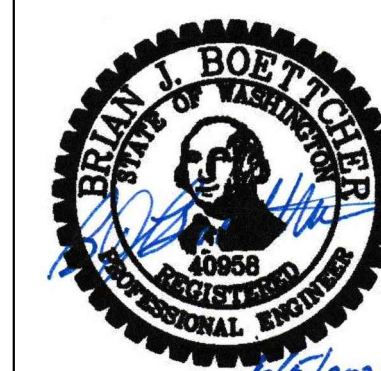
- 1 DEMOLISH EXISTING UTILITY FAN, MOTOR AND BELTS.
- 2 NOT USED
- 3 DEMOLISH EXISTING DOOR AND ASSOCIATED SHEET METAL PANEL.
- 4 DEMOLISH EXISTING FILTERS, FILTER HOUSING, CHARCOAL FILTER HOUSING AND BLANK-OFF PANEL. RETAIN FILTER RACK FOR RE-USE
- 5 DEMOLISH PIPE STAND AFTER NEW PIPE STAND IS INSTALLED.



PENTHOUSE KEY PLAN
SCALE: N.T.S.

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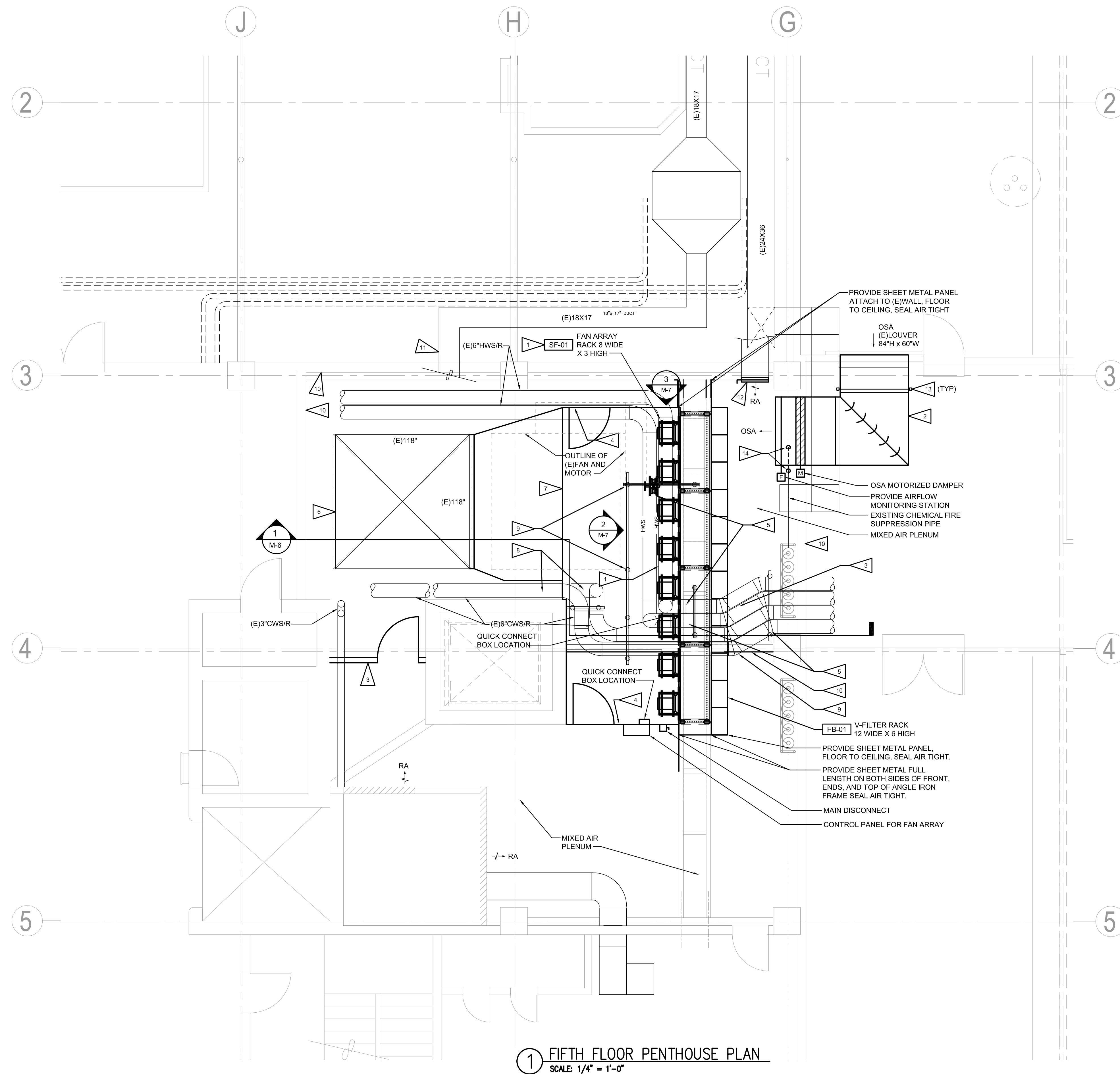
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ADMINISTRATION BUILDING MECHANICAL ROOM FAN MODIFICATION DEMOLITION					
SUBMITTED			DRAWN SLR	STAMPED BJB	
APPROVED			06/05/2020 DATE	DRAWING NO. M-4	



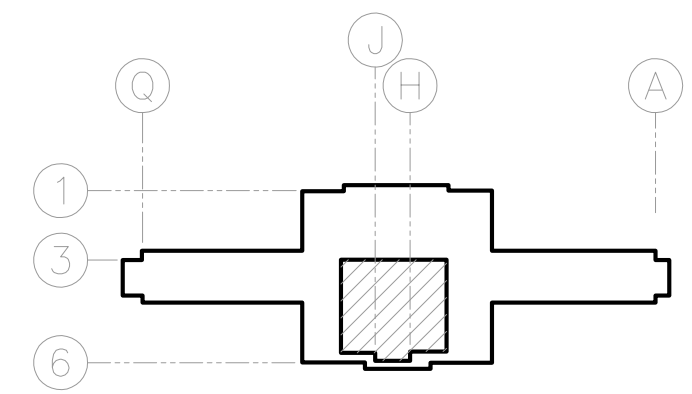
1 FIFTH FLOOR PENTHOUSE PLAN
SCALE: 1/4" = 1'-0"

PHASING NOTES:

1. SEE PHASING NOTES ON M-3.

FLAG NOTES:

- 1 FAN ARRAY SYSTEM, 8 FANS LONG X 3 FANS HIGH, PROVIDE ALL STRUCTURAL SUPPORTS.
- 2 INSTALL OSA DAMPER, DUCTWORK, ELBOW AND CONNECTION TO EXISTING LOUVER, EXTERNALLY INSULATE WITH R-8 TO MEET WSEC CODE REQUIREMENTS WITH VAPOR BARRIER
- 3 PROVIDE GENERAL CONSTRUCTION OF 2X4 SHEET METAL STUD WALL WITH 36X72 DOOR. SEAL CONSTRUCTION TO WITHSTAND 6" INTERNAL STATIC PRESSURE.
- 4 PROVIDE CONSTRUCTION OF PLENUM RATED SHEET METAL WALL FLOOR TO FLOOR ABOVE, PROVIDE 36X72 DOOR. SEAL CONSTRUCTION TO WITHSTAND 6" INTERNAL STATIC PRESSURE. PROVIDE PENETRATIONS THRU SHEET METAL WALL FOR EXISTING PIPING AND CONDUIT. SEAL AROUND PENETRATIONS.
- 5 EXISTING PIPES AND RACKS TO REMAIN. MODIFY AS REQUIRED TO PROVIDE FAN & FILTER CLEARANCE.
- 6 LOWER EXISTING ELBOW, PROVIDE NEW CONNECTION BETWEEN THE EXISTING ELBOW AND THE DUCT PENETRATION AT THE CEILING. PROVIDE ANGLE IRON FRAME UNDER THE EXISTING ELBOW.
- 7 PROVIDE A SHEET METAL TRANSITION FROM FLOOR TO EXISTING DUCT. FIELD VERIFY EXACT SIZE.
- 8 SEAL AROUND EACH PIPE THAT PENETRATES THE TOP OF THE DUCT PLENUM.
- 9 EXISTING CWS(R) & HWS(R) PIPING AND SUPPORTS SHALL REMAIN. SUPPORTS MODIFIED WHERE NECESSARY TO PROVIDE ACCESS CLEARANCES FOR FANS AND FILTERS
- 10 PATCH AND SEAL ALL WALL PENETRATION BY CITY PERSONNEL IN COORDINATION WITH CONTRACTOR'S SCHEDULING
- 11 RE-CONNECT DUCTWORK TO EXISTING MAIN SUPPLY DUCT, FIELD VERIFY EXACT SIZE
- 12 PROVIDE NEW MANUALLY LOCKABLE CONTROL DAMPER TO EXISTING RETURN DUCT, FIELD VERIFY EXACT SIZE
- 13 PROVIDE SUPPORT FRAME CONSTRUCTED OF GALVANIZED STEEL WITH LEGS AND FEET FOR DUCTWORK AND ELBOW
- 14 REVISE EXISTING CHEMICAL FIRE SUPPRESSION PIPE TO AVOID AIRFLOW MONITOR STATION AND DUCTWORK FROM ELBOW DOWN TO STREET ELBOW NEAR FLOOR PENETRATION

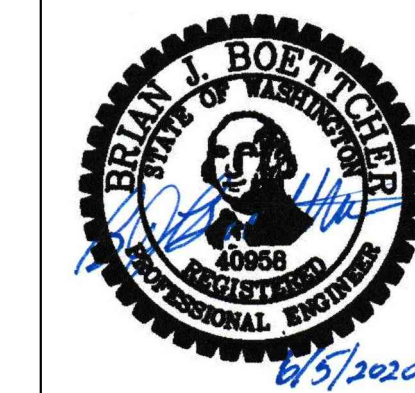


PENTHOUSE KEY PLAN
SCALE: N.T.S.

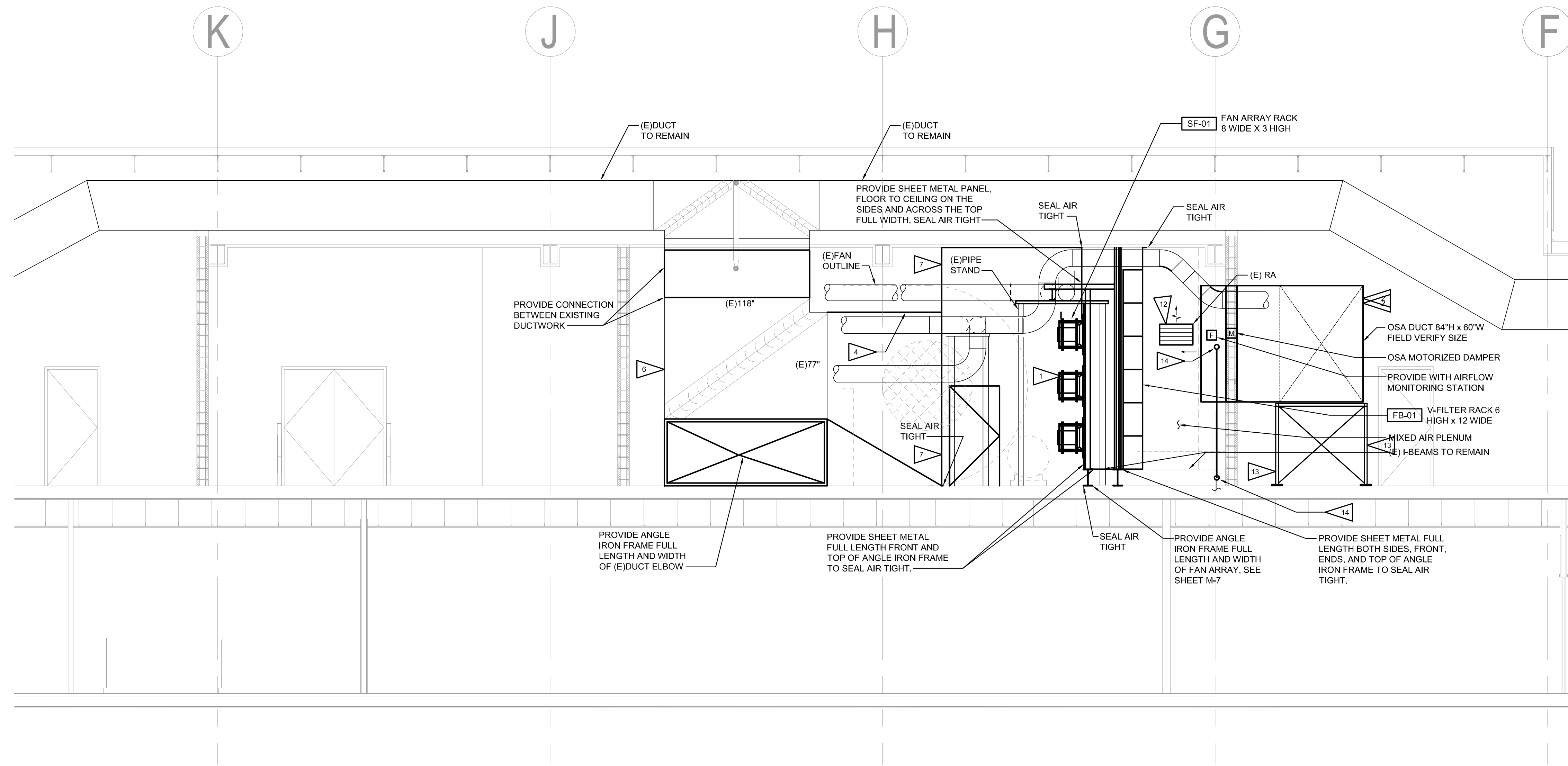
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ADMINISTRATION BUILDING MECHANICAL ROOM FAN MODIFICATION ENLARGED PLAN					
SUBMITTED			DRAWN SLR	STAMPED BJB	
APPROVED			06/05/2020 DATE		
			DRAWING NO.	M-5	



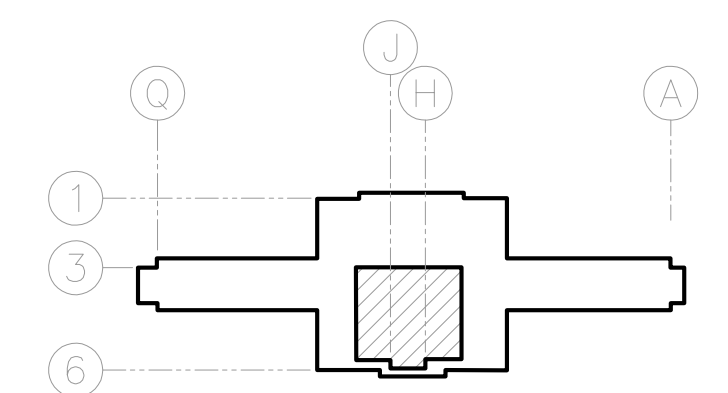
1 5th FLOOR PENTHOUSE SECTION VIEW
SCALE: 1/4" = 1'-0"

PHASING NOTES:

1. SEE PHASING NOTES ON M-3.

FLAG NOTES:

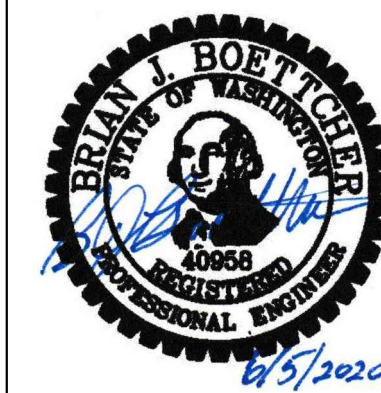
- 1 FAN ARRAY SYSTEM. 8 FANS LONG X 3 FANS HIGH. PROVIDE ALL STRUCTURAL SUPPORTS.
- 2 INSTALL OSA DAMPER, DUCTWORK, ELBOW AND CONNECTION TO EXISTING LOUVER. EXTERNALLY INSULATE WITH R-8 TO MEET WSEC CODE REQUIREMENTS WITH VAPOR BARRIER
- 3 PROVIDE GENERAL CONSTRUCTION OF 2X4 SHEET METAL STUD WALL WITH 36x72 DOOR. SEAL CONSTRUCTION TO WITHSTAND 6" INTERNAL STATIC PRESSURE.
- 4 PROVIDE CONSTRUCTION OF PLENUM RATED SHEET METAL WALL FLOOR TO FLOOR ABOVE. PROVIDE 36x72 DOOR. SEAL CONSTRUCTION TO WITHSTAND 6" INTERNAL STATIC PRESSURE. PROVIDE PENETRATIONS THRU SHEET METAL WALL FOR EXISTING PIPING AND CONDUIT. SEAL AROUND PENETRATIONS.
- 5 EXISTING PIPES AND RACKS TO REMAIN. MODIFY AS REQUIRED TO PROVIDE FAN & FILTER CLEARANCE.
- 6 LOWER EXISTING ELBOW. PROVIDE NEW CONNECTION BETWEEN THE EXISTING ELBOW AND THE DUCT PENETRATION AT THE CEILING. PROVIDE ANGLE IRON FRAME UNDER THE EXISTING ELBOW.
- 7 PROVIDE A SHEET METAL TRANSITION FROM FLOOR TO EXISTING DUCT. FIELD VERIFY EXACT SIZE.
- 8 SEAL AROUND EACH PIPE THAT PENETRATES THE TOP OF THE DUCT PLENUM.
- 9 EXISTING CWS(R) & HWS(R) PIPING AND SUPPORTS SHALL REMAIN. SUPPORTS MODIFIED WHERE NECESSARY TO PROVIDE ACCESS CLEARANCES FOR FANS AND FILTERS
- 10 PATCH AND SEAL ALL WALL PENETRATION BY CITY PERSONNEL IN COORDINATION WITH CONTRACTOR'S SCHEDULING
- 11 RE-CONNECT DUCTWORK TO EXISTING MAIN SUPPLY DUCT, FIELD VERIFY EXACT SIZE
- 12 PROVIDE NEW MANUALLY LOCKABLE CONTROL DAMPER TO EXISTING RETURN DUCT, FIELD VERIFY EXACT SIZE
- 13 PROVIDE SUPPORT FRAME CONSTRUCTED OF GALVANIZED STEEL WITH LEGS AND FEET FOR DUCTWORK AND ELBOW
- 14 REVISE EXISTING CHEMICAL FIRE SUPPRESSION PIPE TO AVOID AIRFLOW MONITOR STATION AND DUCTWORK FROM ELBOW DOWN TO STREET ELBOW NEAR FLOOR PENETRATION



PENTHOUSE KEY PLAN
SCALE: N.T.S.

WARNING
0 1
IF THIS BAR DOES
NOT MEASURE 1"
THEN DRAWING IS
NOT TO SCALE

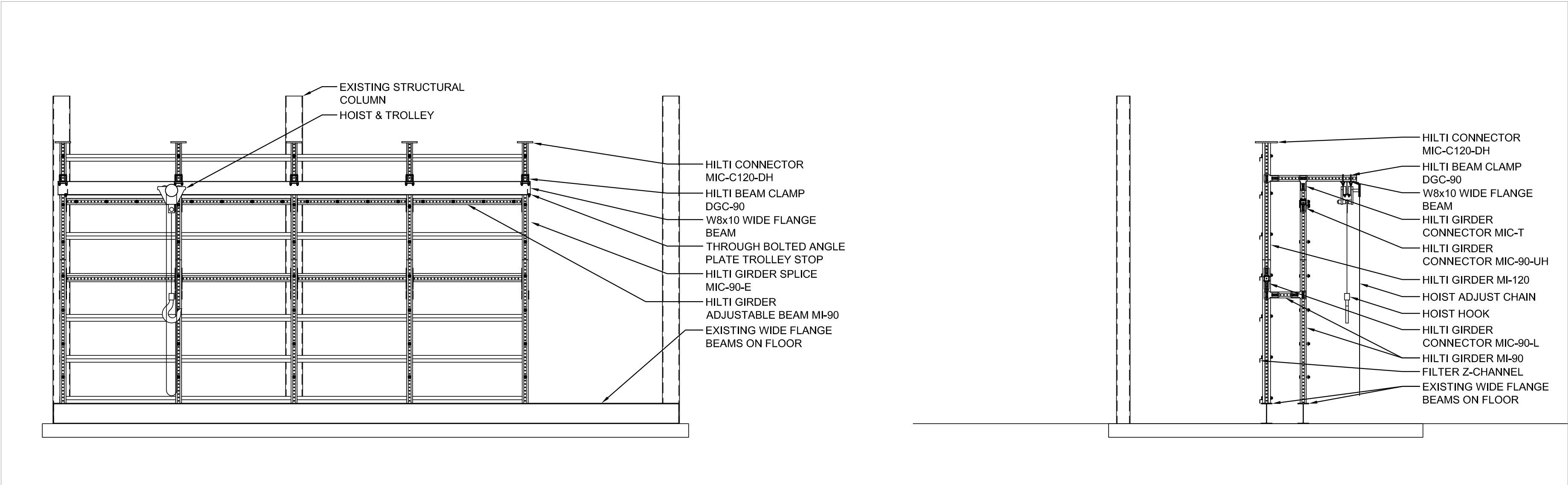
REVISION NO. 0



HARGIS
ENGINEERS

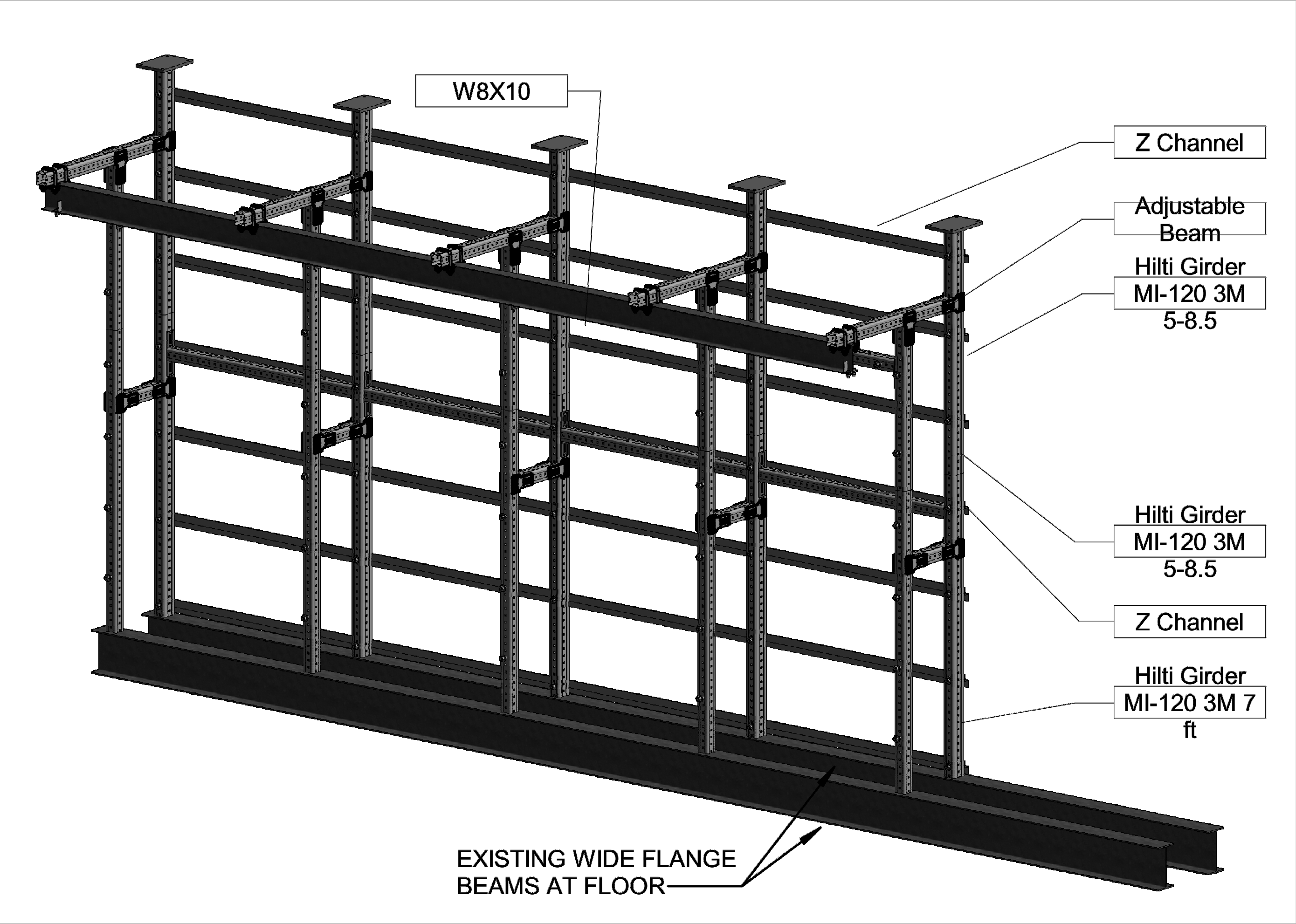
1201 third avenue, suite 600
seattle, washington 98101
t 206.448.3376 w hargis.biz

NO.	DATE	REVISION	DESCRIPTION	DRAWN	CHECKED	STAMPED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION						
ADMINISTRATION BUILDING MECHANICAL ROOM FAN MODIFICATION SECTIONS						
<div>SUBMITTED</div> <div></div> <div></div> <div></div>				DRAWN	STAMPED	
				SLR	BJB	
				06/05/2020		
<div>APPROVED</div> <div></div> <div></div>				DATE		
				DRAWING NO.		M-6

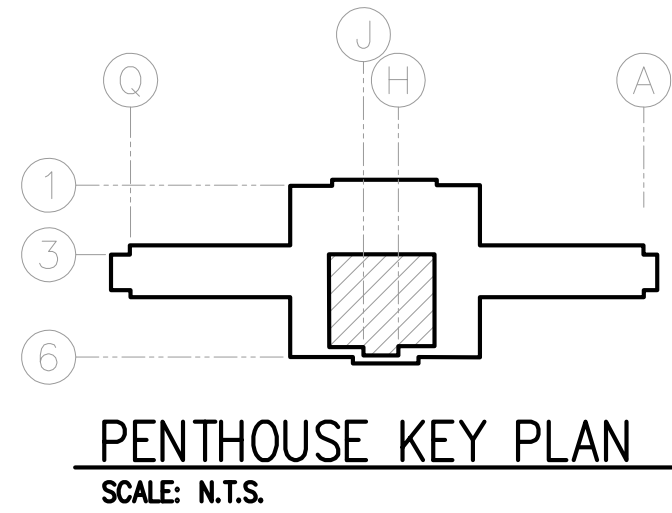


② FAN ARRAY & FILTER MOUNTING FRAME FRONT ELEVATION
SCALE: 1/4" = 1'-0"

③ FAN ARRAY & FILTER MOUNTING FRAME LEFT ELEVATION
SCALE: 1/4" = 1'-0"



① FAN ARRAY & FILTER MOUNTING FRAME ISOMETRIC
SCALE: NONE



WARNING
0 1
IF THIS BAR DOES
NOT MEASURE 1"
THEN DRAWING IS
NOT TO SCALE

REVISION NO. 0

NO.	DATE	REVISION DESCRIPTION	DRAWN	CHECKED	STAMPED
CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION					
ADMINISTRATION BUILDING MECHANICAL ROOM FAN MODIFICATION FAN ARRAY MOUNTING FRAME					
SUBMITTED			DRAWN TP/BB	STAMPED	
APPROVED			06/05/2020	DATE	
			DRAWING NO.	M-7	

1. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE DRAWINGS, SPECIFICATIONS, AND THE CODES, RULES AND REGULATIONS OF THE INTERNATIONAL BUILDING CODE, 2018 EDITION, AS AMENDED BY THE STATE OF WASHINGTON AND THE CITY OF TACOMA. BASIS OF DESIGN CODES: ASCE 7-16 MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA AND OTHER STRUCTURES

2. DESIGN LOADS:
FAN WEIGHT: 150 POUNDS PER
FILTER WEIGHT: 10 POUNDS PER SQUARE FOOT
LIVE LOADS: 10 POUNDS PER SQUARE FOOT AIR PRESSURE DIFFERENTIAL
SEISMIC DESIGN: SDS=1.090g, IMPORTANCE FACTOR, IP=1.5, AP=2.5, RP=6.0

3. STEEL MATERIALS:
ANGLES, CHANNELS AND ROUNDS: ASTM A36
STRUT CHANNEL: HILTI MI SYSTEM AND COMPONENTS
CONNECTION BOLTS: ASTM A307, OR SAE GRADE 5
COLD FORM GAUGE MATERIAL: AISI S100 MATERIAL WITH YEILD STRENGTH OF 33 KSI MINIMUM
SHEET METAL SCREWS: ASTM A510 GRADE 1018-1022

STRUCTURAL STEEL DETAILING, FABRICATION AND ERECTION SHALL BE BASED ON THE LATEST EDITION AND SUPPLEMENTS OF THE AISC "DESIGN SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".

ALL WELDS SHALL BE PREQUALIFIED IN CONFORMANCE WITH AISC AND AWS STANDARDS AND SHALL BE PERFORMED BY WELDERS CERTIFIED IN THE JURISDICTION HAVING AUTHORITY. USE E70XX ELECTRODES FOR STRUCTURAL STEEL AND E60XX ELECTRODES FOR COLD FORMED/SHEET METAL "GAUGE" STEEL. WELD LENGTHS CALLED FOR ON THE PLANS ARE THE NET EFFECTIVE LENGTH REQUIRED. WELD SIZE SHALL BE AISC MINIMUM, UNLESS OTHERWISE NOTED. WELDING OF STRUCTURAL STEEL PER AWS D1.1, SHEET METAL SHALL BE PER AWS D1.3.

4. CONCRETE ANCHORS
HILTI KWIK BOLT – TZ ANCHORS INSTALLATION AND SPECIAL INSPECTION PER ICC-ES 1917
DIAMETER 1/2"
DRILLED HOLE DEPTH 2-3/4"
EFFECTIVE EMBEDMENT 2"

5. SPECIAL INSPECTION SHALL BE REQUIRED FOR THE FOLLOWING TYPES OF WORK.
FIELD WELDING
POST-INSTALLED CONCRETE ANCHORS

6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. THE STRUCTURAL ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES OR INCONSISTENCIES.

7. IF ANY ERRORS OR OMISSIONS APPEAR IN THESE DRAWINGS, SPECIFICATIONS, OR OTHER DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OR CIVIL ENGINEER IN WRITING OF SUCH OMISSION OR ERROR BEFORE PROCEEDING WITH THE WORK.

8. NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NOTES AND DETAILS ON DRAWINGS AND THESE GENERAL NOTES AND TYPICAL DETAILS ARE IN CONFLICT WITH THE PROJECT SPECIFICATIONS, THE MOST STRINGENT SHALL APPLY. CONDITIONS NOT SPECIFICALLY SHOWN SHALL BE CONSTRUCTED AS SHOWN FOR SIMILAR WORK, SUBJECT TO REVIEW BY THE CIVIL AND STRUCTURAL ENGINEER.

9. MANUFACTURED MATERIALS SHALL BE APPROVED BY THE CHECKING AGENCY PRIOR TO THEIR USE. ALL REQUIREMENTS OF THOSE APPROVALS SHALL BE FOLLOWED.

10. ALL STRUCTURAL SYSTEMS THAT ARE TO BE COMPOSED OF MANUFACTURED COMPONENTS TO BE FIELD ERECTED SHALL BE APPROVED BY THE CHECKING AGENCY PRIOR TO THEIR USE AND SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE, AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.

11. FRAMING MEMBERS, WHICH ARE NOT DIMENSIONED, SHALL BE EQUALLY SPACED BETWEEN DIMENSIONED POINT OR MEMBERS.

12. COORDINATE THESE STRUCTURAL SUPPORTS WITH MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS AND PROJECT SPECIFICATIONS.

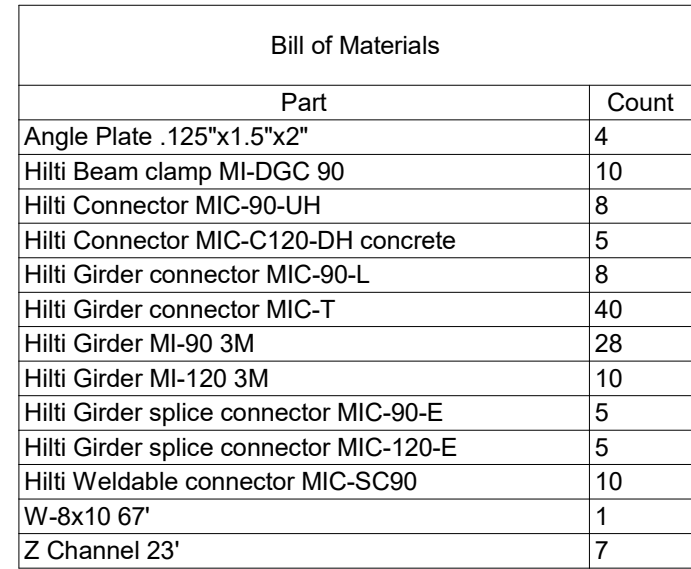
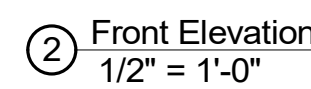
13. THE CONTRACT DOCUMENTS REPRESENT THE FINISHED STRUCTURE; THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. OBSERVATION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.

14. SPECIFICATIONS, CODES, AND STANDARDS NOTED IN THE CONTRACT DOCUMENTS SHALL BE OF THE LATEST APPROVED ISSUE, INCLUDING SUPPLEMENTS, UNLESS OTHERWISE NOTED. MATERIAL SPECIFICATIONS ARE ASTM LATEST EDITION.

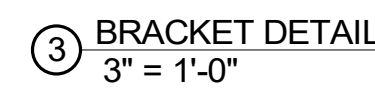
15. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR THE STRUCTURE AND STRUCTURAL COMPONENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

16. CONTRACTOR SHALL SCHEDULE AND COORDINATE ALL MATERIAL TESTING AND SPECIAL INSPECTIONS, TO BE PERFORMED BY AN INDEPENDENT AGENCY APPROVED BY THE OWNER. ALL THIRD PARTY STRUCTURAL TEST, INSPECTION OR OBSERVATION REPORTS REQUIRED BY THESE CONTRACT DOCUMENTS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD WITHIN SEVEN (7) CALENDAR DAYS OF THE DATE OF SAID TEST, INSPECTION OR OBSERVATION. THE ENGINEER OF RECORD SHALL BE NOTIFIED IMMEDIATELY OF ANY DEFICIENCY OR DEVIATION FROM THE CONTRACT DOCUMENTS.

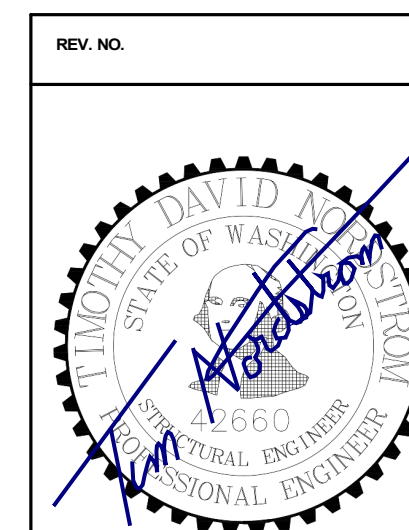
17. CONTRACTORS OPTION:
ALTERNATE CONSTRUCTION METHOD OR MATERIAL MAY BE PROPOSED BY THE CONTRACTOR. ALL PROPOSALS SHALL INCLUDE ENGINEERING DESIGN STAMPED BY A PROFESSIONAL ENGINEER LISCENDED IN THE STATE OF WASHINGTON. WRITTEN APPROVAL BY THE ENGINEER OF RECORD IS REQUIRED PRIOR TO GOING FORWARD WITH ANY ALTERNATE CONSTRUCTION MATERIALS OR DESIGNS.



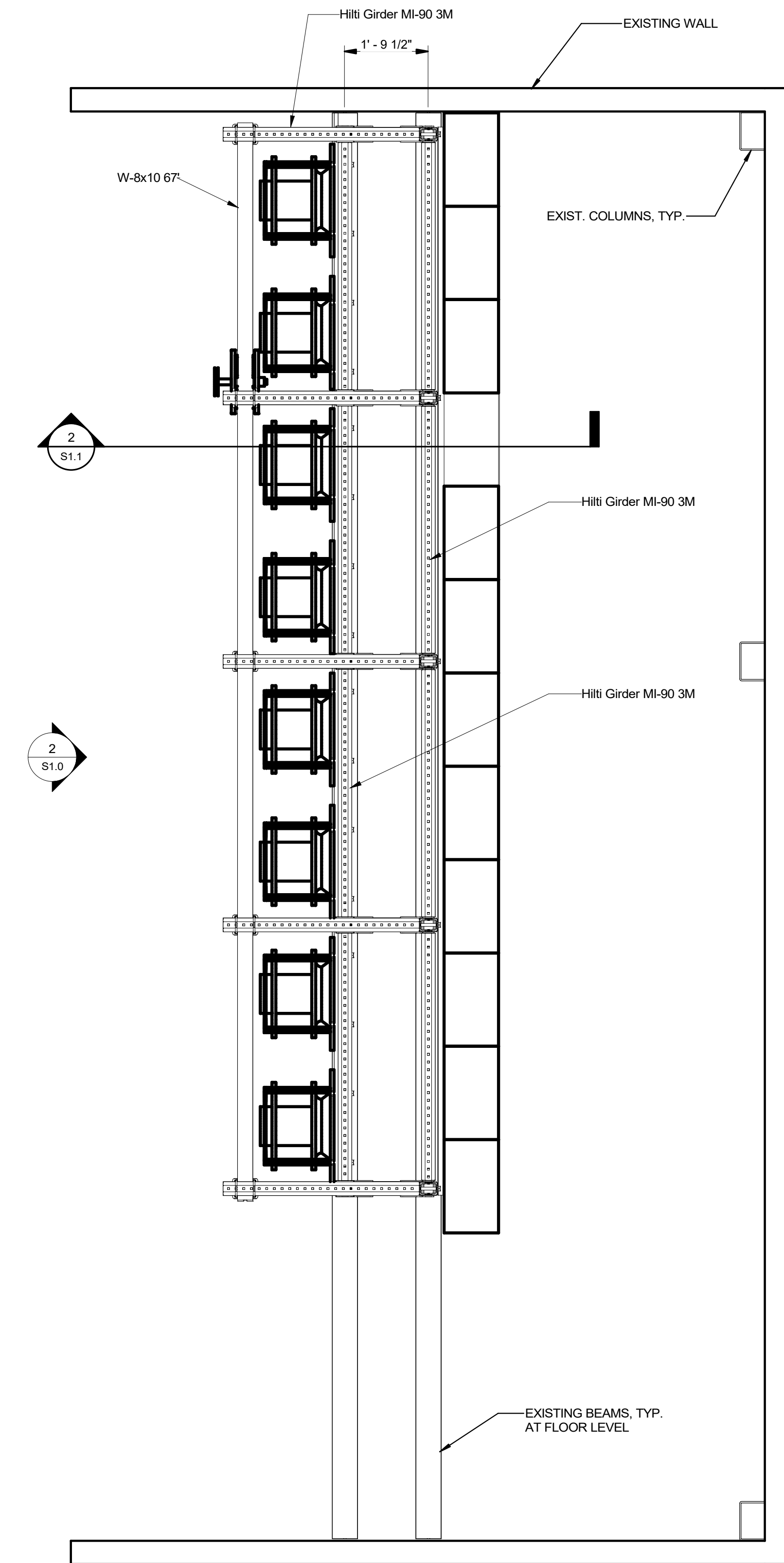
① FAN WALL ISOMETRIC VIEW



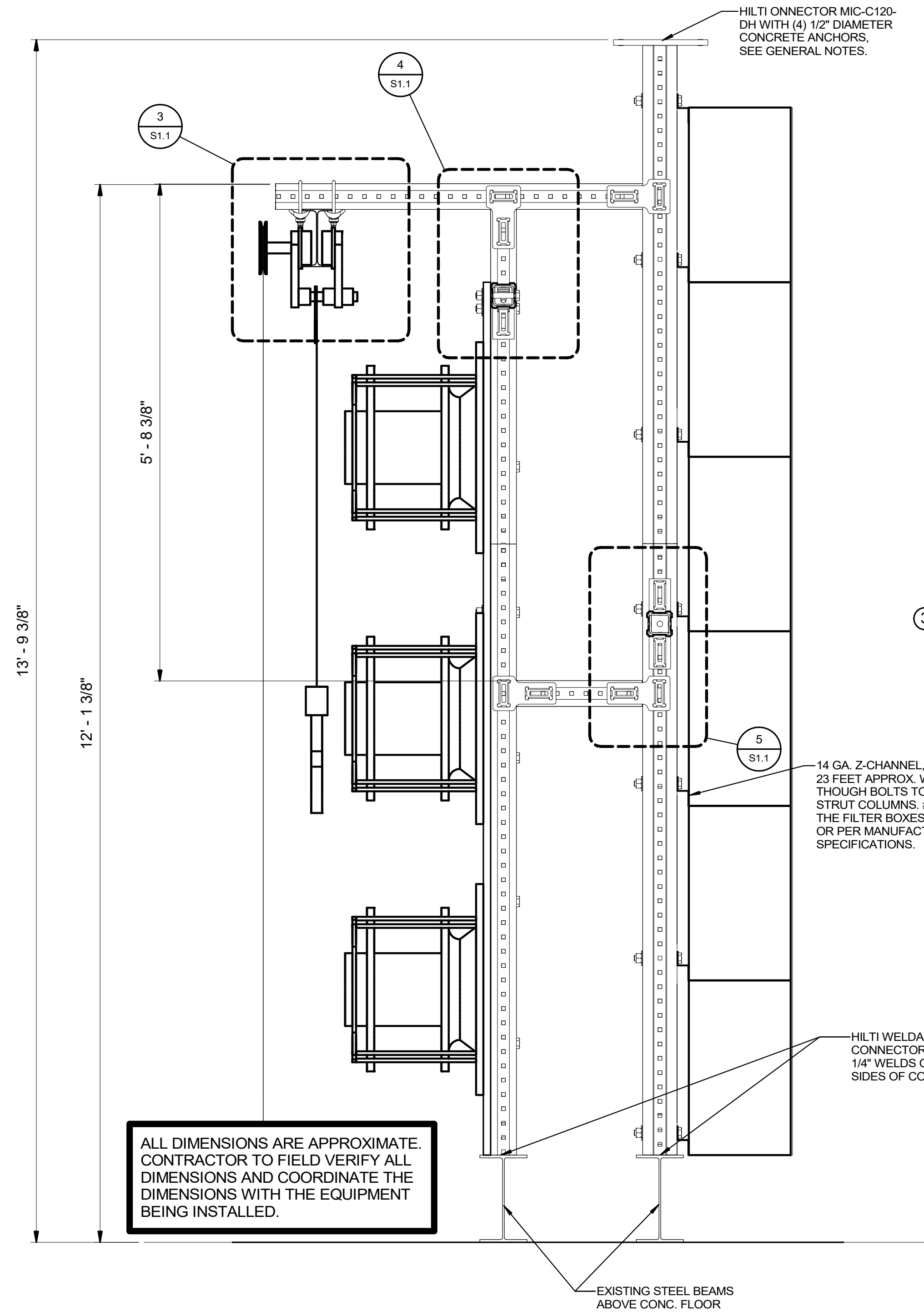
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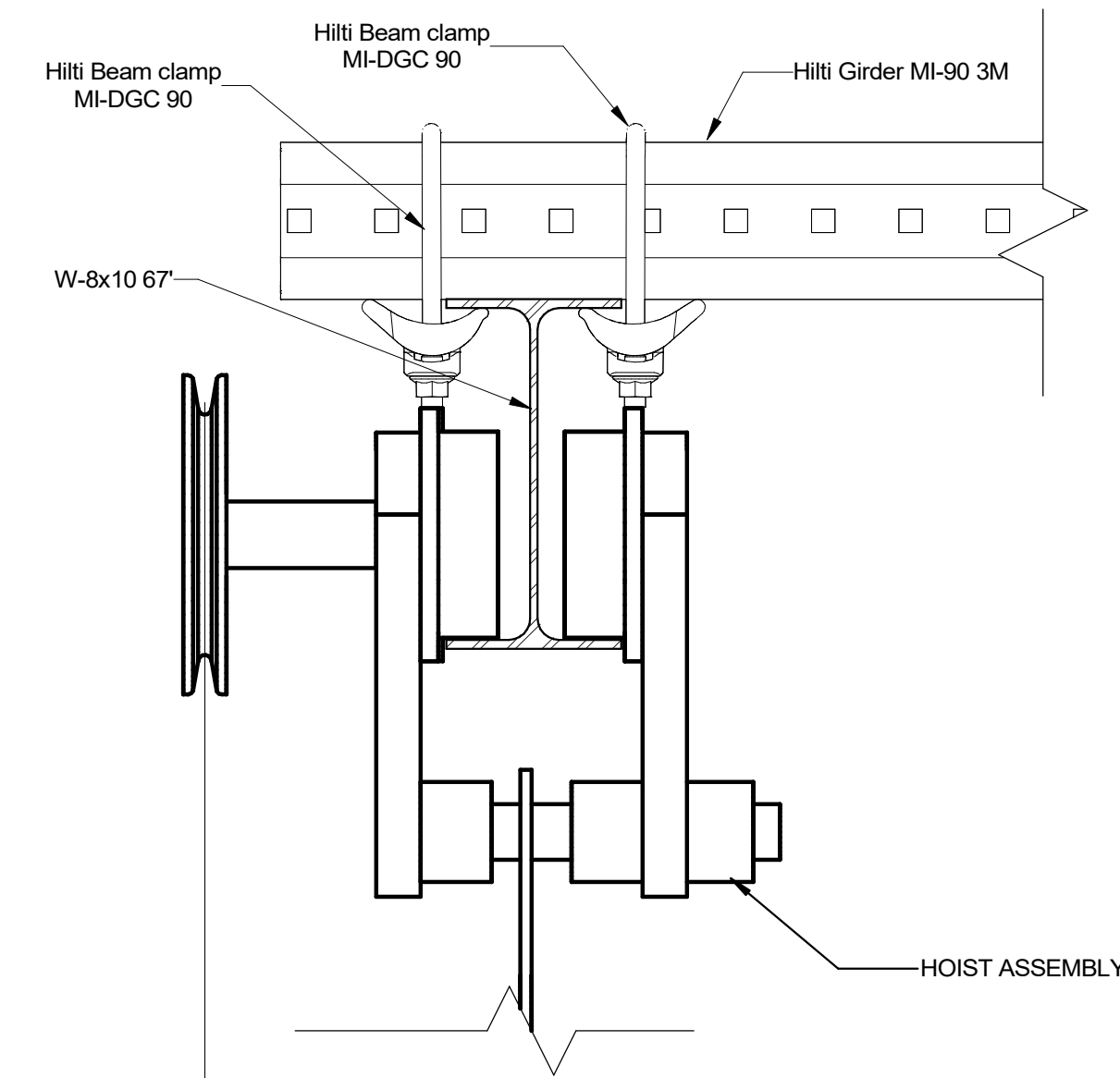
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<p align="center">ADMINISTRATION BUILDING NORTH</p> <p align="center">MECHANICAL ROOM</p> <p align="center">FAN MODIFICATION</p> <p align="center">PLAN & ISOMETRIC VIEW</p>		
REVIEWED 	DESIGNED	DRAWN Author
	Issue Date	STAMPED Approver
APPROVED 	DATE	
	DRAWING NO. 20.5.S1.0	



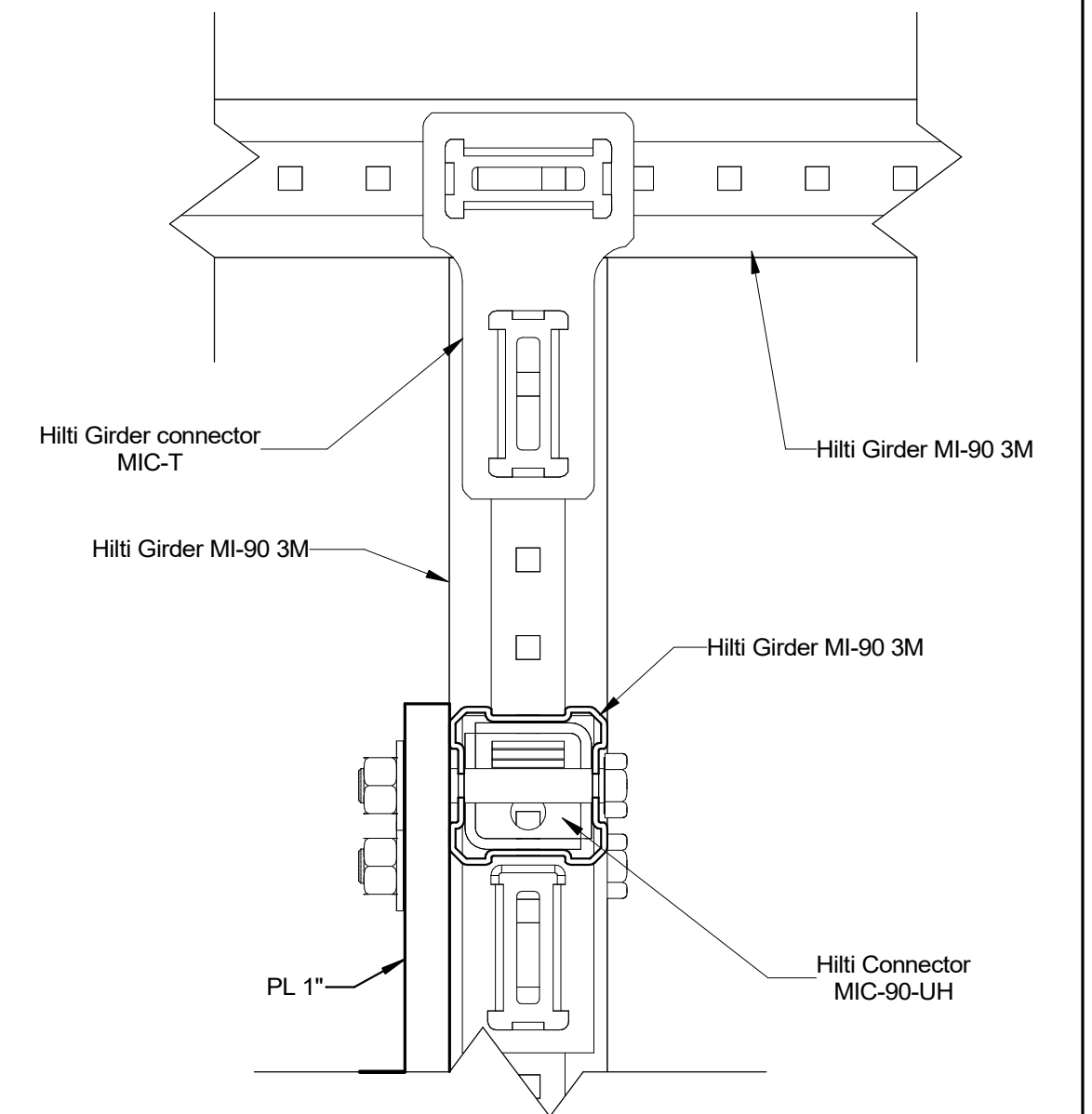
① PLAN
1/2" = 1'-0"



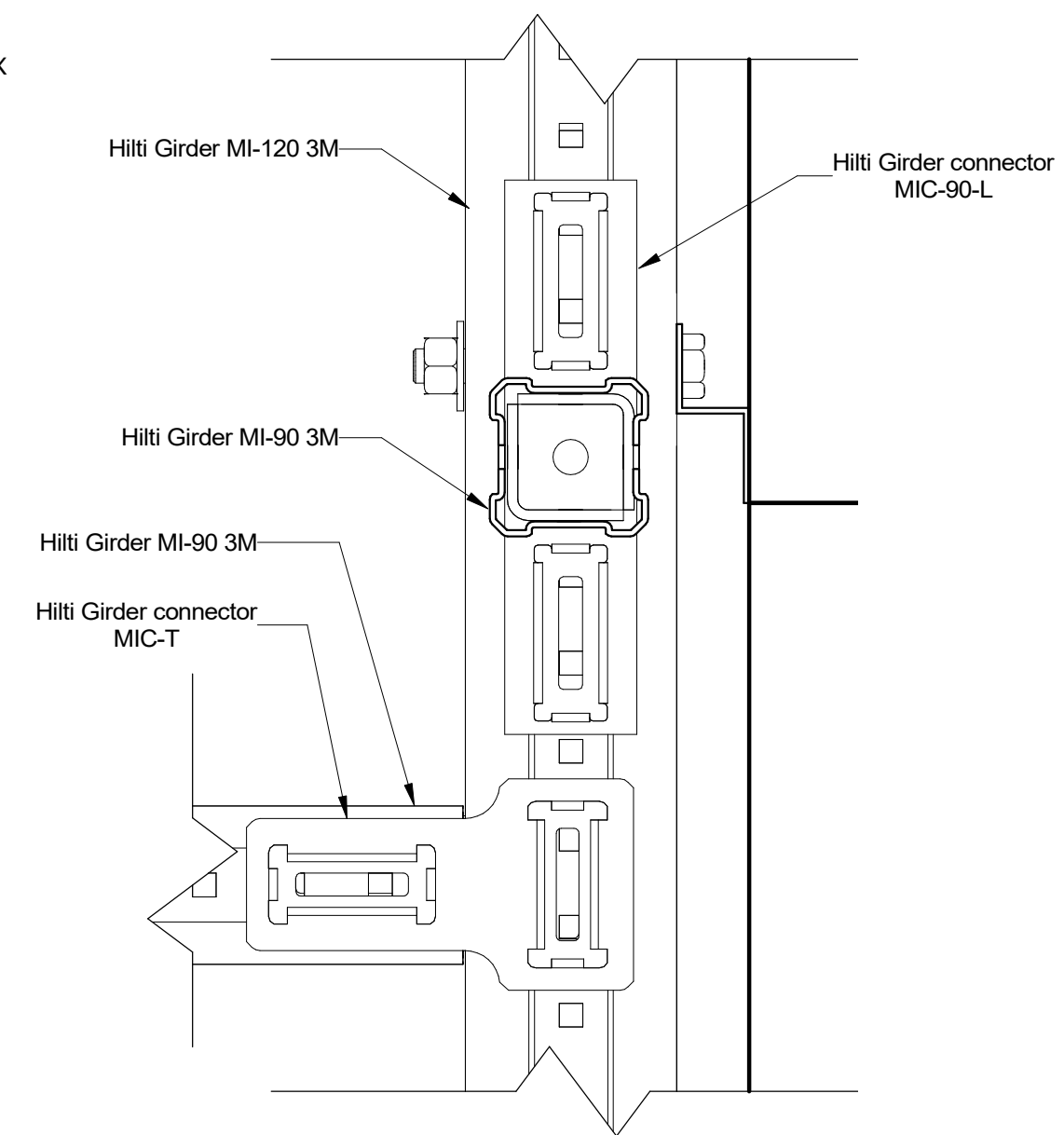
② FRAME SECTION
1" = 1'-0"



③ HOIST DETAIL
3" = 1'-0"



④ CONNECTION DETAIL
3" = 1'-0"



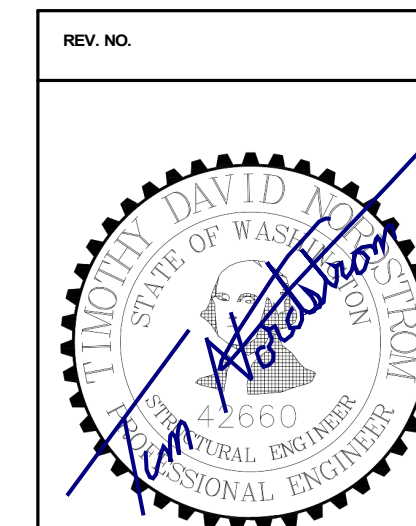
⑤ CENTER CONNECTION DETAIL
3" = 1'-0"

ALL DIMENSIONS ARE APPROXIMATE.
CONTRACTOR TO FIELD VERIFY ALL
DIMENSIONS AND COORDINATE THE
DIMENSIONS WITH THE EQUIPMENT
BEING INSTALLED.

14 GA. Z-CHANNEL, 2x2x2, LENGTH
23 FEET APPROX. W/ 1/2" DIA.
THOUGH BOLTS TO THE HILTI MI
STRUT COLUMNS. #14 SCREWS TO
THE FILTER BOXES. AT 12" O.C. MAX
OR PER MANUFACTURER'S
SPECIFICATIONS.

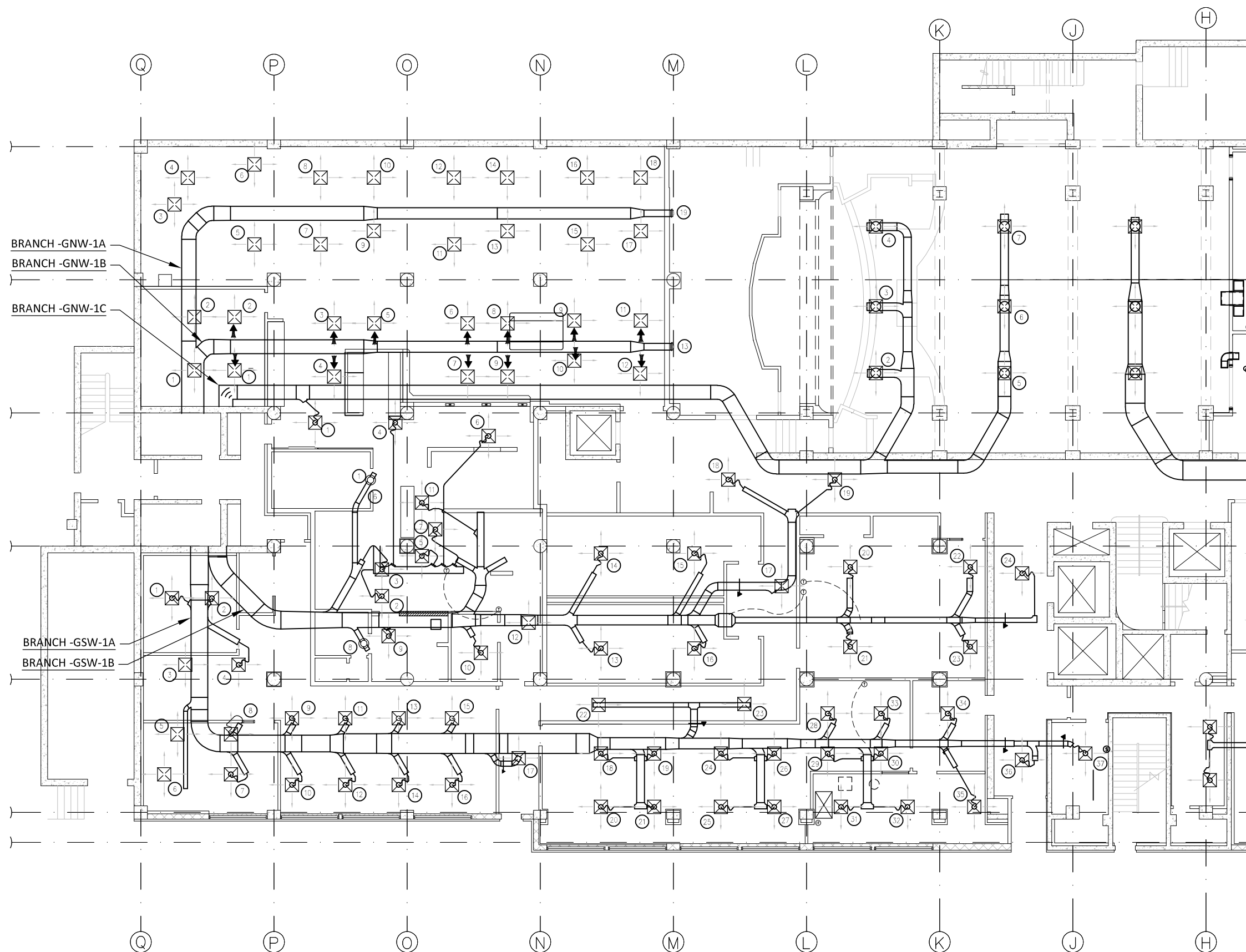
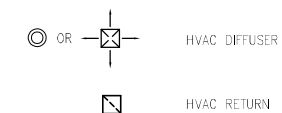
HILTI WELDABLE
CONNECTOR MIC-SC90,
1/4" WELDS ON ALL 4
SIDES OF CONNECTOR

FOR BID



CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION			
ADMINISTRATION BUILDING NORTH MECHANICAL ROOM FAN MODIFICATION PLAN, SECTION & DETAILS			
REVIEWED	DESIGNED	DRAWN	Author
APPROVED	DATE	STAMPED	Approver
DRAWING NO.			20.5.S1.1

LEGEND



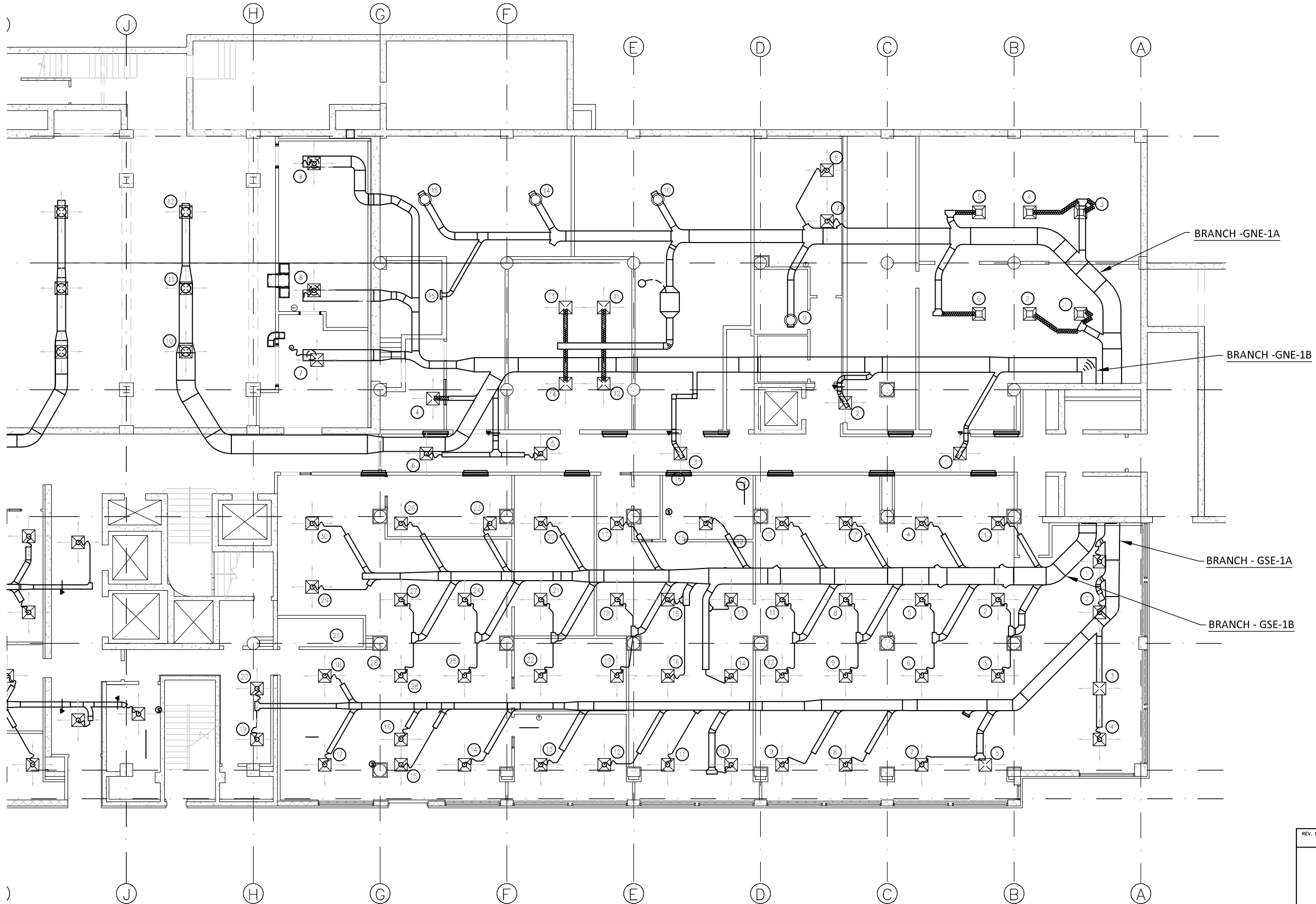
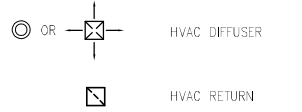
CITY OF TACOMA
DEPARTMENT OF PUBLIC UTILITIES
LIGHT DIVISION

UTILITIES COMPLEX
ADMINISTRATION BUILDING NORTH
GROUND FLOOR WEST HVAC
TESTING, ADJUSTING & BALANCING

REVIEWED	DESIGNED	DRAWN
		KAJ
APPROVED	DATE	STAMPED
	5/6/2020	
	DRAWING NO.	
	20.5.M1.0	

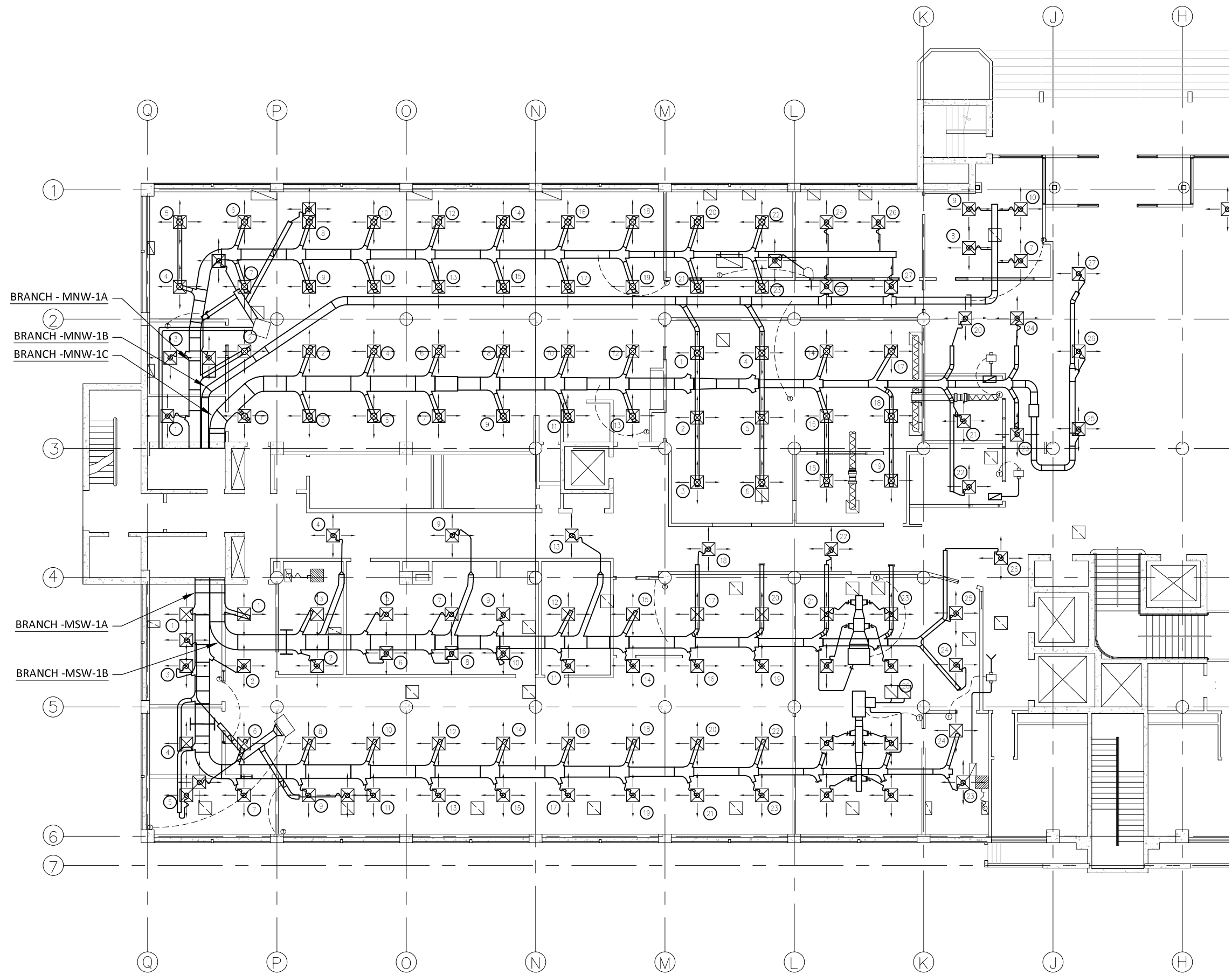
REV. NO. 0

LEGEND



REV. NO. 0

CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION		
UTILITIES COMPLEX ADMINISTRATION BUILDING NORTH GROUND FLOOR EAST HVAC TESTING, ADJUSTING & BALANCING		
REVIEWED	DESIGNED	DRAWN KAJ
	5/6/2020 DATE	STAMPED
APPROVED	DRAWING NO. 20.5.M1.1	



LEGEND

○ OR □ HVAC DIFFUSER

□ HVAC RETURN

BRANCH - MNW-1A

BRANCH - MNW-1B

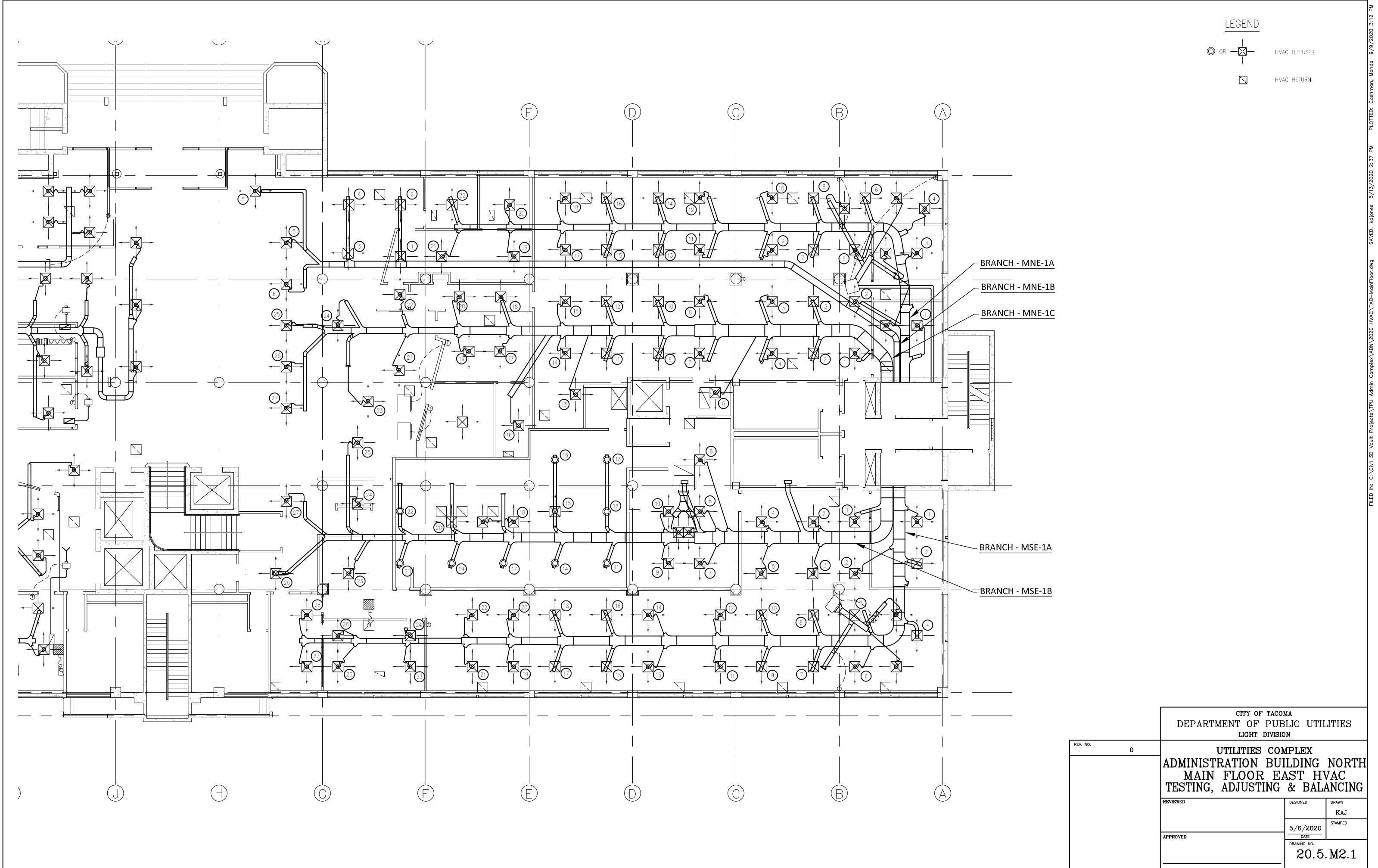
BRANCH - MNW-1C

BRANCH - MSW-1A

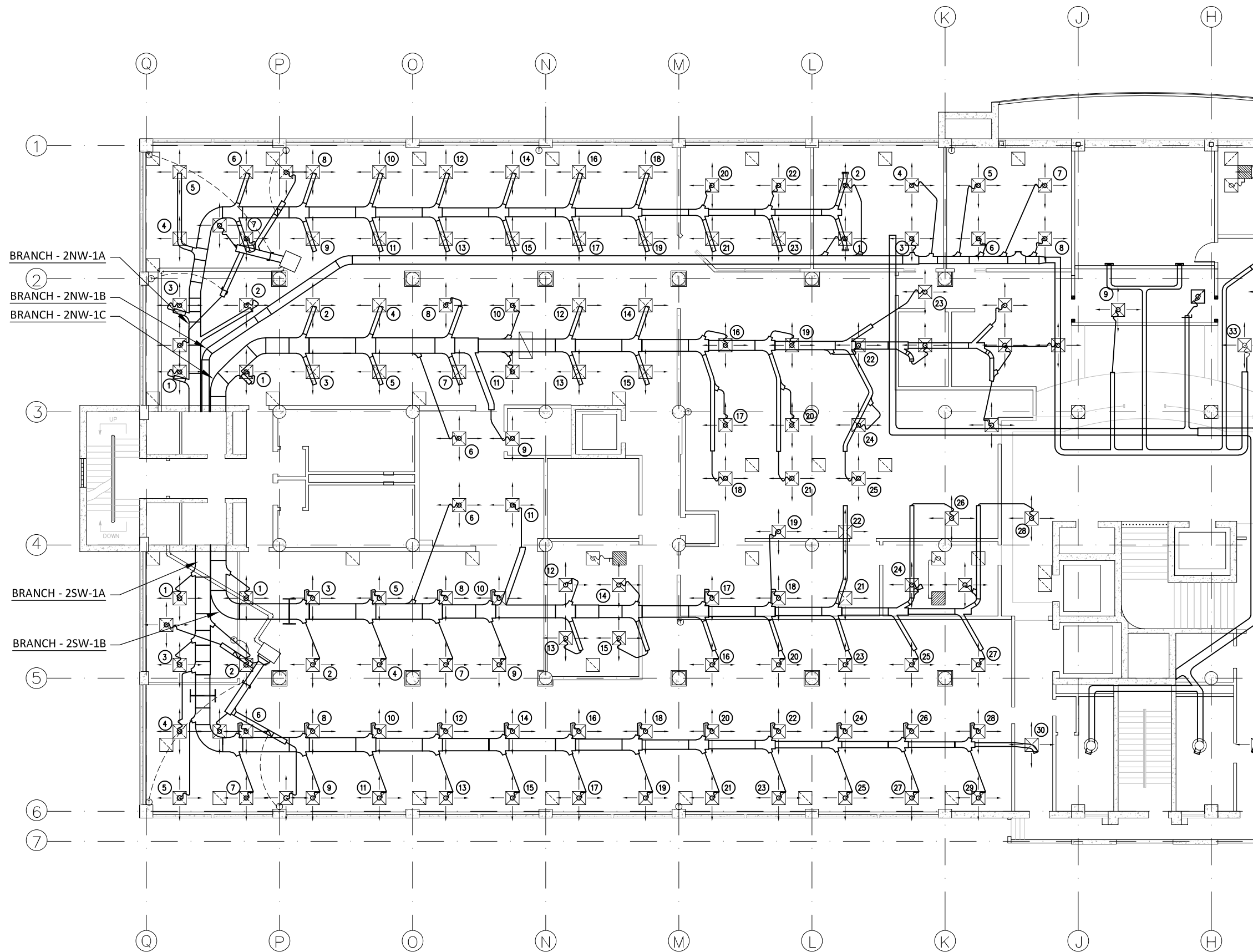
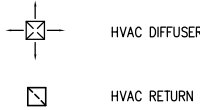
BRANCH - MSW-1B

CITY OF TACOMA DEPARTMENT OF PUBLIC UTILITIES LIGHT DIVISION		
UTILITIES COMPLEX ADMINISTRATION BUILDING NORTH MAIN FLOOR WEST HVAC TESTING, ADJUSTING & BALANCING		
REVIEWED	DESIGNED	DRAWN
	5/6/2020	KAJ
APPROVED	DATE	STAMPED
DRAWING NO. 20.5.M2.0		

REV. NO.	0
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LEGEND



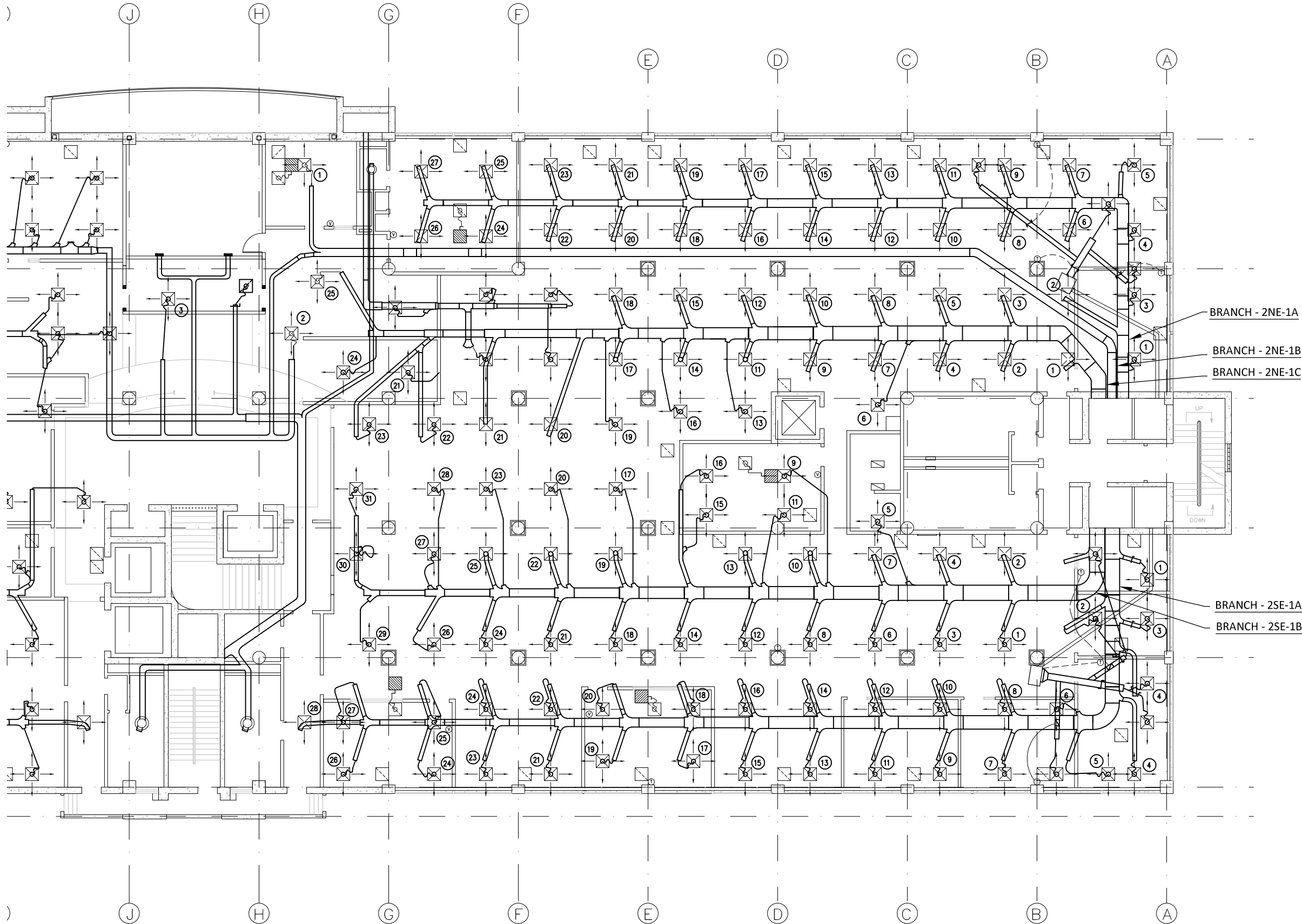
CITY OF TACOMA
DEPARTMENT OF PUBLIC UTILITIES
LIGHT DIVISION

UTILITIES COMPLEX
ADMINISTRATION BUILDING NORTH
SECOND FLOOR WEST HVAC
TESTING, ADJUSTING & BALANCING

REVIEWED	DESIGNED	DRAWN
	5/6/2020	KAJ
APPROVED	DATE	STAMPED
	20.5.M3.0	

LEGEND

- HVAC DIFFUSER
- HVAC RETURN



BRANCH - 2NE-1A

BRANCH - 2NE-1B

BRANCH - 2NE-1C

BRANCH - 2SE-1A

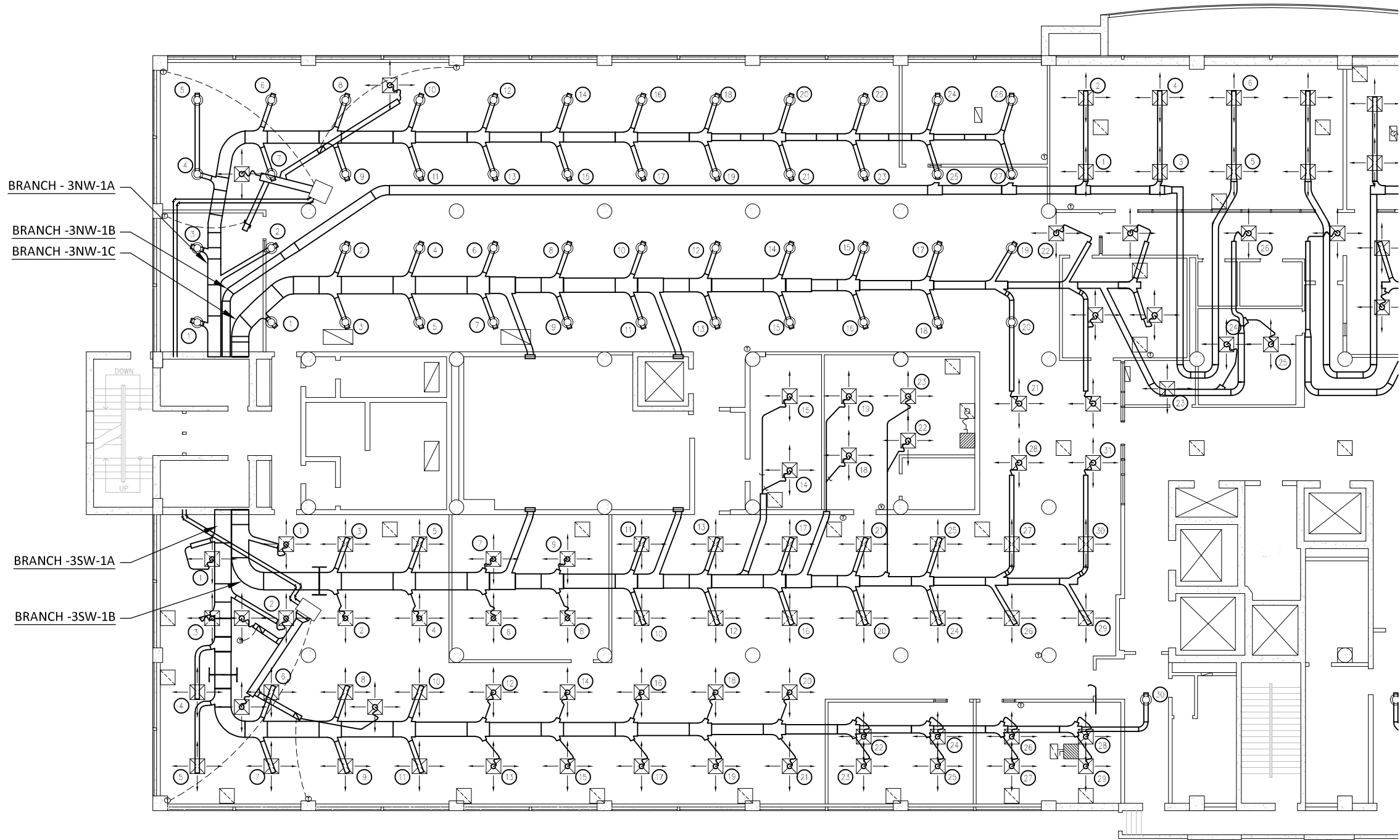
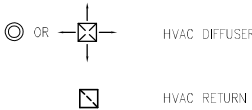
BRANCH - 2SE-1B

CITY OF TACOMA
DEPARTMENT OF PUBLIC UTILITIES
LIGHT DIVISION

UTILITIES COMPLEX
ADMINISTRATION BUILDING NORTH
SECOND FLOOR EAST HVAC
TESTING, ADJUSTING & BALANCING

REVIEWED	DESIGNED	DRAWN
		KAJ
APPROVED	DATE	STAMPED
	5/6/2020	
	DRAWING NO.	20.5.M3.1

LEGEND



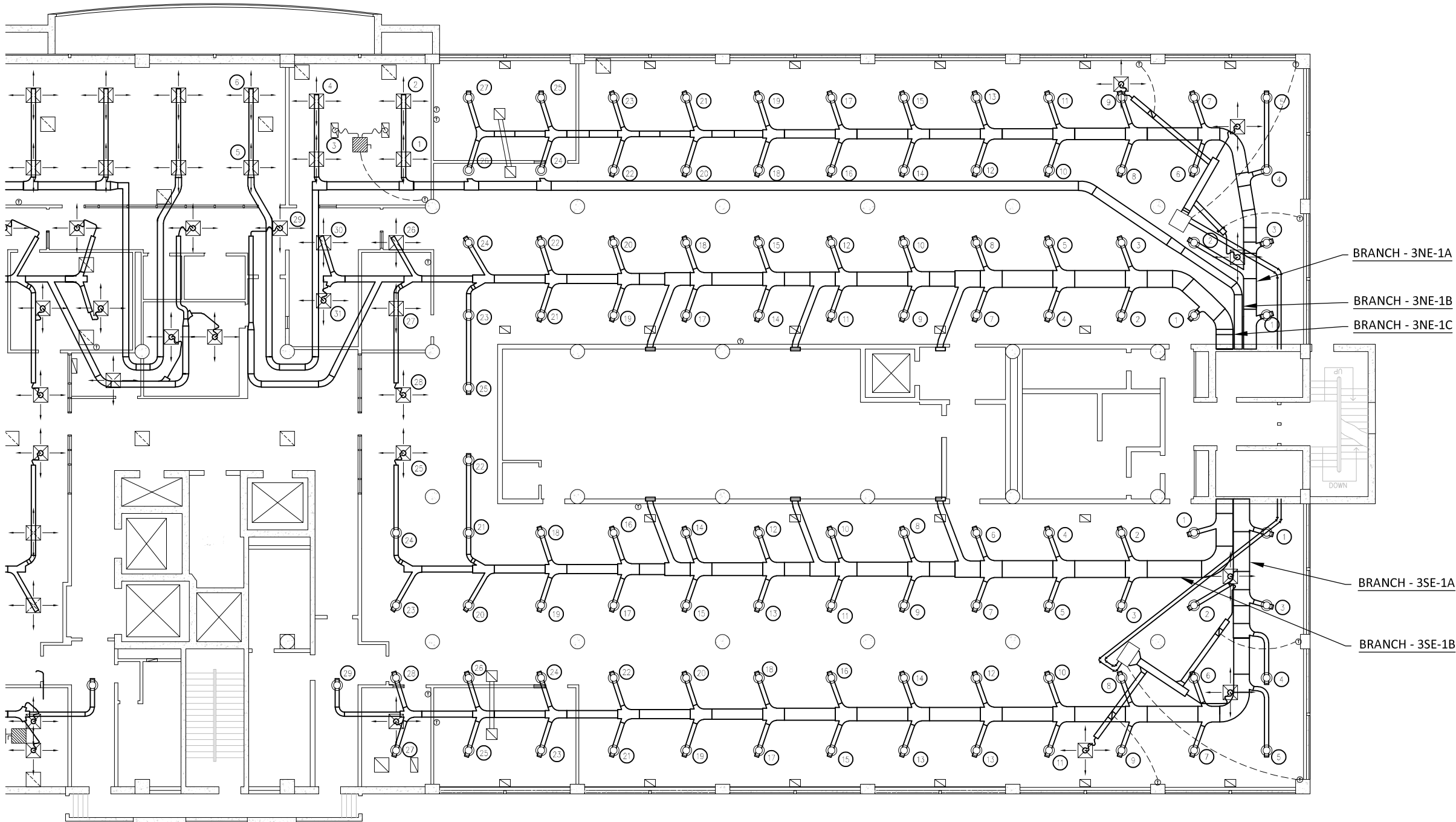
CITY OF TACOMA
DEPARTMENT OF PUBLIC UTILITIES
LIGHT DIVISION

UTILITIES COMPLEX
ADMINISTRATION BUILDING NORTH
THIRD FLOOR WEST HVAC
TESTING, ADJUSTING & BALANCING

REVIEWED	DESIGNED	DRAWN
	5/6/2020	KAJ
APPROVED	DATE	STAMPED
	20.5.M4.0	

LEGEND

○ OR ⊠ HVAC DIFFUSER
⊠ HVAC RETURN

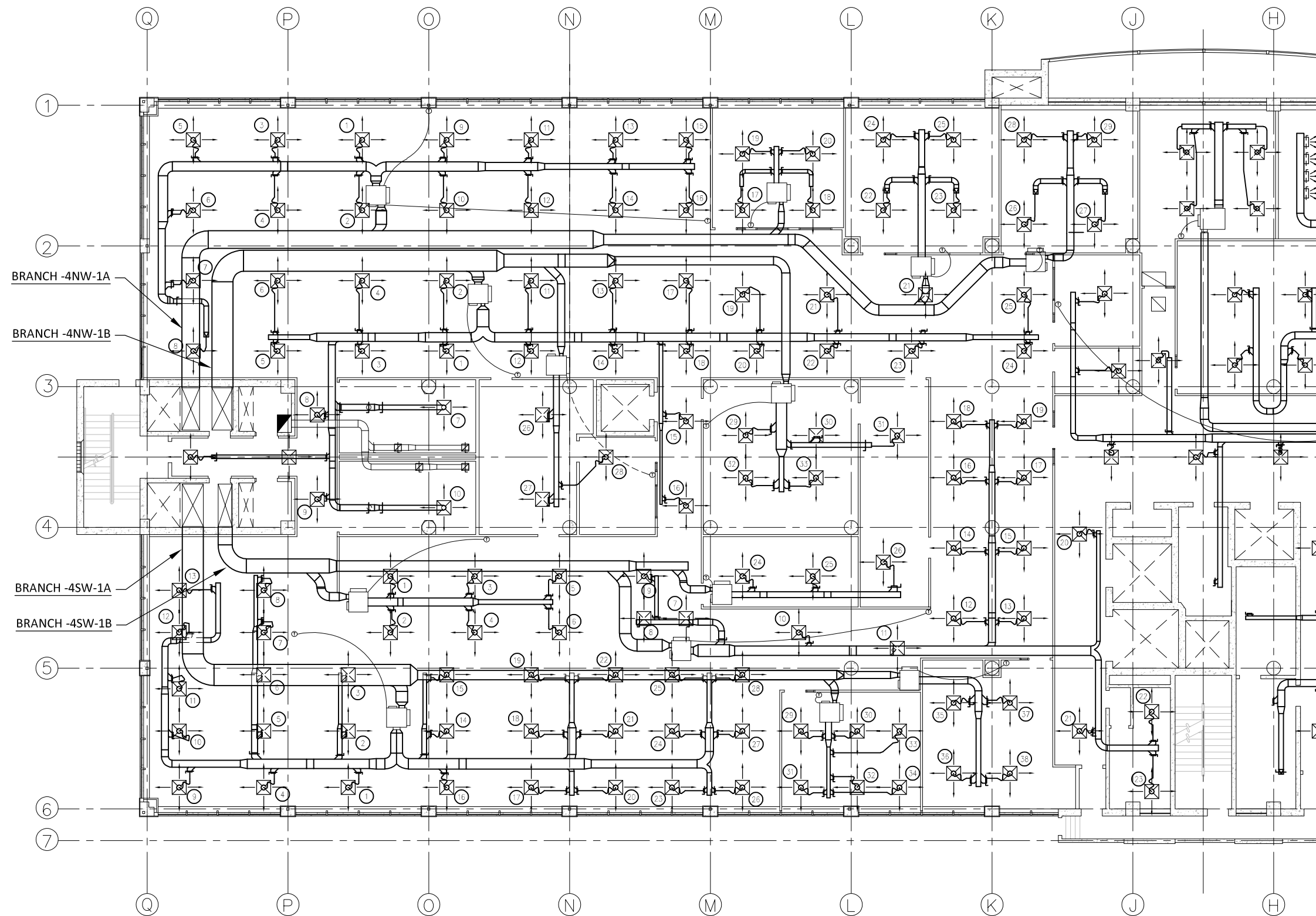
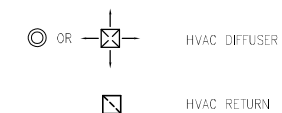


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REVIEWED		DESIGNED	DRAWN
		5/6/2020	KAJ
APPROVED		DATE	STAMPED
		DRAWING NO.	20.5.M4.1

CITY OF TACOMA
DEPARTMENT OF PUBLIC UTILITIES
LIGHT DIVISION

UTILITIES COMPLEX
ADMINISTRATION BUILDING NORTH
THIRD FLOOR EAST HVAC
TESTING, ADJUSTING & BALANCING

LEGEND



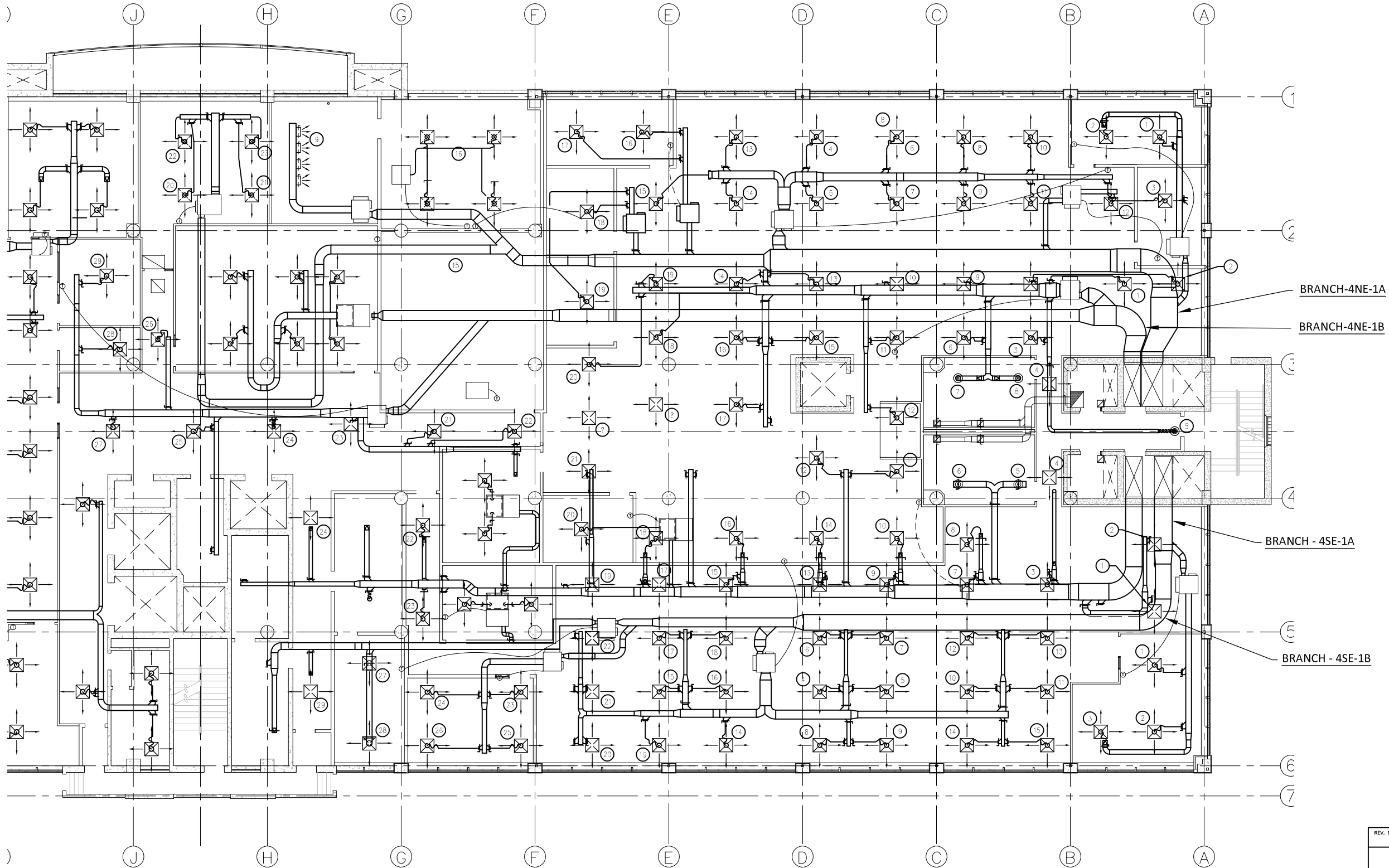
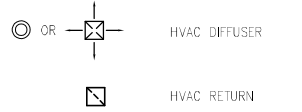
CITY OF TACOMA
DEPARTMENT OF PUBLIC UTILITIES
LIGHT DIVISION

UTILITIES COMPLEX
ADMINISTRATION BUILDING NORTH
FOURTH FLOOR WEST HVAC
TESTING, ADJUSTING & BALANCING

DESIGNED	DRAWN
5/6/2020	KAJ
DATE	STAMPED
DRAWING NO.	20.5.M5.0

REV. NO. 0

LEGEND



CITY OF TACOMA
DEPARTMENT OF PUBLIC UTILITIES
LIGHT DIVISION

UTILITIES COMPLEX
ADMINISTRATION BUILDING NORTH
FOURTH FLOOR EAST HVAC
TESTING, ADJUSTING & BALANCING

REVIEWED	DESIGNED	DRAWN
		KAJ
APPROVED	DATE	STAMPED
	5/6/2020	
	DRAWING NO.	
	20.5.M5.1	

REV. NO. 0